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# THE KNOWLEDGE LEVELS AND HEALTH BELIEFS OF VOCATIONAL SCHOOL OF HEALTH SERVICES STUDENTS ABOUT HUMAN PAPILLOMA VIRUS (HPV) AND VACCINE

## Sağlık Hizmetleri Meslek Yüksekokulu Öğrencilerinin Human Papilloma Virüsü (HPV) ve Aşısına Yönelik Bilgi Düzeyleri ve Sağlık İnançları

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## ABSTRACT

This research was planned to determine the knowledge levels and health beliefs of health services vocational school students about HPV and its vaccine. The research is descriptive. The study was conducted in Vocational School of Health Services of the public university with 275 female students who were attending 1st grade was participated from August 2020 to September 2020. The data were collected using the participant information form and Health Belief Model Scale for Human Papilloma Virus and its Vaccination. Obtained data were interpreted using frequency tables and descriptive statistics in SPSS 24 program. It was determined that students (100.0%) received their HPV knowledge from their school education, (70.5%) did not receive information about the HPV vaccine, students (56.4%) were unaware that HPV was a risk factor for cervical cancer, (98.5%) did not get the HPV vaccine. The seriousness perception scores of those who had HPV knowledge beforehand were significantly higher than those who did not. The results of the current study indicated that students' knowledge about HPV and its vaccination is limited and it will contribute to planning of education programs that will be given to students about HPV.

**Keywords:** Female university students, Health belief model, Human papilloma virus.

## ÖZ

Bu araştırma, sağlık hizmetleri meslek yüksekokulu öğrencilerinin HPV ve aşısına ilişkin bilgi düzeylerini ve sağlık inançlarını belirlemek amacı ile planlanmıştır. Araştırma, tanımlayıcı tiptedir. Ağustos- Ekim 2020 tarihleri arasında bir devlet üniversitesinin sağlık yüksekokulunda yürütülmüştür ve 275 öğrenci katılmıştır. Araştırma verileri "Katılımcı Bilgi Formu" ve "Human Papilloma Virüs Enfeksiyonu ve Aşılamasına ilişkin Sağlık İnanç Modeli Ölçeği" ile toplanmıştır. Elde edilen veriler SPSS 24 programında frekans tabloları ve tanımlayıcı istatistikler kullanılarak yorumlanmıştır. Öğrencilerin tamamının (%100.0) HPV bilgisini okul eğitimlerinden aldığı, %70.5'inin HPV aşısı hakkında bilgi almadığı, %56.4'ünün HPV'nin serviks kanseri risk faktörü olduğunu bilmediği, %98.5'inin ise HPV aşısı yaptırmadığı belirlenmiştir. HPV ile ilgili bilgi sahibi olanların, bilgi sahibi olmayanlara göre ölçek puanlarının daha yüksek olduğu belirlenmiştir. Bu çalışmada öğrencilerin HPV ve aşısı ile ilgili bilgilerinin sınırlı olduğu bulunmuştur. Bu sonuçların öğrencilere HPV ile ilgili verilecek eğitim programlarının planlanmasına katkı sağlayacağı düşünülmektedir.

**Anahtar kelimeler**: Human papilloma virüs aşısı, Kız üniversite öğrencileri, Sağlık inanç modeli.

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## INTRODUCTION

Human Papilloma Virus (HPV) is the most common sexually transmitted disease. Although HPV is responsible for almost all cervical cancers, it is the etiological factor for, respectively, 91% of anal cancers, 75% of vaginal cancers, 69% of vulvar cancers, 63% of penile cancers, and 60% of ovarian cancers (Centers for Disease Control & Prevention [CDC], 2019, Şahin, Özerdoğan, & Duran, 2020). Cervical cancer is the most important type of gynecological malignancies that can be prevented by early diagnosis with a screening test. Prevention of the cervical cancer is as important as the diagnosis. There is a prophylactic vaccine for HPV to reduce mortality and morbidity rates in HPV and HPV -related diseases. Prophylactic HPV vaccine is the most effective primary prevention method against cervical cancer. There are three vaccines approved by the US Food and Drug Administration (FDA) to protect against HPV. These are in the form of bivalent (2vHPV), quadrivalent (4vHPV) and 9-valent (9vHPV) vaccines and are protective against 90% of genital warts (Kessler, 2017). While 2vHPV vaccine (Cervarix®) is against to HPV 16-18, 4vHPV vaccine (Gardasil®) is against to HPV 6, 11, 16, 18; and lastly 9vHPV vaccine (Gardasil 9®) is against to HPV 6,11, 16, 18, 31, 33, 45, 52, 58 (Burlamaqui et al., 2017). These vaccines are included in the national vaccination programme in many countries. However, these vaccines are not included in Turkey national vaccination programme and implementation of these vaccines depends on individuals/families and they are charged. Markowitz et al., (2014) recommend HPV vaccine for children around 10-11 years old and also recommend HPV vaccine for females aged 13 to 26 years and males aged 13 to 21 years who have never been vaccinated or who have not finished the 3-dose series HPV vaccines work best if administered before exposure to HPV. HPV vaccines do not treat HPV infection or HPV-related diseases such as cancer. For this reason, the World Health Organization (WHO) recommends vaccination of girls between the ages of 9 and 14, most of whom have not started sexual activity (World Health Organization [WHO], 2020a). No pre-vaccination test (Pap test or HPV test) is recommended to determine the eligibility of HPV vaccination (Saslow et al., 2020). The most important factor in the transmission of HPV infection is sexual intercourse and the number of spouses and the age of catching infection are important. The age of first sexual intercourse is very important in HPV infection and malignant lesions that will develop later (Khan, Buksh, Rehman, & Saleem, 2016). The decrease in the age of first sexual intercourse, the choice of multiple sexual partners, the increase of risky behaviors such as smoking and having unprotected sexual intercourse in adolescents cause an increase in the risk of HPV in this age group (Patil, Patil,

