

Knowledge Beliefs and Barriers of Healthcare Workers about Human Papilloma Virus (HPV) and HPV Vaccine

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ABSTRACT

Background/Purpose: HPV vaccine is critical in the primary prevention of HPV infection and related diseases. HPV vaccination alone reduces HPV infection by 70% and cervical cancer by 48%. Healthcare workers are expected to have sufficient knowledge and positive attitudes and behaviours about the HPV vaccine. This study aimed to determine the knowledge level of healthcare workers about HPV and HPV vaccination and their beliefs and barriers towards HPV vaccination.

Methods: In this cross-sectional study, 339 healthcare workers were reached by snowball sampling. Sociodemographic form, 'Human Papilloma Virus Knowledge Scale (HPV-KS)', 'Health Belief Model Scale for Human Papilloma Virus (HPV) and Its Vaccination (HBMS-HPVV)' were applied online.

Results: 254 female (74.9%) and 85 male (25.1%) healthcare workers participated in this study, and 60.5% of the participants were physicians. 94.4% of participants have heard of the HPV vaccine. The most frequently consulted information sources are specialist physicians (57%), social media/TV/Websites (24.4%), and other health workers (23.7%). Twenty-six participants (7.7%) have had at least one dose of the HPV vaccine, and 58% completed three doses. 6.7% of the participants having daughters, and 0.7% of those having sons vaccinated their children against HPV. Women who have had HPV screening ($p=0.016$), HPV positive results ($p=0.033$) and pathological cervical cancer screening results ($p=0.004$), those having 1st-degree relatives or close friends who had HPV vaccine ($p<0.001$), those with fewer years in the job ($p=0.025$) and physicians ($p=0.002$) had HPV vaccine more. HPV-KS total score ($p<0.001$), HBMS-HPVV benefits score ($p<0.001$), and HBMS-HPVV susceptibility score ($p<0.001$) are higher, and barriers score ($p=0.027$) is lower in those who had the HPV vaccine.

Conclusion: Consequently, the knowledge about HPV and its vaccination was found to be sufficient in our study. It has been shown that the perception of benefit, severity and susceptibility is high, and the perception of barriers is moderate. Despite this, vaccine coverage is relatively low in this study group. The vaccine cost and the concerns about the effectiveness of the vaccine appear as important barriers.

Keywords: HPV vaccine, health belief model, healthcare worker, Turkey

Sağlık Çalışanlarında İnsan Papilloma Virüsü (HPV)'ye Yönelik Bilgi Düzeyi ve HPV Aşılmasına Yönelik İnanç ve Bariyerler ÖZET

Amaç: HPV enfeksiyonu ve ilişkili hastalıkların primer korumasında HPV aşısı oldukça önemlidir. HPV aşısı yaptıranın tek başına, HPV enfeksiyonunu %70; serviks kanserini ise %48 oranında azalttığı görülmüştür. Sağlık çalışanlarının HPV aşısı ile ilgili yeterli bilgi düzeyi ve olumlu tutum ve davranışlara sahip olması beklenir. Bu çalışmada HPV ve HPV aşılama konusunda sağlık çalışanlarının bilgi düzeyi ve HPV aşılmasına yönelik inanç ve bariyerlerinin belirlenmesi amaçlanmıştır.

Gereç ve Yöntem: Kesitsel tipteki çalışmamızda kartopu örneklem metodu ile 339 sağlık çalışanına ulaşılmıştır. Sosyodemografik veri formu, 'Human Papilloma Virüsü Bilgi Ölçeği (HPV-BÖ)', 'Human Papillomavirus (HPV) Enfeksiyonu ve Aşılmasına İlişkin Sağlık İnanç Modeli Ölçeği (HPVA-SİMÖ)' online olarak uygulanmıştır.

