



ORIGINAL ARTICLE

Knowledge, Attitudes, and Beliefs of Parents Toward the Human Papilloma Virus Vaccine

Ebeveynlerin Human Papilloma Virüs Aşısına Yönelik Bilgi, Tutum ve İnançları

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Abstract

Objective: To evaluate the attitudes, beliefs, and knowledge of parents regarding the human papilloma virus (HPV) vaccine.

Method: We conducted a cross-sectional study using a digitally prepared survey form delivered via social media platforms to 420 participants with children aged 9-18 years. "Data collection forms included the descriptive information form and health belief model scale on HPV infection and vaccination." Statistical differences between the groups were analyzed using t-tests and ANOVA. The source of the discrepancy among groups (post-hoc) was examined using the Bonferroni test.

Results: Among the parents, 53.3% lacked adequate knowledge regarding the vaccine, 92.4% had not vaccinated their children against HPV, and another 39.5% were undecided regarding vaccination. The primary reason for not vaccinating, as reported by 34.0% of respondents, was inadequate knowledge regarding the vaccine. Differences were observed in the perceived benefit, barrier, sensitivity, and severity of HPV vaccines based on hearing about the vaccine, personal vaccination status, consideration of vaccinating one's child, source of vaccine information, fear of vaccine side effects, and lack of information ($p<0.05$).

Conclusion: The study found that most participating parents lacked sufficient knowledge on HPV vaccines. Beliefs about HPV vaccination were affected by fear of side effects, scarcity of information, and seeking information from non-healthcare sources. In future research, it is recommended that healthcare providers, such as nurses, who offer health services to their community and have education and counseling duties related to health, prepare and enact training initiatives on HPV vaccination for both parents and adolescents.

Keywords: Human papilloma virus, parents, knowledge, attitude, belief

Öz

Amaç: Ebeveynlerin human papilloma virüs (HPV) aşısına yönelik bilgi, tutum ve inançları incelemektir.

Yöntem: Bu kesitsel araştırma 9-18 yaş arasında çocuğu olan 420 ebeveyn ile gerçekleştirildi. Veriler dijital ortamda hazırlanan veri toplama formunun online anket bağlantısı ebeveynlere sosyal medya platformları aracılığı ile ulaştırılarak verileri toplandı. "Tanıtıcı bilgi formu" ve "HPV enfeksiyonu ve aşılmasına ilişkin sağlık inanç modeli ölçeği" veri toplama formlarıydı. Gruplar arasındaki istatistiksel farklar t-testleri ve ANOVA kullanılarak analiz edildi. Gruplar arasındaki farklılığın kaynağı (post-hoc) Bonferroni testi kullanılarak incelendi.

Bulgular: Ebeveynlerin %53,3'ü HPV aşısı hakkında yeterli bilgiye sahip değildi. %92,4'ü çocuğuna HPV aşısı yaptırmamıştı ve 39,5'i yaptırmada kararsızdı. Aşı hakkındaki bilgi yetersizliği aşı yaptırmama nedenlerinin en başındaydı (%34,0). Daha önce HPV aşısını duyma, kendisine aşı yaptıрма, çocuğuna aşı yaptırmayı düşünme, aşı hakkındaki bilgi kaynağı (internet), HPV aşısının yan etki oluşturabileceği korkusu, bilgi yetersizliği HPV aşılara yönelik ebeveynlerin algıladıkları yarar, engel, duyarlılık ve ciddiyet farklılık gösteriyordu ($p<0,05$).

Sonuç: Bu çalışma, katılımcı ebeveynlerin çoğunun HPV aşıları hakkında yeterli bilgiye sahip olmadığını ortaya koydu. Yan etki korkusu, bilgi yetersizliği ve sağlık profesyoneli dışındaki bir kaynaktan bilgi edinmek ebeveynlerin HPV aşısına yönelik inançlarını etkiliyordu. Gelecek araştırmalarda topluma sağlık hizmeti sunan, sağlık konusunda eğitim ve danışmanlık görevleri bulunan hemşirelerin ebeveynlere ve adölesanlara yönelik HPV aşısının uygulanması konusunda eğitimler planlaması ve uygulaması önerilmektedir.