Ganla, & Durgawale, 2020; Şahin et al., 2020. İşgüder et al., (2017) conducted a study in a vocational school of health services in Turkey and they found that the students' knowledge level about HPV and vaccine is insufficient. In addition to this, Dağ et al., (2015) indicates that nurse students had insufficient knowledge about HPV and its vaccine before the training about the HPV was given.

According to the Health Belief Model (HBM), what is important is that individuals protect and improves their health before they become ill, while they are still healthy. HBM is an effective guide in explaining and measuring the patient's compliance to treatment, what motivates or prevents the patient in many health problems. HBM argues that individual's health behaviors will be affected by their beliefs, values and attitudes. If these beliefs and attitudes, which are seen as problems, are detected, the most accurate and reliable health education or treatment methods can be applied for the individual (Gözüm & Çapık, 2014; Guvenc, Seven, & Akyuz, 2016). For this reason, the current study was planned in order to determine the knowledge levels and health beliefs of vocational school of health services students about HPV and vaccine and to develop suggestions in the fields in line with the results.

## MATERIALS AND METHODS

### Ethical Aspect of the Study

The current study was approved by Gümüşhane University Scientific Research and Publication Ethics Committee with number (2020/5).

### Population and Sample

The study was conducted in Karamanoğlu Mehmetbey University, Vocational School of Health Services and 1468 female students who were attending 1$^{st}$ grade were participated. Questionnaire forms were applied to all students who accepted the research without the sample selection.

### Data Collection Tools

The data were collected using the participant information form and Health Belief Model Scale for Human Papilloma Virus and its Vaccination. Obtained data were interpreted using frequency tables and descriptive statistics in SPSS 24 program.

**Participant Information Form**

The "Participant Information Form" consists of 29 questions about the socio-demographic characteristics of the participants and their knowledge level about HPV and vaccine. This form consists of a questionnaire that includes various socio-demographic characteristics of the participants such as age, parents' education and employment status, HPV infection and HPV vaccination status, information sources, and the reason of being vaccinated.

**Statistical Analysis**

Statistical analyses were carried out using SPSS (IBM SPSS Statistics 20) package program. Frequency tables and descriptive statistics were used in the interpretation of the findings. Non-parametric methods were used for the measurement values that do not fit the normal distribution. In line with non-parametric methods, in comparing the measurement values of two independent groups, the "Mann-Whitney U" test (Z-table value) was used, and in comparing the measurement values of three or more independent groups, the "Kruskal-Wallis H" test ($\chi^2$-table value) method was used. The relationship between two qualitative variables was examined using “Fisher-Exact” or “Pearson-$\chi^2$” cross tables according to the predicted value levels.

**Health Belief Model Scale for Human Papilloma Virus and its Vaccination**

Kim (2012) developed Health Belief Model Scale for Human Papilloma Virus and its Vaccination (HBMS-HPVV). Guvenc et al., (2016) conducted a study for finding of HBMS-HPVV’s reliability and validity in Turkey and they found that it is reliable and validity. The last version of HBMS-HPVV has 14 scales and 4 subscales. Subscales include “perceived severity (items 6-9), perceived barriers (items 10-13 and 15), perceived benefits (items 1-3), and perceived susceptibility (items 4 and 5). Guvenc et al., (2016) describes subscales and scales and they say that benefits include first three items; “HPV vaccine can prevent genital warts and genital cancer”, “HPV vaccine can prevent cervical cancer (for boys, in future sexual partners)”, and “I trust the safety and efficacy of the HPV vaccine”. Susceptibility includes 4$^{th}$ and 5$^{th}$ items which are “Likelihood of getting genital warts is high if they are not vaccinated against HPV”, and “Likelihood of getting cancer is high (girls, cervical cancer; boys, anal or penile cancer) if they are not vaccinated against HPV”. Severity includes 6$^{th}$ 7$^{th}$ 8$^{th}$ and 9$^{th}$ items which are “HPV infection is a serious disease that can disturb school life”, “HPV infection can cause death”, “HPV infection would threaten a relationship with my

boyfriend, husband, or partner", and "The thought of HPV infection scares me". Barriers include items from 10th to 14th which are "I doubt the safety and efficacy of the vaccine", "I have difficulty deciding on the earliest age for HPV vaccination", "HPV vaccination increases sexual curiosity or causes earlier exposure to sexual intercourse", "HPV vaccination is expensive", and "Possible side effects of HPV vaccination make me worry". "The items of subscales have 4-point Likert-type response choices ranging from 1 (not at all) to 4 (very much)" (Guvenc et al., 2016).