Bulgular: Çalışmamıza 254 kadın (%74,9) ve 85 erkek (%25,1) sağlık çalışanı katılmıştır ve katılımcıların %60,5'i tabiidir. Çalışmamıza katılan sağlık çalışanlarının %94,4'ü HPV aşısını duymuştur. En sık başvurulan bilgi kaynakları ilgili alanların uzman tabipleri (%57), sosyal medya/TV/Web siteleri (%24,4) ve tabip dışı sağlık çalışanları (%23,7)'dir. 26 katılımcı (%7,7) en az bir doz HPV aşısı yaptırmıştır ve bunların %58'i aşısı 3 doza tamamlamıştır. Kız çocuğu olan katılımcıların %6,7'si kızlarına ve erkek çocuğu olanların %0,7'si oğluna HPV aşısı yaptırmıştır. HPV aşısını, HPV taramasını yaptıran kadınlar ($p=0,016$), HPV tarama sonucu pozitif olanlar ($p=0,033$), serviks kanseri tarama sonucu patolojik olanlar ($p=0,004$), HPV aşısı yaptıran 1. derece akraba veya yakın arkadaşları olanlar ($p<0,001$), meslekte geçirilen yılları daha az olanlar ($p=0,025$) ve tabipler ($p=0,002$) daha fazla yaptırmıştır. HPV aşısı yaptıranlarda HPV-BÖ toplam puanı ($p<0,001$), HPVA-SİMÖ yarar alt ölçek puanı ($p<0,001$) ve duyarlılık alt ölçek puanı ($p<0,001$) daha yüksek bulunurken, engel alt ölçek puanı ($p=0,027$) daha düşük bulunmuştur.

Sonuç: Çalışmamızda HPV ve aşılmasına yönelik bilgi düzeyi yeterli bulunmuş olup; yarar, ciddiyet ve duyarlılık algısının yüksek olduğu, engel algısının ise orta seviyede olduğu gösterilmiştir. Buna rağmen aşı kapsayıcılığı çalışma grubumuzda oldukça düşüktür. Aşı maliyetinin devlet tarafından karşılanması ve aşının etkinliği konusundaki endişeler önemli bir bariyerler olarak karşımıza çıkmaktadır.

Anahtar kelimeler: HPV aşısı, sağlık inanç modeli, sağlık çalışanı, Türkiye

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HPV (Human Papilloma Virus) has approximately 40 subtypes that cause many infections, especially anogenital infections (1). Most people will inevitably encounter HPV at some point in their lives. Low-risk HPV types result in condyloma, while high-risk types can cause cancers of the vagina, vulva, cervix, penis, anus, head, and neck. Cervical cancer caused by high-risk types is one of the most common cancers in women (2). According to the Turkey Cancer Statistics 2017 report, the frequency of cervical cancer in women is 4.3 per 100.000, and it is the 9th most common cancer type in women (3). The incidence of HPV-related cancers (mouth, pharynx, cervix, vulva, vagina, anus) is 5 per 100.000 in women; 1 in 100.000 in men (mouth, pharynx, penis, anus) (3). The HPV vaccine is crucial in the primary prevention of HPV infection and related diseases. The HPV vaccine was first approved by the United States Food and Drug Administration (FDA) in 2006. There are three types of vaccines (2-valent, 4-valent, 9-valent) with proven safety and efficacy against HPV. HPV vaccination alone reduces HPV infection by 70%; It has been found to reduce cervical cancer by 48% (4). There are three types of HPV vaccines in Turkey, but the vaccine cost is not covered by General Health Insurance (GHI) and is not included in the national vaccination programme.

To increase the quality of the health services regarding HPV, health professionals should have good knowledge about risk factors, prevention methods, early diagnosis, screening and treatment services and a positive attitude and behaviour on the subject due to being role models in the general population. Especially since the HPV vaccine is not included in the routine vaccination programme and its cost is not covered by GHI, providing information about the vaccine may be limited, which is often reflected in the practices. However, the attitude regarding that issue is crucial in changing health behaviours. Therefore, behaviour changes will be easier if the beliefs and attitudes about health behaviours are known. Therefore, this study aimed to determine the knowledge of healthcare professionals about HPV and HPV vaccination and their beliefs and barriers towards HPV vaccination.

MATERIALS and METHODS

The study data were collected between 20.07.2022 and 20.08.2022 following the ethics committee permission (Decision no: 75). The minimum sample size was 369, with 40% knowledge level about the HPV vaccine, with a 5% precision and 95% power. No sample selection was applied. Healthcare workers aged 18 and over were

reached using the snowball method, and the forms prepared with the Google Forms application were applied online. Three hundred thirty-nine participants completed the online survey, including the sociodemographic data form, 'Human Papilloma Virus Knowledge Scale' and the 'Health Belief Model Scale for Human Papillomavirus (HPV) Infection and Its Vaccination'.