Anahtar Kelimeler: Human papilloma virüs, ebeveyn, bilgi, tutum, inanç

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Introduction

Human papilloma virus (HPV) is responsible for cervical, anal, and penile cancers, and genital warts, in both men and women. It is the most prevalent sexually transmitted infection worldwide, with an estimated lifelong probability of infection exceeding 80% (1). Globally, cervical cancer rates are the highest among cancers caused by HPV. According to the World Health Organization (WHO), in 2020 alone, approximately 604,000 women received a cervical cancer diagnosis, with 342,000 women losing their lives due to the disease (2). More than 99% of cervical cancer patients have at least one oncogenic HPV genotype. HPV 16 and 18 are responsible for approximately 70% of cervical cancers worldwide, whereas HPV 6 and 11 cause approximately 90% of genital warts (3,4).

HPV-related diseases can be prevented through primary prevention measures such as prophylactic vaccination. The HPV vaccine is administered in vaccination programs worldwide, primarily to young girls, but it is also approved for both sexes and covers boys in some countries and regions (1,5,6). The WHO has endorsed the HPV vaccine as the initial strategy in the prevention of cervical cancer and recommended its administration before the first sexual encounter (7).

Parents play a crucial role in deciding whether to vaccinate their children against HPV. Previous research indicates that vaccine acceptance is influenced by knowledge, personal beliefs, and health behaviors. Several studies across different settings suggest that parents possess inadequate knowledge about HPV and the HPV vaccine (1,8,9). Positive parental beliefs and attitudes are significant predictors of HPV vaccination. Scientific literature indicates that parents with a strong perception of the benefits of HPV vaccine, who believe in its efficacy and protective value against life-threatening illnesses, are more inclined to immunize their offspring (10,11).

Cervical cancer accounts for 3.7% of all cancers in Turkey and is the third most common type of genital cancer in women (12). Despite this, the national routine vaccination schedule in Turkey does not yet include the HPV vaccine (13). Studies have shown that some parents may be hesitant to vaccinate their school-age children against HPV for various reasons (14). Nurses are professionals who frequently interact with children and their parents. They can provide parents with counseling on HPV vaccination and address their concerns and hesitations. By taking an active role in improving adolescent health, nurses can assess parents' attitudes and

beliefs toward HPV vaccination, develop comprehensive educational programs to address knowledge gaps, and reduce vaccine hesitancy (15). Understanding parental attitudes toward HPV vaccination and identifying barriers can inform the development of effective interventions to increase vaccination rates (16). However, only a limited number of published studies have focused on determining nurses' knowledge, beliefs, and attitudes toward HPV vaccination among parents (17,18).

Material and Method

Study Design and Participants

The study was conducted using a cross-sectional design. The study population comprised parents residing in Turkey. Convenience sampling, a non-probability sampling method, was used because it was not feasible for the researchers to identify the participating parents in the digital environment. An online survey was conducted between March and October 2023, and 420 parents were interviewed. The inclusion criteria were as follows: (a) Being a parent (b) Having a child between the ages of 9 and 18 (c) Agreeing to participate in the study (d) Completing the data collection forms.

Data Collection

Data were collected from March to October 2023 via social media platforms, where parents were given access to an online survey link to a digitally prepared data collection form. Before participation, parents were informed about the data's purpose, scope, measurement tools, and confidentiality. The "introductory information form" and "health belief model scale on human papillomavirus infection and vaccination (HBMS-HPVV)" were implemented to collect data.

Descriptive information form: The form, created in accordance with the literature (19-21), comprised six queries that aimed to establish descriptive traits of the child and parents, demographic details, familiarity with general vaccinations, HPV vaccination, and vaccination status.