## RESULTS

**Table 1.** Distribution of Findings Relating to the Students

| Variable (N=275) | n | % |
|---|---|---|
| **Ages**[$\overline{X} \pm$ S.S.→20.62±1.45 (year)] | | |
| <20 | 55 | 20.0 |
| 20-21 | 164 | 59.6 |
| ≥22 | 56 | 20.4 |
| **Marital Status** | | |
| Married | 8 | 2.9 |
| Single | 267 | 97.1 |
| **Mothers' Employment Status** | | |
| Employment | 50 | 18.2 |
| Non-employment | 222 | 80.7 |
| Retired | 3 | 1.1 |
| **Fathers' Employment Status** | | |
| Employment | 192 | 69.8 |
| Non-employment | 57 | 20.7 |
| Retired | 18 | 6.5 |
| Death | 6 | 2.3 |
| Do not have a contact | 2 | 0.7 |
| **Mothers' Education Level** | | |
| Illiterate | 25 | 9.1 |
| Primary | 173 | 62.9 |
| Secondary | 44 | 16.0 |
| High School | 27 | 9.8 |
| University | 6 | 2.2 |
| **Fathers' Education Level** | | |
| Illiterate | 5 | 1.8 |
| Primary | 128 | 46.5 |
| Secondary | 60 | 21.8 |
| High School | 59 | 21.5 |
| University | 23 | 8.4 |
| **Types of Family** | | |
| Nuclear family | 221 | 80.4 |
| Extended Family | 46 | 16.7 |
| Single parent family | 8 | 2.9 |
| **Residence status** | | |
| Live with family | 28 | 10.2 |
| Shared dormitory | 221 | 80.4 |
| Living alone | 5 | 1.8 |
| Shared house | 21 | 7.6 |

The average age of the students was determined to be 20.62±1.45 (years), and 164 (59.6%) of them were between the ages of 20 and 21. It was determined that 267 students (97.1%) were single, 222 (80.7%) had non-working mothers, and 192 (69.8%) had working fathers. Additionally, it was determined that 173 students (62.9%) mothers were primary school graduates, 128 (46.5%) students' fathers were primary school graduates, 221 (80.4%) had nuclear families, and 221 (80.4%) had stayed in dormitories in the university.

**Table 2**. Distribution of Findings Relating to the Students

| Variable (N=275) | n | % |
|---|---|---|
| **Longest Residency Place** | | |
| Metropolis | 68 | 24.7 |
| Province | 58 | 21.1 |
| District | 84 | 30.6 |
| Village/Small town | 65 | 23.6 |
| **Smoking Status** | | |
| Yes | 48 | 17.5 |
| No | 227 | 82.5 |
| **Hearing HPV Before** | | |
| Yes | 180 | 65.5 |
| No | 95 | 34.5 |
| **Getting HPV Information Before** | | |
| Yes | 108 | 39.3 |
| No | 167 | 60.7 |
| **Sources of Information on HPV *** | | |
| School education | 108 | 100.0 |
| Peers | 11 | 10.2 |
| Social media | 54 | 50.0 |
| Health staff | 18 | 16.7 |
| Family | 4 | 3.7 |
| **Getting HPV Vaccine Before** | | |
| Yes | 81 | 29.5 |
| No | 194 | 70.5 |
| **Sources of Information on HPV Vaccine*** | | |
| School education | 74 | 91.4 |
| Peers | 12 | 14.8 |
| Social media | 31 | 38.3 |
| Health staff | 21 | 25.9 |
| Family | 4 | 4.9 |
| **HPV Infection Transmission Routes** | | |
| Sexual contact | 172 | 62.5 |
| Blood | 12 | 4.4 |
| Toilet | 2 | 0.7 |
| Do not know | 89 | 32.4 |
| **Can HPV Cause a Cervical Cancer?** | | |
| Yes | 120 | 43.6 |
| No | 155 | 56.4 |
| **HPV Vaccination Status** | | |
| Yes | 4 | 1.5 |
| No | 271 | 98.5 |
| **I have an intention to have the vaccine** | | |
| Yes | 53 | 19.6 |
| No | 55 | 20.3 |
| Indecisive | 163 | 60.1 |

* Multiple responses were provided to the question, and the percentages were gotten according to the total number of samples on a row basis.

It was determined that the longest residency place of 84 students (30.6%) was the district, 227 (82.5%) never smoked, 180 (65.5%) had heard about HPV previously, and 167 (60.7%) had not received HPV information beforehand. It was determined that 108 students (100.0%) received their HPV knowledge from their school education, 194 (70.5%) did not receive information about the HPV vaccine, 74 students (91.4%) received this information from their school education, and 172 (62.5%) believed that HPV infection was sexually transmitted. It was determined that 155 students (56.4%) were unaware that HPV was a risk factor for cervical cancer, 271 (98.5%) did not get the HPV vaccine, and 163 (60.1%) were indecisive about getting the HPV vaccine.