Human Papilloma Virus Knowledge Scale (HPV-KS) was developed by Waller et al. in 2013 (5). The original form of HPV-KS is composed of 35 questions, but two questions were excluded from the scale because they are incompatible with the Turkish national vaccination program. The Turkish validation study was conducted by Demir, and the Turkish form consists of 33 items. The questions are answered as "yes, no, I don't know". Each correct answer means 1 point, and each wrong answer is 0 points. It consists of 4 sub-dimensions; general HPV information, HPV screening test information, general HPV vaccine information and information about the current HPV vaccination program (6).

Kim developed the Health Belief Model Scale for Human Papilloma Virus and Its Vaccination (HBMS-HPVV) in 2012 (7). The Turkish validity and reliability study was performed by Güvenc et al. (8). The Turkish version of HBMS-HPVV consists of 14 items and four subscales. These are the perceived severity (items 6-9); perceived severity (items 6-9), perceived barriers (items 10-13 and 15), perceived benefits (items 1-3), and perceived susceptibility (items 4 and 5). In addition, it has four items Likert-type response system; 1 "not at all", 2 "somewhat", 3 "quite a lot", and 4 "a lot". A high perceived benefits score indicates that the HPV vaccine is beneficial, and a high perceived severity score suggests that HPV infection is a serious problem. A high perceived barriers score means that vaccination-related barriers are high. A high perceived susceptibility score indicates high susceptibility in this regard.

In statistical analysis, the compatibility of continuous variables with normal distribution was evaluated with the Kolmogorov-Smirnov test. Since the continuous variables were not normally distributed, they were shown as the median (minimum-maximum) value. Categorical data were shown as frequency (percentage). Chi-square test and Mann Whitney U test were used in comparative analyses. Binary logistic regression analysis was used for multivariate analyses. The statistical significance level was accepted as $p < 0.05$.

RESULTS

This study included 254 women (74.9%) and 85 men (25.1%). 72% are married, and 64.3% have at least one child. The median age is 36 (23-64) years. 56.3% of them are graduates of master's degree or higher, 41.3% of university and 2.4% of high school. 60.5% of them are doctors. They are from 48 different provinces, and the highest number of participants are from Niğde (21.5%), Ankara (14.5%) and Istanbul (9.1%).

94.4% of the healthcare professionals participating in the present study have heard about the HPV vaccine. The most frequent sources of information about the HPV vaccine were the specialist physicians (57%), social media/TV/Web sites (24.4%) and non-medical health workers (23.7%). Twenty-six participants (7.7%) received at least one dose of the HPV vaccine (Figure 1), and 58% completed three doses. The rates of at least one dose of vaccination to the children of the participants who have girls (n=147) and boys (n=152) children are shown in Figure 1. The most common reasons for not having the HPV vaccine are; inadequate knowledge about the vaccine (45.3%), the high cost of the vaccine (33.9%), the thought of decreased effectiveness of the vaccine due to their age (9.6%) and no need for the vaccine (8.6%). Of the 81 participants (23.9%) 1st-degree relatives or close friends had the HPV vaccine. In case the vaccine cost is covered by the GHI, their thoughts on getting the HPV vaccine for themselves, their daughters and their sons are presented in Figure 2.

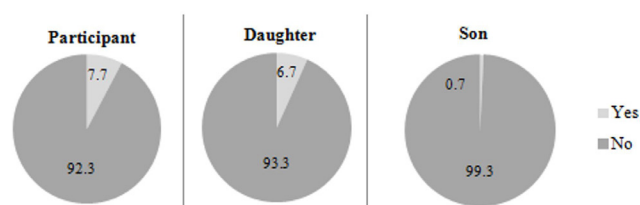


Figure 1. HPV vaccination status of the participants and their children

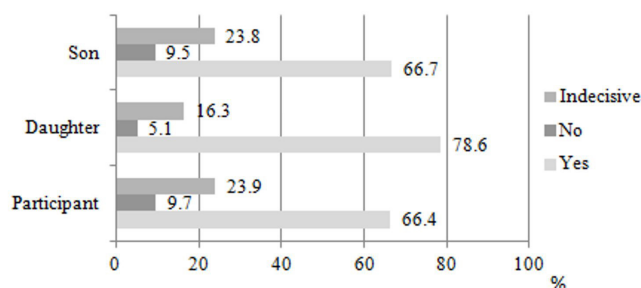


Figure 2. Thoughts of the participants about having HPV vaccine for themselves and their children in the case the cost of HPV vaccine is paid by General Health Insurance