HBMS-HPVV: Kim (22) developed this scale to determine health beliefs. Guvenc et al. (23) adapted the Turkish version in 2016. The scale comprises four sub-dimensions: The perception of seriousness (4 items), the perception of obstacles (5 items), the perception of benefits (3 items), and the perception of sensitivity (2 items). The items on the scale are of the four-point Likert type and require responses ranging from "not at all" (1 point) to "very much" (4 points), with "a little" (2 points) and "quite" (3 points) in between. The responses by the individual are scored on the item's score, and the overall scores of each subsection are computed. The final score is determined by dividing the total score by the number of items present in the subsection, after which the scores for severity, obstacle, sensitivity, and benefit are calculated. The average score for each subsection falls within the range of 1-4. A high perception of benefit score indicates that the respondent believes that HPV vaccination provides benefits, whereas a high perception of seriousness

Main Points

- Most parents who participated had insufficient knowledge of the human papilloma virus (HPV) vaccines.
- Parental beliefs toward HPV vaccination were influenced by fear of side effects, lack of information, and obtaining information from a non-medical professional source.
- Health professionals play a critical role in educating families, which can enhance vaccine awareness and acceptance rates among parents.

score indicates that the respondent views HPV infection as a serious issue. Similarly, a high barrier score means that the respondent perceives obstacles hindering vaccination, and a high sensitivity score indicates significant personal sensitivity toward this matter. The sub-dimensions of the scale demonstrated high reliability coefficients with Cronbach's alpha values of 0.78 for the perception of seriousness, 0.71 for the perception of barrier, 0.78 for the perception of benefit, and 0.72 for the perception of sensitivity. The total Cronbach's alpha reliability coefficient cannot be calculated because the scale's total score was not assessed (23). The study identified the perception of seriousness as 0.78, perception of obstacle as 0.76, perception of benefit as 0.77, and perception of sensitivity as 0.84.

Statistical Analysis

Statistical analyses were conducted using SPSS 22.0 software. Descriptive data were analyzed using the measures of frequency, percentage, mean, and standard deviation. Normal distribution of the data was confirmed by examining the skewness and kurtosis values. Statistical differences between the groups were analyzed using t-tests and ANOVA. The source of the discrepancy among groups (post-hoc) was examined using the Bonferroni test. The level of significance was assessed at $p < 0.05$.

Ethics

Ethical approval was obtained from the Social and Humanities Ethics Committee of the Bartın University (protocol number: 2023-SBB-0003, date: January 18, 2023). Before the online survey's commencement, parents were informed about the study's purpose and extent as well as data confidentiality and were asked to indicate their consent by checking the appropriate box if they wished to proceed with the survey. All study procedures were performed in accordance with the Declaration of Helsinki.

Results

Of the study participants, 80.5% were mothers, and the average age of parents was 38.75 ± 3.79 years, with a range of 23-63 years. An estimated 51.2% of the parents were university graduates and reported a medium income level. The majority of families surveyed (89.5%) were classified as extended households, and 53.8% had one child (Table 1).

Specifically, the mean score for "perceived benefit" was 3.14 ± 1.18 , "perceived susceptibility" was 3.09 ± 1.33 , "perceived severity" was 3.10 ± 0.64 , and "perceived barrier" was 2.31 ± 0.77 . The parental mean scores for the HBMS-HPVV subscales were low overall. This means that individuals who believe that HPV vaccination is advantageous, consider HPV infection a grave issue, perceive significant obstacles to vaccination, and exhibit low sensitivity to the subject (Table 2).

96.7% of parents vaccinated their children according to the Ministry of Health's vaccination schedule. The most prevalent reason for not adhering to the schedule (3.0%) was distrust of vaccine ingredients. In addition, 76.7% of participants reported prior knowledge of the HPV vaccine. Of these, 53.3% lacked sufficient familiarity with the vaccine and 83.3% had not been vaccinated themselves. Parents received most of their information about the HPV vaccine (19.8%) from