**Table 3.** Distribution of Findings Relating to the Students

| Variable (N=275) | n | % |
|---|---|---|
| **The Reason of not Vaccinated HPV*** | | |
| The vaccine is expensive | 13 | 6.0 |
| Do not know anything about the vaccine | 218 | 100.0 |
| Concern for vaccine side effect | 4 | 1.8 |
| Doubt of vaccine safety | 43 | 19.7 |
| Do not need to vaccine | 7 | 3.2 |
| **The Reason of being Vaccinated HPV *** | | |
| If the vaccine is free | 37 | 17.0 |
| If HPV cause cervical cancer | 115 | 52.8 |
| If the vaccine is mandatory | 78 | 35.8 |
| If most people will vaccinate | 17 | 7.8 |
| If I have a knowledge about vaccine | 176 | 80.7 |
| **People who can be vaccinated against HPV** | | |
| Female | 48 | 17.5 |
| Both male and female | 104 | 37.8 |
| Do not know | 123 | 44.7 |
| **The best age for the HPV vaccine** | | |
| 0-10 | 3 | 1.1 |
| 11-26 | 73 | 26.5 |
| 27-40 | 35 | 12.8 |
| Do not know | 164 | 59.6 |
| **Prevention of HPV*** | | |
| Monogamous sex life | 135 | 49.1 |
| Use of condom | 93 | 33.8 |
| Pay attention to genital hygiene | 136 | 49.5 |
| Routine Pap-Smear test | 178 | 64.7 |
| Vaccination | 125 | 45.5 |
| **Getting education about STD**** | | |
| Yes | 180 | 65.5 |
| No | 95 | 34.5 |
| **Getting sexual health education** | | |
| Yes | 157 | 57.1 |
| No | 118 | 42.9 |

| | | |
|---|---|---|
| **Where did you get the sexual health education*** | | |
| School education | 157 | 100.0 |
| Peers | 15 | 9.6 |
| Social media | 44 | 28.0 |
| Health staff | 31 | 19.7 |
| Family | 14 | 8.9 |
| **Talking about sexual health education in family?** | | |
| Informs/talks about sexual health education | 29 | 10.5 |
| Information about sexual health education is not talked too much | 46 | 89.5 |

* Multiple responses were provided to the question, and the percentages were gotten according to the total number of samples on a row basis.** STD (Sexually Transmitted Disease)

It has been determined that 218 students (100.0%) did not get the HPV vaccine due to a lack of sufficient knowledge about the vaccine, 176 (80.7%) will get HPV vaccine if they have knowledge about the vaccine, and 123 (44.7%) did not know the people who could be administered for the HPV vaccine. It has been determined 164 students (59.6%) did not know the optimal age range for HPV vaccination, 178 (64.7%) believed that routine Pap-Smear test should be performed to prevent HPV, and 180 (65.5%) had not received training on sexually transmitted infections. It was determined that 157 students (57.1%) received sexual health information/education, 157 (100.0%) received information about sexual health from their school education, and 246 (89.5%) of them did not discuss issues related to sexuality much with their families.

**Table 4.** Distribution of the findings related to the scale

| **Variable (N=275)** | | **Mean** | **S.D.** | **Median** | **Min.** | **Max.** |
|---|---|---|---|---|---|---|
| **Health Belief Model Scale for Human Papilloma Virus and its' Vaccination** | *Perceived Severity* | 2.86 | 0.67 | 3.0 | 1.0 | 4.0 |
| | *Perceived Barriers* | 2.25 | 0.54 | 2.2 | 1.0 | 4.0 |
| | *Perceived Benefit* | 2.49 | 0.62 | 2.7 | 1.0 | 4.0 |
| | *Perceived Susceptibility* | 2.49 | 0.70 | 2.5 | 1.0 | 4.0 |

The table contains information about the responses provided by students to the scales.

**Table 5**. Examination of the reliability coefficient related to the scales

| **Variable (N=275)** | | **Number of Items** | **Cronbach-α Coefficient** |
|---|---|---|---|
| **Health Belief Model Scale for Human Papilloma Virus and its' Vaccination** | *Perceived Severity* | *4* | *0.771* |
| | *Perceived Barrier* | *5* | *0.754* |
| | *Perceived Barrier* | 3 | 0.796 |
| | *Perceived Susceptibility* | 2 | 0.716 |

It was determined that the students' responses to the scales were at reliable level.

**Table 6**. Examining the Relationship between Previous HPV Knowledge and Participants' Characteristics

| **Getting HPV Knowledge** | **Yes (n=108)** | | **No (n=167)** | | **Statistical Analysis*** |
|---|---|---|---|---|---|
| **Variable** | **n** | **%** | **n** | **%** | **Probability** |
| **Marital Status** | | | | | |
| Married | 4 | 3.7 | 4 | 2.4 | p=0.716 |
| Single | 104 | 96.3 | 163 | 97.6 | |