Having HPV screening ($p=0.016$), positive HPV screening results ($p=0.033$), 1st-degree relatives or close friends who had HPV vaccination ($p<0.001$), and pathological cancer screening results ($p=0.004$) were found to increase the HPV vaccination rate. In addition, the rate of HPV vaccination was found to be higher in those with fewer years in the occupation ($p=0.025$) and physicians ($p=0.002$). The univariate analysis results of the affecting factors of the HPV vaccination are presented in Table 1, and the multivariate analysis results are shown in Table 2.

Participants scored the need for education regarding the HPV vaccine as 6 (1-10), and the median score of HPV-KS is 25 (0-32). There is a weak negative correlation between the need for education score and the HPV-KS score ($r=-0.261$, $p<0.001$). General HPV information ($p=0.002$), HPV screening test information ($p=0.005$), general HPV vaccine information ($p=0.001$) and information about the current HPV vaccination program ($p<0.001$) and HPV-KS total ($p<0.001$) scores were higher in those who had HPV vaccine (Table 1).

The median score of the HBMS-HPVV severity, benefits and susceptibility subscales is 3(1-4), and the barriers subscale is 1.8 (1-4). While the HBMS-HPVV benefits subscale score ($p<0.001$) and susceptibility subscale score ($p<0.001$) are higher in those who had the HPV vaccine, the barriers subscale score ($p=0.027$) is lower. The HBMS-HPVV severity score was found as 3.5 (1.75-4) in those who had the vaccine and 3 (1-4) in those who did not ($p=0.073$) (Table 1). The educational need score is 5 (1-10) in those who had the HPV vaccine and 7(1-10) in those who did not ($p=0.096$). HPV vaccination status did not differ significantly according to sex, age, marital status, having children, perceived income status and education level (Table 1).

In the case of the HPV vaccine cost covered by GHI, the intention of getting the HPV vaccine was found to be higher in women ($p=0.028$), those who had cervical cancer screening ($p=0.033$) and HPV screening ($p=0.028$), those who thought that the state should cover the HPV vaccine cost ($p=0.004$)

Table 1. Factors affecting participants' HPV vaccination status				
		HPV Vaccination		p-value
		Yes n (%) [*]	No n (%) [*]	
Age		35 (27-47)	37 (23-64)	0.177 ^{**}
Sex	Female	21 (8.3)	233 (91.7)	0.474 [§]
	Male	5 (5.9)	80 (94.1)	
Marital status	Single	6 (7.8)	71 (92.2)	0.915 [§]
	Married	18 (7.4)	226 (92.6)	
	Divorced	2 (11.8)	15 (88.2)	
	Widow	0 (0.0)	1 (100.0)	
Having child	Yes	11 (5.0)	207 (95.0)	0.015 [§]
	No	15 (12.4)	106 (87.6)	
Perceived income level	Income less than expenses	1 (2.2)	44 (97.8)	0.307 [§]
	Income equal to expenses	14 (8.0)	162 (92.0)	
	Income more than expenses	11 (9.3)	107 (90.7)	
Educational level	High school graduate	0 (0.0)	8 (100.0)	0.080 [§]
	University graduate	6 (4.3)	134 (95.7)	
	Master and above	20 (10.5)	171 (89.5)	
Occupation	Doctor	23 (11.2)	182 (88.8)	0.002 [§]
	Allied health personnel	3 (2.2)	131 (97.8)	
Occupational duration (years)		10 (1-20)	12 (0-38)	0.025 ^{**}
Need for education regarding the HPV vaccine		5 (1-10)	7 (1-10)	0.096 ^{**}
Cervical cancer screening (n=254)	Yes	14 (10.1)	125 (89.9)	0.251 [§]
	No	7 (6.1)	108 (93.9)	
Pathological result of cervical screening (n=139)	Pathologic	2 (66.7)	1 (33.3)	0.004 [§]
	Normal	12 (9.0)	121 (91.0)	
	I don't know	0 (0.0)	3 (100.0)	
HPV screening (n=254)	Yes	13 (13.8)	81 (86.2)	0.017 [§]
	No	8 (5.2)	147 (94.8)	
HPV screening result (n=94)	HPV negative	10 (11.4)	78 (88.6)	0.033 [¥]
	HPV positive	3 (50.0)	3 (50.0)	
HPV vaccination among 1st-degree relatives or close friends	Yes	17 (21.0)	64 (79.0)	<0.001 [§]
	No	9 (3.5)	249 (96.5)	
Cervix cancer diagnosis among 1st-degree relatives or close friends	Yes	2 (7.4)	25 (92.6)	1.000 [¥]
	No	24 (7.7)	288 (92.3)	
HPV-KS total score		28 (16-32)	25 (0-32)	<0.001 ^{**}
HBMS-HPVV-benefits score		4 (2-4)	3 (1-4)	<0.001 ^{**}
HBMS-HPVV-susceptibility score		4 (2-4)	3 (1-4)	<0.001 ^{**}
HBMS-HPVV-severity score		3.5 (1.75-4)	3 (1-4)	0.073 ^{**}
HBMS-HPVV-barriers score		1.6 (1.4-3.2)	2 (1-4)	0.027 ^{**}