Table 1.
Characteristics of Parents (n=420)

	n	%
Parent		
Mother	338	80.5
Father	82	19.5
Age (parents)	Mean \pm SD=38.75 \pm 3.79	Min-max=23-63
Education status		
Primary-secondary school	28	6.7
High school	74	17.6
University	215	51.2
Postgraduate	103	24.5
Income status		
Good	100	23.8
Middle	300	71.4
Bad	20	4.8
Family type		
Extended family	24	5.7
Nuclear family	376	89.5
Fragmented family	20	4.8
Number of children		
1	226	53.8
2	148	35.2
3	30	7.1
4 and more	16	3.8

SD=Standard deviation

Table 2.
Distribution of Parents' Scores in the Sub-dimensions of the Health Belief Model Scale on Human Papillomavirus Infection and Vaccination (n=420)

	Mean \pm SD	Minimum
HBMS-HPVV		
Perceived benefit	3.14 \pm 1.18	1
Perceived responsiveness	3.09 \pm 1.33	1
Perceived seriousness	3.10 \pm 0.64	1
Perceived barrier		

HBMS-HPVV=Health belief model scale of human papilloma virus infection and vaccination, SD=standard deviation

educational institutions. Of the parents surveyed, 92.4% had not vaccinated their child against HPV, and 39.5% were undecided. The primary reason for not vaccinating was a

lack of information about the vaccine, with 34.0% citing this as the main barrier (Table 3).

Table 3.
Difference in the Mean Scores of HBMS-HPVV Sub-dimensions According to Parents' Knowledge and Behaviors Regarding General Vaccines and HPV Vaccine (n=420)

		Perceived benefit	Perceived responsiveness	Perceived seriousness	Perceived barrier	
	n	%	Mean ± SD	Mean ± SD	Mean ± SD	
Having your child(ren) vaccinated against vaccines included in the Ministry of Health vaccination calendar						
Yes	406	96.7	3.16±1.19	3.10±1.34	3.12±0.64	2.31±0.77
No	14	3.3	2.52±0.71	2.64±0.77	2.71±0.29	2.40±0.77
Significance			t=3.230, p=0.005	t=2.151, p=0.047	t=4.840, p<0.001	t=-0.399, p=0.696
Reasons for not having their child/children vaccinated against the vaccines included in the Ministry of Health vaccination calendar*						
Inadequate information on vaccinations	6	1.4	2.88±0.86	2.83±0.93	3.25±0.59	2.26±1.26
Disbelief in the impact of vaccination on diseases	2	0.5	3.12±0.88			
Allocation of some vaccines for a fee	4	1.0	2.83±0.96	3.25±0.28	3.12±0.14	2.50±0.80
Distrust of the content of vaccines	14	3.3	2.52±0.85	2.14±0.81	2.53±0.84	2.51±0.78
Significance			F=0.443, p=0.724	F=2.848, p=0.061	F=2.424, p=0.075	F=0.940, p=0.438
Hearing about the HPV vaccine						
Yes	322	76.7	3.27±1.26	3.08±0.72	3.16±0.57	2.31±0.77
No	98	23.3	2.74±0.79	3.13±2.43	2.92±0.79	2.33±0.76
Significance			t=4.952, p<0.001	t=-0.208, p=0.835	t=2.724, p=0.007	t=-0.178, p=0.859
Getting herself vaccinated against HPV						
Yes	70	16.7	3.72±2.36	3.20±0.74	3.35±0.59	2.18±0.83
No	350	83.3	3.03±0.71	3.07±1.42	3.05±0.64	2.34±0.75
Significance			t=2.430, p=0.018	t=1.100, p=0.273	t=3.780, p<0.001	t=-1.442, p=0.153
Acquire adequate knowledge about the HPV vaccine						
Yes	196	46.7	3.50±1.48	3.29±0.62	3.34±0.52	2.23±0.82
No	224	53.3	2.83±0.71	2.91±1.70	2.90±0.66	2.38±0.71
Significance			t=5.827, p<0.001	t=3.063, p=0.002	t=7.588, p<0.001	t=-1.995, p=0.047
HPV vaccine information resource*						
People who have received this vaccine (1)	16	3.8	3.00±0.17	2.84±0.27	2.79±0.17	2.41±0.18
Healthcare professionals (2)	80	19.0	3.57±0.24	3.21±0.06	3.21±0.05	2.17±0.07
Newspapers, journals, and scientific articles (3)	33	7.9	3.26±0.08	3.15±0.12	3.18±0.07	2.56±0.15
Institutions attended (4)	83	19.8	3.36±0.07	3.28±0.08	3.42±0.06	2.27±0.09
Television/internet/social media (5)	18	4.3	3.25±0.15	2.77±0.21	3.11±0.13	2.95±0.18
Significance			F=1.568, p=0.295	F=1.847, p=0.180	F=1.133, p=0.401	F=3.658, p=0.003
Post-hoc						2-5 p=0.002 4-5 p=0.011