| | | | | | |
|---|---|---|---|---|---|
| **Mothers' educational level** | | | | | |
| Illiterate | 9 | 8.3 | 16 | 9.6 | |
| Primary | 72 | 66.7 | 101 | 60.4 | $\chi^2$=3.125 |
| Secondary | 14 | 13.0 | 30 | 18.0 | p=0.537 |
| High School | 12 | 11.1 | 15 | 9.0 | |
| University | 1 | 0.9 | 5 | 3.0 | |
| **Fathers' educational level** | | | | | |
| Illiterate | 4 | 3.7 | 1 | 0.6 | |
| Primary | 53 | 49.1 | 75 | 44.8 | $\chi^2$=5.421 |
| Secondary | 19 | 17.6 | 41 | 24.6 | p=0.247 |
| High School | 24 | 22.2 | 35 | 21.0 | |
| University | 8 | 7.4 | 15 | 9.0 | |
| **Types of Family** | | | | | |
| Nuclear family | 85 | 78.7 | 136 | 81.4 | $\chi^2$=1.529 |
| Extended Family | 21 | 19.4 | 25 | 15.0 | p=0.466 |
| Single Parent Family | 2 | 1.9 | 6 | 3.6 | |
| **Residence Status** | | | | | |
| Live with Family | 9 | 8.3 | 19 | 11.4 | |
| Shared Dormitory | 88 | 81.5 | 133 | 79.6 | $\chi^2$=1.537 |
| Living Alone | 3 | 2.8 | 2 | 1.2 | p=0.674 |
| Shared House | 8 | 7.4 | 13 | 7.8 | |
| **Longest Residency Place** | | | | | |
| Metropolis | 26 | 24.1 | 42 | 25.1 | $\chi^2$=0.202 |
| Province | 24 | 22.2 | 34 | 20.4 | p=0.977 |
| District | 32 | 29.6 | 52 | 31.1 | |
| Village/Small town | 26 | 24.1 | 39 | 23.4 | |
| **Smoking Status** | | | | | |
| Yes | 14 | 13.0 | 34 | 20.4 | $\chi^2$=2.003 |
| No | 94 | 87.0 | 133 | 79.6 | p=0.157 |

* The relationship between two qualitative variables was examined using "Fisher-Exact" or "Pearson-$\chi^2$" cross tables according to the predicted value levels.

There is no statistically significant relationship found between the status of receiving HPV knowledge beforehand, marital status, mother education level, father education level, family type, place of residence, period of residency, or smoking status (p> 0.05).

**Table 7.** Examining the Relation between Receiving HPV Knowledge Beforehand and Certain Characteristics

| **HPV knowledge** | **Yes (n=108)** | | **No (n=167)** | | **Statistical Analysis*** |
|---|---|---|---|---|---|
| **Variable** | **n** | **%** | **n** | **%** | **Probability** |
| **Would you like to being vaccinated** | | | | | |
| Yes | 26 | 24.5 | 27 | 16.4 | |
| No | 29 | 27.4 | 26 | 15.8 | $\chi^2$=10.672 |
| Indecisive | 51 | 48.1 | 112 | 67.8 | **p=0.005** |
| **Things that needed for avoiding HPV *** | | | | | |
| Monogamous sex life | 84 | 23.8 | 51 | 16.2 | |
| Use of condom | 59 | 16.7 | 34 | 10.8 | |
| Pay attention to genital hygiene | 80 | 22.7 | 56 | 17.8 | $\chi^2$=41.367 |
| Routine Pap-Smear test | 58 | 16.4 | 120 | 38.2 | **p=0.000** |
| Vaccination | 72 | 20.4 | 53 | 17.0 | |
| **Sexual health in family** | | | | | |
| Informs/talks about sexual health education | 10 | 9.3 | 19 | 11.4 | $\chi^2$=0.128 p=0.721 |
| Information about sexual health education is not talked too much | 98 | 90.7 | 148 | 88.6 | |

* The relationship between two qualitative variables was examined using "Fisher-Exact", "correction for continuity" or "Pearson-$\chi^2$" cross tables according to the predicted value levels.

There was a statistically significant correlation found between the status of receiving HPV information beforehand and the status of desire to get the HPV vaccine ($\chi^2$= 10.672; p = 0.005). It was determined that 29 students (27.4%) who received knowledge of HPV beforehand did not desire to get HPV vaccine, 27 students (16.4%) and 112 students (67.8%) who did not receive information desired to get HPV vaccine or were indecisive. It has been determined that those who predominantly desired to get the HPV vaccine and those who were indecisive had not receive HPV information, and those who did not desire to get the HPV vaccine had received HPV information.

There was a statistically significant correlation found between receiving HPV information beforehand and the actions that should be taken to avoid HPV ($\chi^2$= 41.367; p = 0.000). It was determined that 84 students (23.8%) who had previously received information about HPV believed that monogamous sexual life should be pursued to be protected from HPV, while 120 students (38.2%) who had not received information believed that routine Pap-Smear testing should be performed. It has been determined that those who had HPV knowledge predominantly believed monogamous sex life is necessary for protection from HPV, while those who did not receive information predominantly believe Pap-Smear test is necessary.

There is no statistically significant correlation found between the status of receiving the HPV information beforehand and discussing issues regarding sexual health in the family (p> 0.05).

**Table 8.** Comparison of the Scores of the Health Belief Model For Human Papilloma Virus Infection and Its Vaccination according to the Participant Findings