^{*}Continuous variables are shown as median (min-max).
^{**}Mann Whitney U test. [§]Chi-square test. [¥]Fisher Exact test
 HPV: Human Papilloma Virus.
 HPV-KS: Human Papilloma Virus Knowledge Scale.
 HBMS-HPVV: Health Belief Model Scale for Human Papilloma Virus and Its Vaccination

Table 2. Multivariate analysis of factors affecting participants' HPV vaccination status		
	OR (95% CI)	p-value*
HPV test positivity	8.12 (0.85-77.39)	0.068
HPV vaccination among 1st-degree relatives or close friends	11.73 (2.03-67.53)	0.006
HBMS-HPVV-susceptibility score	4.51 (1.13-17.94)	0.032

*Backward LR method: variables of age, occupation group, occupational duration, HPV screening result, HPV vaccination among 1st-degree relatives or close friends, cervical cancer screening result, HPV-KS total score, HBMS-HPVV benefits, susceptibility, severity and barriers scores, perceived educational need for HPV vaccine were included. HPV: Human Papilloma Virus, HBMS-HPVV: Health Belief Model Scale for Human Papilloma Virus and Its Vaccination

DISCUSSION

We found HPV vaccine coverage as 7.7%. In a systematic review evaluating population-based studies conducted in Turkey, HPV vaccination rates were shown to vary between 0.3-6% (9). Karasu et al. found the HPV vaccination rate to be 5.2% in their study with nurses, consistent with the present study (10). Considering that nearly half of the participants in the present study conducted with healthcare professionals were physicians, it can be said that the HPV vaccination rate is relatively low.

In the present study, the participants' HPV-KS total score is 25 (0-32). In a population-based study, the mean HPV-KS score was 8.9 ± 2.5 (11). In the same survey, the rate of hearing about the HPV vaccine (55.4%) is far behind the rate in our study (94.4%). These results mean that the awareness and knowledge of the healthcare professionals involved in the present study about the HPV vaccine are reasonable.

Although the HPV vaccination rate is 7.7% in the present study, 66.4% of the participants stated that they intended to be vaccinated if the vaccine cost was covered by GHI, and 23.6% were undecided on this issue. This result shows that most healthcare professionals who do not have the HPV vaccine are willing to be vaccinated. Thus, we can conclude that the HPV vaccine cost is an important barrier to HPV vaccination. Besides, in a study conducted with specialist physicians in Turkey, 91.6% of physicians think that if the vaccination cost decreases, the vaccination rate will increase (12). In a prospective study conducted by Yanikkerem et al. with nurses having daughters between the ages of 9-26, it was observed that only 1.4% of the nurses had their daughters vaccinated following HPV vaccination education. The most important reason for not vaccinating was reported as the vaccination cost and concerns about the efficacy and safety of the vaccine, and one out of every 3 participants stated that they would like to have their daughter vaccinated later (13).