Table 3.
Continued

			Perceived benefit	Perceived responsiveness	Perceived seriousness	Perceived barrier
	n	%	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
HPV vaccination for your child(ren)						
Yes	32	7.6	3.27±0.61	3.07±0.82	3.09±1.36	2.27±0.88
No	388	92.4	3.13±1.22	3.09±1.36	3.25±0.64	2.32±0.76
Significance			t=1.067, p=0.291	t=-0.099, p=0.922	t=1.293, p=0.197	t=-0.293, p=0.772
Considering HPV vaccination for the child						
Yes (1)	170	40.4	3.64±0.12	3.56±0.13	3.38±0.03	2.25±0.06
No (2)	72	17.1	2.58±0.08	2.33±0.10	2.63±0.08	2.56±0.08
Not sure (3)	166	39.5	3.47±0.05	3.41±0.05	3.21±0.04	2.27±0.05
Significance			F=20.856, p<0.001	F=18.291, p<0.001	F=10.647, p<0.001	F=1.911, p=0.021
Post-hoc			1-2, p<0.001	1-2, p<0.001	1-2, p<0.001	1-2, p=0.024
Reason for not vaccinating						
Lack of information about the vaccine (1)	143	34.0	2.76±0.05	3.01±0.16	2.89±0.05	2.34±0.06
Fear of side effects (2)	21	5.0	3.33±0.12	2.85±0.13	3.10±0.11	1.84±0.05
Thought it was not necessary (3)	12	2.9	2.88±0.18	2.50±0.21	2.70±0.14	2.53±0.21
Fear of infertility (4)	2	0.5	2.33±0.19	3.00±0.17	2.75±0.15	2.40±0.29
Possibility of interfering with my child's hormones (5)	2	0.5	2.00±0.36	2.00±0.26	4.00±0.19	1.00±0.39
Risk of allergy (6)	2	0.5	2.66±0.10	2.50±0.14	2.50±0.21	2.20±0.22
S/he is young, s/he should decide with her/his own knowledge in the future (7)	6	1.4	2.88±0.30	3.33±0.42	3.16±0.38	2.40±0.36
Not wanting to be given a virus, even preventively, if there are no symptoms (8)	6	1.4	2.83±0.38	2.16±0.45	2.25±0.45	3.53±0.15
Mistrust of vaccines (9)	12	2.9	2.22±2.22	2.00±0.33	2.91±0.20	2.80±0.10
Thinks the child is a minor (10)	14	3.3	3.03±0.08	2.78±0.17	3.25±0.12	2.28±0.18
Significance			F=3.589, p<0.001	F=0.743, p=0.670	F=2.228, p<0.022	F=5.193, p<0.001
Post-hoc			2-8, p=0.031 2-9, p=0.030		5-8, p=0.042	1-8, p<0.001 2-8, p<0.001 2-9, p<0.001

*More than one option was marked.