| **Scale** | | *Perceived Severity* | | *Perceived Barrier* | | *Perceived Benefit* | | *Perceived Susceptibility* | |
|---|---|---|---|---|---|---|---|---|---|
| **Variable (N=275)** | **n** | $\bar{X} \pm S.S.$ | **Median [IQR]** | $\bar{X} \pm S.S.$ | **Median [IQR]** | $\bar{X} \pm S.S.$ | **Median [IQR]** | $\bar{X} \pm S.S.$ | **Median [IQR]** |
| **Marital Status** | | | | | | | | | |
| Married | 8 | 2.56±0.65 | 2.5 [0.7] | 2.25±0.70 | 2.1 [1.2] | 2.58±0.46 | 2.7 [0.8] | 2.44±0.42 | 2.5 [0.9] |
| Single | 267 | 2.87±0.67 | 3.0 [0.8] | 2.25±0.54 | 2.2 [0.6] | 2.48±0.63 | 2.7 [1.0] | 2.49±0.71 | 2.5 [1.0] |
| **Statistical Analysis*** | | Z=-1.499 | | Z=-0.307 | | Z=-0.319 | | Z=-0.214 | |
| **Probability** | | p=0.134 | | p=0.759 | | p=0.750 | | p=0.831 | |
| **Residency Place** | | | | | | | | | |
| Live with Family | 28 | 2.81±0.63 | 2.8 [0.8] | 2.29±0.61 | 2.2 [1.0] | 2.49±0.53 | 2.7 [0.9] | 2.39±0.58 | 2.5 [0.5] |
| Shared Dormitory | 221 | 2.88±0.67 | 3.0 [0.8] | 2.26±0.54 | 2.2 [0.6] | 2.50±0.63 | 2.7 [1.0] | 2.50±0.71 | 2.5 [1.0] |
| Shared House | 21 | 2.71±0.71 | 3.0 [1.3] | 2.06±0.45 | 2.0 [0.6] | 2.23±0.55 | 2.3 [0.7] | 2.36±0.76 | 2.5 [1.0] |
| **Statistical Analysis*** | | $\chi^2$=1.600 | | $\chi^2$=3.455 | | $\chi^2$=3.633 | | $\chi^2$=1.222 | |
| **Probability** | | p=0.449 | | p=0.178 | | p=0.163 | | p=0.543 | |
| **Longest Residency Place** | | | | | | | | | |
| Metropolis | 68 | 2.98±0.65 | 3.0 [1.0] | 2.23±0.45 | 2.2 [0.8] | 2.57±0.62 | 2.7 [0.9] | 2.48±0.76 | 2.5 [1.0] |
| Province | 58 | 2.88±0.56 | 3.0 [0.8] | 2.37±0.61 | 2.3 [0.8] | 2.39±0.59 | 2.3 [1.0] | 2.55±0.58 | 2.5 [1.0] |
| District | 84 | 2.76±0.67 | 2.8 [1.0] | 2.24±0.53 | 2.2 [0.6] | 2.44±0.62 | 2.3 [1.0] | 2.43±0.70 | 2.5 [1.0] |
| Village/Small Town | 65 | 2.86±0.76 | 3.0 [1.1] | 2.18±0.58 | 2.2 [0.8] | 2.55±0.66 | 2.7 [0.7] | 2.50±0.75 | 2.5 [1.0] |
| **Statistical Analysis*** | | $\chi^2$=4.222 | | $\chi^2$=2.633 | | $\chi^2$=5.032 | | $\chi^2$=1.099 | |
| **Probability** | | p=0.238 | | p=0.452 | | p=0.169 | | p=0.777 | |
| **HPV knowledge beforehand** | | | | | | | | | |
| Yes | 108 | 3.00±0.56 | 3.0 [0.5] | 2.24±0.50 | 2.2 [0.8] | 2.61±0.57 | 2.7 [1.0] | 2.69±0.71 | 3.0 [1.0] |
| No | 167 | 2.77±0.71 | 2.8 [1.0] | 2.26±0.57 | 2.2 [0.6] | 2.41±0.64 | 2.3 [1.0] | 2.35±0.66 | 2.5 [1.0] |
| **Statistical Analysis*** | | Z=-2.659 | | Z=-0.339 | | Z=-2.275 | | Z=-3.686 | |
| **Probability** | | **p=0.008** | | p=0.734 | | **p=0.023** | | **p=0.000** | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Interest in Being Vaccinated** | | | | | | | | |
| Yes(1) | 53 | 3.04±0.64 | 3.0 [0.6] | 2.15±0.52 | 2.0 [0.6] | 2.75±0.54 | 3.0 [0.7] | 2.65±0.69 | 2.5 [1.0] |
| No(2) | 55 | 2.72±0.69 | 2.8 [1.0] | 2.42±0.63 | 2.4 [0.8] | 2.21±0.64 | 2.3 [0.7] | 2.28±0.77 | 2.0 [1.0] |
| Undecisive(3) | 163 | 2.84±0.66 | 2.9 [0.8] | 2.24±.49 | 2.2 [0.6] | 2.48±0.60 | 2.7 [1.0] | 2.49±0.66 | 2.3 [1.0] |
| **Statistical Analysis*** | | $\chi^2$=6.348 | | $\chi^2$=8.804 | | $\chi^2$=22.728 | | $\chi^2$=7.827 | |
| **Probability** | | **p=0.042** | | **p=0.012** | | **p=0.000** | | **p=0.020** | |
| **Differences** | | **[1-2]** | | **[1-2]** | | **[1-2.3] [2-3]** | | **[1-2]** | |
| **In Sexual Issues Speaking Family** | | | | | | | | | |
| Yes | 29 | 2.98±0.74 | 3.0 [1.3] | 2.14±0.50 | 2.2 [0.6] | 2.70±0.61 | 2.7 [0.7] | 2.50±0.65 | 2.5 [1.0] |
| No | 246 | 2.85±0.66 | 3.0 [0.8] | 2.26±0.55 | 2.2 [0.6] | 2.46±0.62 | 2.7 [1.0] | 2.48±0.70 | 2.5 [1.0] |
| **Statistical Analysis*** | | Z=-1.352 | | Z=-0.956 | | Z=-1.822 | | Z=-0.023 | |
| **Probability** | | p=0.177 | | p=0.339 | | p=0.068 | | p=0.982 | |

* In the measurement values comparison of two independent groups in data that do not have a normal distribution “Mann-Whitney U” test (Z-table value) statistics. in the comparison of three or more independent group “Kruskal-Wallis H” test statistics ($\chi^2$-table value) was used.