In many countries, the efficacy and safety of the vaccine, side effects, inconsistent and incomplete information about the vaccine, and vaccination costs have been reported as barriers to the administration of the HPV vaccine (14-16). In the review of Özdemir et al. in Turkey, the most common reasons for not having the HPV vaccine are lack of information (40.9-76.6%), concerns about side effects (0.9-64.5%), and vaccine cost (%0.2-49.5) (9). In the present study, the most frequent reasons were similarly insufficient knowledge about the HPV vaccine (45.3%), the high cost of the vaccine (33.9%), and the thought of decreased effectiveness of the vaccine due to age (9.6%). Since there was no upper age limit for including the study, it is seen that one out of every 10 participants did not have the vaccine because the vaccine would not be effective at their age. It has been reported that the vaccine's effectiveness decreases after the age of 26 in the recommendations of the Centers for Disease Control and Prevention (CDC) recommendations regarding the timing of the HPV vaccine (17). The fact that the HPV vaccine has a history of 16 years and low awareness until recently may make this a rational reason for older participants. Still, the low vaccination rate among the participants' children (girls: 6.7%, boys: 0.7%) shows that the relevant initiatives are still insufficient.

In the present study, HPV vaccination rates of participants and their children and the idea of having HPV vaccine for both themselves and their children if the vaccine is free, were higher for women and girls. In the study of Tolunay et al., it was shown that 86% of the physicians thought to have their daughters vaccinated with HPV, but this rate was 25.8% for sons, and the ineffectiveness of the vaccine was the most common reason for both (12). A study conducted with primary healthcare workers showed that 82% of physicians and 75% of nurses did not know that the HPV vaccine is suitable for both men and women (18). In the present study, one out of every 2 participants did not know that the vaccine was licensed for males ages 11-26. In addition, in the case of the vaccine being free, the intention to have the vaccine is higher in women. This shows that even healthcare professionals lack knowledge and sensitivity about the health problems of HPV in men and HPV vaccination is appropriate and necessary for men as well.

The health belief model is used in many assessment areas to help determine health behaviours. When the health belief model for HPV infection and vaccination was evaluated in the present study, it was seen that the perceived severity, benefits and susceptibility were high, and the perceived barriers were moderate. However, in a survey conducted with students of the faculty of health sciences, HBMS-HPVV severity, benefits and susceptibility scores were lower than in the present study while perceived barriers scores were higher (19). This means vocational education can positively affect attitudes towards HPV and its vaccine over time.

There are some limitations and strengths of the present study. First, the results cannot be generalized to the population due to the lack of probabilistic sample selection. The results should be interpreted with caution since the participation rate of health workers with more positive attitudes and behaviours about vaccination may be higher. Another limitation is that vaccination status is based on the declaration. In the present study, participants' knowledge levels, beliefs and attitudes towards HPV vaccination were evaluated with valid and reliable scales. In the literature review, few studies assess the acceptability of the HPV vaccine in society with the health belief model in Turkey. No study evaluates this issue, especially among healthcare professionals. In addition, the evaluation of different occupational groups and both sexes in the present study enriches the current findings.

CONCLUSION

In the present study group consisting of healthcare professionals, the knowledge about HPV and vaccination is sufficient. According to the health belief model, it was shown that the perceived benefit, seriousness and susceptibility towards HPV and its vaccine was high, and the perceived barriers towards the HPV vaccine were at a moderate level. Despite this, the study group's vaccine coverage (7.7%) is relatively low. Vaccination is associated with HPV knowledge level, benefit, susceptibility, and perceived barriers. Additionally, it was shown that the HPV vaccination rate is higher in those whose first-degree relatives or close friends had HPV vaccination. In this sense, the concepts of social interaction and role models are crucial. Even in this study group that the society accepts as a reference for health and consists of healthcare workers with regular income, one out of every three participants indicated vaccination costs as the reason for not having the vaccination. This should be evaluated, and if necessary, efforts should be increased to include the vaccination cost

in the scope of GHI. In the present study, one out of every two participants stated that they did not have the vaccine due to insufficient information, and the need for education about the HPV vaccine is quite high. For this reason, the subjects of negative results of HPV in both sexes, the effectiveness of vaccines, side effects, etc., should be added to vocational education and in-service training.

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Author Contributions

NY: Planning the study; processing data; formal analysis; research; methodology; visualization; writing the article, editing.

BT: Planning the study; processing data; research; methodology; writing the article, editing.