HPV=human papilloma virus, HBMS-HPVV=health belief model scale on human papilloma virus infection and vaccination, SD=standard deviation

The perceived benefits (3.16±1.19, 2.52±0.71; t=3.230, p=0.005), perceived susceptibility (3.10±1.34, 2.64±0.77; t=2.151, p=0.047), and perceived seriousness (3.12±0.64, 2.71±0.29; t=4.840, p<0.001) were observed to be higher among those who had heard about the HPV vaccine, compared to those who had not. Additionally, the mean scores of perceived benefits (3.27±1.26, 2.74±0.79; t=4.952, p<0.001) and perceived seriousness (3.16±0.57, 2.92±0.79; t=2.724, p=0.007) from the HBMS-HPVV sub-dimensions were higher among parents who had heard about the HPV vaccine than among those who had not. The mean

scores for perceived benefits (3.72±2.36, 3.03±0.71; t=2.430, p=0.018) and perceived seriousness (3.35±0.59, 3.05±0.64; t=3.780, p<0.001) of parents who received HPV vaccination were higher than those who did not. Parents who were sufficiently informed about the HPV vaccine had higher scores for perceived benefits (3.50±1.48, 2.83±0.71; t=5.827, p<0.001) and perceived sensitivity (3.29±0.61, 2.96±0.69; t=4.310, p<0.001) in the HBMS-HPVV sub-dimensions. The scores for perceived seriousness (3.34±0.52, 2.90±0.66; t=7.588, p<0.001), perceived barrier (2.23±0.82, 2.38±0.71; t=-1.995, p=0.047), and the numerical data (62, 2.91±1.70;

$t=3.063$, $p=0.002$) indicated higher values compared to those without. Participants who received information about the HPV vaccine from TV/internet/social media (mean score of 2.95 ± 0.18) reported higher perceived barriers from the HBMS-HPVV sub-dimensions than those who obtained information from health professionals (mean score of 2.17 ± 0.07) and educational institutions (mean score of 2.27 ± 0.09) ($F=3.658$, $p=0.003$). Parents considering HPV vaccination for their children scored higher in the sub-dimensions of perceived benefit (3.64 ± 0.12 , 2.58 ± 0.08 ; $p<0.001$), perceived susceptibility (3.56 ± 0.13 , 2.33 ± 0.10 ; $p<0.001$) and perceived seriousness (3.38 ± 0.03 , 2.63 ± 0.08 ; $p<0.001$) of the HBMS-HPVV. Additionally, their mean score for perceived barrier (2.25 ± 0.06) was lower than those who did not consider vaccination (2.56 ± 0.08 ; $p=0.024$).

Parents who did not vaccinate their children against HPV because of concerns about side effects (mean score 3.33 ± 0.12) had higher perceived benefit scores in the HBMS-HPVV sub-dimensions compared with those who refused the vaccine as a preventive measure for their children in the absence of symptoms (mean score 2.00 ± 0.36) or were skeptical about the vaccine (mean score 2.22 ± 0.22) ($F=3.589$, $p<0.001$). Parents concerned about the impact of vaccination on their child's hormones (mean score of 4.00 ± 0.19) reported higher perceived benefits on the HBMS-HPVV subscale compared with parents with vaccination insecurity (mean score of 2.25 ± 0.45) ($F=2.228$, $p<0.022$). The mean scores for perceived benefits of the HBMS-HPVV sub-dimensions were higher among parents who would not administer the vaccine, even if it was preventive and no symptoms were present (3.53 ± 0.15). In contrast, parents with insufficient knowledge about vaccination (2.34 ± 0.06) and those who did not vaccinate their children because of fear of side effects (1.84 ± 0.05) had lower scores. This difference was statistically significant ($F=5.193$, $p<0.001$) (Table 3).

Discussion

This study investigated parents' knowledge, attitudes, and beliefs regarding the HPV vaccine. Of the parents surveyed, 76.7% had prior awareness of the vaccine. However, 53.3% lacked adequate information, and a striking 92.4% had not inoculated their children. The perceived benefits, barriers, sensitivity, and severity of HPV vaccines among parents varied depending on whether they had prior knowledge of the HPV vaccine, received the vaccine themselves, considered vaccinating their child, received information about the vaccine from the internet, fear of possible side effects from the vaccine, and lack of information available. Although the efficacy of the HPV vaccine is well documented, the studies analyzed reveal limited public awareness and knowledge regarding the vaccine (3,24). The number of studies focusing on awareness of this matter should be increased.