A statistically significant variation has been found in terms of seriousness perception scores according to the status of receiving HPV information beforehand (Z = -2.659; p = 0.008). The seriousness perception scores of those who had HPV knowledge beforehand were significantly higher than those who did not.

A statistically significant variation has been found in terms of perception of benefit scores according to the status of receiving HPV information beforehand (Z = -2.275; p = 0.023). The perception of benefit scores of those who had HPV knowledge beforehand were significantly higher than those who did not.

A statistically significant variation has been found in terms of perception of sensitivity cores according to the status of receiving HPV information beforehand (Z = -2.659; p = 0.008). The perception of sensitivity scores of those who had HPV knowledge beforehand were significantly higher than those who did not.

A statistically significant variation has been found in terms of perception of seriousness scores according to the status of desire to get the HPV vaccine ($\chi^{2nd}$= 6.348; p = 0.042). As a result of the Bonferroni correction pairwise comparisons which were conducted to determine which group was responsible for the significant variation; a significant variation has been found between those who desire to get the HPV vaccine and those who do not. The perception of seriousness scores of those who desire to get the HPV vaccine are significantly higher than those who do not.

A statistically significant variation has been found in terms of perception of obstacle scores according to the status of desire to get the HPV vaccine ($\chi^2$=8.804; p=0.012). As a result of the Bonferroni correction pairwise comparisons which were conducted to determine which group was responsible for the significant variation; a significant variation has been found between those who desire to get the HPV vaccine and those who do not. The perceptions of obstacle scores of those who do not want to have HPV vaccine are significantly higher than those who do.

A statistically significant variation has been found in terms of perception of obstacle scores according to the status of desire to get the HPV vaccine ($\chi^2$=22.728; p=0.000). As a result of the Bonferroni correction pairwise comparisons which were conducted to determine which group was responsible for the significant variation; a significant variation has been found among those who desire to get the HPV vaccine those who do not and who are indecisive. The perception of benefit scores of those who desire to get the HPV vaccine are significantly higher than those who do not desire to and who are indecisive. Similarly, a

significant variation has been found between those who did not desire to get the HPV vaccine and those who were indecisive. The perceptions of benefit scores of those who do not desire to get the HPV vaccine are significantly lower than those who are indecisive.

A statistically significant variation has been found in terms of perception of sensitivity scores according to the status of desire to get the HPV vaccine ($\chi^2$=7.827; p=0.020). As a result of the Bonferroni correction pairwise comparisons, which were conducted to determine which group was responsible for the significant variation; a significant variation has been found between those who desire to get the HPV vaccine and those who do not. The perception of sensitivity scores of those who desire to get HPV vaccine are significantly higher than those who do not.

## DISCUSSION

It is known that more than 99% of the development of cervical cancer is caused by HPV; therefore, awareness of HPV is important for the prevention of cervical cancer (Rerucha, Caro, & Wheeler, 2018). In this study, it was found that 43.6% of the students knew that HPV is a factor that causes cervical cancer, 39.3% of them had knowledge about HPV, and although 29.5% of them had knowledge about HPV vaccine, only 1.5% of them were found to get vaccinated. In other studies which have been conducted with university students in Turkey indicate that vaccination rates were reported to be low (ranging between 0.3% and 1.5%) (Borlu, Gunay, Balci, & Sagiroglu, 2016; Guvenc et al., 2016; Oz et al., 2018; Ozdemir, Akkaya, & Karasahin, 2020). When the studies have been conducted with university students in other countries are examined, it has been determined that 9.5% of female students in China (Liu, Di, & Tao, 2020), 16.5% in Lebanon (Dany, Chidiac, & Nassar, 2015), %26 in Brazil (Biselli-Monteiro, Ferracini, Sarian, & Derchain, 2020), 51% in Greece (Tsagkas et al., 2019), and 72.6 in Switzerland (Jeannot et al., 2019) were vaccinated. Although international organizations make efforts to spread vaccination programs, HPV vaccination rates remain below 50% in many countries (Giuliani et al., 2016). According to the World Health Organization, more than 100 countries have included the HPV vaccine in their national vaccination programs (WHO, 2020b). It has been reported that the inclusion of HPV vaccine in the national vaccination schedule in many countries contributed to the increase in HPV vaccination rates in those countries. The fact that the HPV vaccination rate of the university students participating in the current study was quite low can be explained by the fact that the HPV vaccine is not included in the national vaccination program in Turkey at

the moment, individuals can only get the vaccine administered in health institutions if they can supply it themselves, and the cost of the vaccine is not affordable for the majority of the society.