REFERENCES

1. De Villiers E-M, Fauquet C, Broker TR, Bernard H-U, Zur Hausen H. Classification of papillomaviruses. *Virology*. 2004;324(1):17-27.
2. Bruni L, Barrionuevo-Rosas L, Albero G, Serrano B, Mena M. Gomez D., et al. ICO Information Centre on HPV and Cancer (HPV Information Centre) Human Papillomavirus and Related Diseases in the World Summary Report. 2016;15.
3. HSGM TCSB. Türkiye Kanser İstatistikleri 2017. 2021.
4. Garnett GP, Kim JJ, French K, Goldie SJ. Modelling the impact of HPV vaccines on cervical cancer and screening programmes. *Vaccine*. 2006;24:S178-S86.
5. Waller J, Ostini R, Marlow LA, McCaffery K, Zimet G. Validation of a measure of knowledge about human papillomavirus (HPV) using item response theory and classical test theory. *Preventive medicine*. 2013;56(1):35-40.
6. Demir F. Human Papilloma Virüsü (Hpv) Bilgi Ölçeği'nin Türkçe Geçerlik Ve Güvenirliliği, Sağlık Bilimleri Üniversitesi, Gülhane Sağlık Bilimleri Enstitüsü, Halk Sağlığı Hemşireliği Anabilim Dalı. Yayınlanmamış Yüksek Lisans Tezi. 2019.
7. Kim HW. Knowledge about human papillomavirus (HPV), and health beliefs and intention to recommend HPV vaccination for girls and boys among Korean health teachers. *Vaccine*. 2012;30(36):5327-34.
8. Guvenc G, Seven M, Akyuz A. Health belief model scale for human papilloma virus and its vaccination: adaptation and psychometric testing. *Journal of pediatric and adolescent gynecology*. 2016;29(3):252-8.

9. Özdemir S, Akkaya R, Kardeşahin KE. Analysis of community-based studies related with knowledge, awareness, attitude, and behaviors towards HPV and HPV vaccine published in Turkey: A systematic review. *Journal of the Turkish German Gynecological Association*. 2020;21(2):111.
10. Karasu AFG, Adanir I, Aydin S, İlhan GK, Ofli T. Nurses' knowledge and opinions on HPV vaccination: a cross-sectional study from Istanbul. *Journal of Cancer Education*. 2019;34(1):98-104.
11. Agadayi E, Karademir D, Karahan S. Knowledge, Attitudes and Behaviors of Women who have or have not had human papillomavirus vaccine in Turkey about the Virus and the vaccine. *Journal of Community Health*. 2022:1-8.
12. Tolunay O, Celik U, Karaman SS, Celik T, Resitoglu S, Donmezer C, et al. Awareness and attitude relating to the human papilloma virus and its vaccines among pediatrics, obstetrics and gynecology specialists in Turkey. *Asian Pacific Journal of Cancer Prevention*. 2015;15(24):10723-8.
13. Yanikkerem E, Koker G. Knowledge, attitudes, practices and barriers towards HPV vaccination among nurses in Turkey: a longitudinal study. *Asian Pacific Journal of Cancer Prevention*. 2014;15(18):7693-702.
14. Ojeaga A, Alema-Mensah E, Rivers D, Azonobi I, Rivers B. Racial disparities in HPV-related knowledge, attitudes, and beliefs among African American and white women in the USA. *Journal of Cancer Education*. 2019;34(1):66-72.
15. Fernandes R, Potter BK, Little J. Attitudes of undergraduate university women towards HPV vaccination: a cross-sectional study in Ottawa, Canada. *BMC women's health*. 2018;18(1):1-9.
16. Walsh CD, Gera A, Shah M, Sharma A, Powell JE, Wilson S. Public knowledge and attitudes towards Human Papilloma Virus (HPV) vaccination. *BMC public Health*. 2008;8(1):1-9.
17. HPV Vaccination Recommendations. Centers for Disease Control and Prevention. 2021.
18. Özbakir NA, Özşahin A, Edirne T. Family doctors and nurses' knowledge levels and awareness of cervical cancer and Hpv Vaccine in an urban area in Turkey. *Pamukkale Tıp Dergisi*. 2019;12(3):457-66.
19. Altıntaş RY, Erciyas ŞK, Ertem G. Sağlık Bilimleri Fakültesi Öğrencilerinin Serviks Kanseri ile Human Papilloma Virüs Enfeksiyonu Aşılmasına İlişkin Sağlık İnanç Düzeylerinin Belirlenmesi. *Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi*. 2022;15(1):40-9.