In the study, 92.4% of parents did not vaccinate their children against HPV, while 39.5% were undecided. Insufficient

information about vaccination was the primary cause of both low vaccination rates and indecision. Thus, it is crucial for midwives and nurses to provide information and training on the topic. It is imperative to inform healthcare professionals, who are significant information sources, about this matter to promote HPV vaccination in society (25).

The perceived benefits, barriers, sensitivity, and severity of HPV vaccines varied among parents with insufficient knowledge about the vaccine compared with those with adequate knowledge, according to the study. In Thailand, a correlation was found between parents' knowledge and beliefs about the HPV vaccine and their acceptance of it (26). The acceptance rate of HPV vaccination for girls among Indonesian parents is notably higher, standing at 96%, compared with that of the United States, which is only 75% (27). In Brazil, 92% of parents approved HPV vaccination for girls and 86% approved for boys aged 18 and under (28). Because the HPV vaccine has not yet been incorporated into the national vaccination program in our country, parents' comprehension and views regarding the vaccine significantly affect its feasibility. Consequently, this situation indicates that families need additional information about the HPV vaccine, and parents must be educated on this issue to enhance vaccination rates.

In our study, the main reason why parents did not have their children vaccinated against the HPV vaccine was inadequate knowledge about the vaccine. Other factors included perceived risks of the vaccine, such as potential severe reactions and side effects, concerns that girls aged 9-13 were too young for vaccination, and fears that the vaccine could promote earlier sexual activity among girls (28). According to a study conducted in our country, 70% of parents oppose HPV vaccination because of a lack of detailed information about the vaccine (3). Misunderstandings about the HPV vaccine are often due to inadequate knowledge of the vaccine (24).

Parents who feared that the HPV vaccine could cause side effects perceived a higher level of barrier against HPV vaccination. Bonanni et al. (29) reported no deaths due to the HPV vaccine in their study and found it to be generally safe and well-tolerated. The most frequently reported side effects were local complications related to the injection site. Despite the scientific evidence supporting HPV vaccination, there are various barriers, including psychological conditions, religious and cultural beliefs, and concerns regarding severe side effects such as orthostatic tachycardia syndrome. In societies where media and websites are prominent information sources, the proliferation of unverified misinformation puts many women at risk of developing HPV-related cancer. VanWormer et al. (30) found that concerns about vaccine harms can negatively impact individuals' vaccination status.

This study found that parents have insufficient knowledge about HPV vaccination. Lack of information poses a significant obstacle for parents when making decisions

about their children's healthcare. This lack of knowledge has also been reported in previous studies (31,32). Despite the availability of the HPV vaccine in Turkey since 2007, many parents are hesitant to vaccinate their daughters because of a lack of awareness or fear of side effects (32). To address this issue, it is important to increase awareness about HPV vaccination among parents. Nurses can play a crucial role in organizing training programs for parents (15). Through this training, parents can receive accurate information about the vaccine and correct any misinformation about its associated risks (33,34).

Study Limitations

The study had some limitations. First, although providing data collection online provides a wider and faster reach to participants, it may also require internet access and a certain level of education. This may limit the findings obtained from representing the society. Secondly, the education level of the majority of the parents in the study was university or postgraduate. This may limit the generalizability of the results. Thirdly, the fact that the study was conducted in Turkey may have some opinions about HPV screening in Muslim countries, especially for unmarried sexually active women.

Conclusion

The study revealed that most parents who participated had insufficient knowledge regarding HPV vaccines. Parental beliefs toward HPV vaccination were influenced by fear of side effects, lack of information, and obtaining information from a non-medical professional source. Successful implementation of screening and vaccination programs aimed at protecting and improving health relies heavily on the role of nurses. Nurses play a critical role in educating families, which can enhance vaccine awareness and acceptance rates among parents. In future research, nurses who deliver health services and have obligations for health education and counseling in the community should organize and execute training sessions aimed at HPV vaccination for parents and adolescents. These sessions will significantly promote awareness of HPV vaccination among the public and potentially reduce the incidence of cervical cancer.

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