In our study, no significant relationship was found between the marital status of those who had knowledge about HPV, educational status of participants' parents, the type of family they lived in, the place where they lived for the longest time, the place where they lived while studying at university, and their smoking status. In a study conducted in our country, it was determined that the education, employment status of the parents and the variables did not affect the knowledge of the students about HPV (Guvenc et al., 2016). Our study result is compatible with the literature. It was determined that those who desired to get the HPV vaccine and those who were indecisive about the vaccine had not received HPV information predominantly, and those who did not desire to get the HPV vaccine had received HPV information. It is thought that factors such as the high cost of the vaccine and the fact that the HPV vaccine is not in the vaccination program in our country are the reasons for the students who do not want to be vaccinated despite having knowledge about HPV. In addition, since most of the students (52.8%) in our study stated that they would like to be vaccinated if they were in the cervical cancer risk group, the fact that they did not see themselves in the cervical cancer risk group may also have contributed to their unwillingness to be vaccinated. It is known that the increasing anti-vaccination/vaccine indecisiveness seen in 90% of countries around the world in recent years causes a decrease in vaccination rates, and anti-vaccination attitude is also increasing (Bozkurt, 2018; Gür, 2019). It is thought that even if the students have knowledge about HPV, their anti-vaccination stance/indecisiveness may have been effective in their unwillingness to be vaccinated.

In this study, all of the students who did not get vaccinated stated that they did not get vaccinated because they did not have enough knowledge about the vaccine (100%), while they stated that they wanted to be vaccinated if they had knowledge about the vaccine (80.7%) and if they were in the cervical cancer risk group (52.8%). In a systematic review, it was found that despite the high willingness of the participants to be vaccinated against HPV, the lack of information (40.9% - 76.6%) was the leading cause that made it difficult to achieve the desired level of vaccination rates (Ozdemir et al., 2020). Although the level of knowledge about the HPV vaccine varies according to the countries in the studies conducted, it is still low (Keten et al., 2021; Ortiz, Smith, & Coyne-Beasley, 2019). It is thought that it is important to include the HPV vaccine in the vaccination program, to provide widespread and

continuous HPV health education during the period until the inclusion of the vaccine in the vaccination program, and to ensure that people have access to accurate information. All of the students in the current study (100%) stated that they had information about HPV. While 91.4% of them got information about HPV vaccine from school education, 38.3% of them got it from social media tools. In the studies conducted, while the source of information about health care in developed countries was determined to be health care workers at a high rate and the media (Internet, newspaper and television) at a lower rate (Giambi et al., 2014), in developing countries, as Turkey, it was reported that the source of information about health care was the media at the highest level, and health professionals at a lower level (Balla, Terebessy, Tóth, & Balazs, 2017; Chiang et al., 2016; Ozdemir et al., 2020; Rathfisch, Güngor, Uzun, Keskin & Tencere, 2015). The fact that our study was conducted with the students of the Vocational School of Health can account for the high rate of obtaining HPV knowledge from the education at school. It has been reported that misinformation sources and publications against vaccination in the media may prevent the society from obtaining accurate and reliable information about HPV vaccine (Hanley, Yoshioka, Ito, & Kishi, 2015). For this reason, it is important that the information obtained is taken from the right sources.

In this study, a significant relationship was found between the health belief subscales scores of the participants and their intention to be vaccinated (Table 8). Participants who planned to get HPV vaccine had higher perceived severity (Guvenc et al., 2016; Marlow, Waller, Evans, & Wardle, 2009), higher perceived susceptibility (Grace-Leitch & Shneyderman, 2016; Guvenc et al., 2016; Kim, 2012; Tsagkas et al., 2019) and higher perceived benefits (Kim, 2012; Bennet, Buchanan, & Adams, 2012; Guvenc et al., 2016; Tsagkas et al., 2019) and a lower perceived barriers score (Guvenc et al., 2016; Tsagkas et al., 2019). Our study results are also consistent with these studies showing that higher perceived susceptibility, higher perceived HPV severity, and higher perceived benefits of HPV vaccination are positively associated with the intention for HPV vaccination. A higher perceived barriers score is also consistent with other studies that are negatively associated with the intention to vaccinate (Guvenc et al., 2016; Tsagkas et al., 2019). In this study, a significant relationship was found between the health belief subscales scores of the participants and their intention to be vaccinated (Table 8). It was determined that the students who had knowledge about the HPV vaccine had higher perceived severity, perceived susceptibility and perceived benefit among the health belief model subscales (Table 8). For this reason, providing accurate information about HPV should be planned so that every

individual can widely reach it. Since HPV vaccination is considered appropriate from the age of 9 and the responsibility in this regard lies with the families, informing families and encouraging vaccination, both in terms of country policies and through training, is extremely important in the prevention of cervical cancer.

## CONCLUSION

The results of the current study indicated that students' knowledge about HPV and its vaccination is limited. Although the majority of the participants have heard about HPV before, they did not receive any information about HPV and its vaccine and do not know that HPV is a virus and sexually transmitted disease and causes to cervical cancer. In addition to this, most of the participants undecided about being vaccinated and reason of not being vaccinated is that they have lack of knowledge about HPV and its vaccine. Participants who have knowledge about HPV and its vaccine show higher scores on severity, perceived barriers, perceived benefits, and perceived susceptibility than participants who have lack of information about HPV and its vaccine. For further studies, it is recommended that having knowledge about HPV and its vaccine has a positive effect on health belief.

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