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Investigation of Women's Health Literacy and Health Beliefs About Human Papilloma Virus and Vaccine: A Cross-Sectional Descriptive Study
Kadınların Sağlık Okuryazarlığı ve Human Papilloma Virüsü ve Aşısına Yönelik Sağlık İnançlarının İncelenmesi: Kesitsel ve Tanımlayıcı Tipte Bir Araştırma

Janıl Alanur HAKİM [1]   iD   **Aslı KARAKUŞ SELÇUK** [2]   iD

[1] Nurse, Medigüneş Hospital, Manisa, Turkey.

[2] Assistant Professor, Manisa Celal Bayar University, Faculty of Health Science, Department of Obstetrics and Gynecologic Nursing, Manisa, Turkey.

Sorumlu yazar / Corresponding author

Aslı KARAKUŞ SELÇUK

akarakus_ksk@hotmail.com

ABSTRACT

Aim: This study aimed at investigating the women's health literacy levels and health beliefs regarding human papillomavirus and human papillomavirus vaccine.

Material and Method: The cross-sectional descriptive study was conducted in a gynecology outpatient clinic between November 2023 and March 2024 in Türkiye. The sample of the study consisted of 368 women. The descriptive characteristics questionnaire of the participants, Health Belief Model Scale for Human Papilloma Virus and its Vaccination and Health Literacy Scale were used to obtain research data.

Results: Results indicated that while the participants' perceived barriers sub-dimension score was below the average, their scores for the perceived severity, perceived benefits and perceived susceptibility sub-dimensions were above the average. Women who were young, those who were single, those who had senior high school or higher education, who were employed, those who did not have children, who had gynecological examinations regularly and those who had received training on human papillomavirus had higher health literacy and perception levels. A positive relationship was determined between health literacy, and perceived severity, perceived benefits and perceived susceptibility.

Conclusion: Health professionals can contribute to increasing women's general health literacy knowledge levels by providing guidance to help them understand and implement health information better.

Keywords: Human papillomavirus, Vaccine, Belief, Health literacy

ÖZET

Amaç: Bu çalışmada kadınların sağlık okuryazarlığı ile human papilloma virüs ve aşısına yönelik sağlık inançlarının araştırılması amaçlanmıştır.

Gereç ve Yöntem: Kesitsel tanımlayıcı çalışma, Kasım 2023 ile Mart 2024 tarihleri arasında Türkiye'de bir jinekoloji polikliniğinde yürütülmüştür. Çalışmanın örneklemini 368 kadın oluşturmuştur. Araştırma verilerini elde etmek için katılımcıların tanımlayıcı özellikler soru formu, Human Papilloma Virüsü ve Aşısına Yönelik Sağlık İnanç Modeli Ölçeği ve Sağlık Okuryazarlığı Ölçeği kullanılmıştır.

Bulgular: Katılımcıların algılanan engeller alt boyut puanının ortalamanın altında olduğunu, algılanan ciddiyet, algılanan yarar ve algılanan duyarlılık alt boyut puanlarının ise ortalamanın üzerinde olduğu saptanmıştır. Genç, bekar, lise veya üzeri eğitime sahip, çalışan, çocuğu olmayan, düzenli olarak jinekolojik muayene yaptıran ve human papilloma virüsü konusunda eğitim almış kadınların sağlık okuryazarlığı ve sağlık inançları düzeyleri daha yüksektir. Sağlık okuryazarlığı ile algılanan ciddiyet, algılanan yarar ve algılanan duyarlılık arasında pozitif bir ilişki tespit edilmiştir.

Sonuç: Sağlık profesyonelleri, sağlık bilgilerini daha iyi anlamalarına ve uygulamalarına yardımcı olmak için rehberlik sağlayarak kadınların genel sağlık okuryazarlığı bilgi düzeylerinin artırılmasına katkıda bulunabilirler.

Anahtar Kelimeler: Human papillomavirus, Aşı, İnanç, Sağlık okuryazarlığı

INTRODUCTION

Human papillomavirus (HPV) is a widespread sexually transmitted infection that can result in cervical cancer (CC), anogenital and oropharyngeal malignancies, and anogenital warts. Of CC, 95% are caused by untreated HPV infection (World Health Organization [WHO], 2024). Current estimates indicate that 604,127 women are diagnosed with CC each year, and 341,831 women died from CC in 2020 (Bruni et al., 2023). The incidence of CC in Türkiye is 4.2 per hundred thousand (Türkiye Cancer Statistics, 2018).

As indicated in studies conducted in Türkiye and other countries of the world, due to women's lack of adequate knowledge and awareness about HPV and HPV vaccines, vaccination rates are low (Kitur, Horowitz, Beck, & Wang, 2021; Yarıcı & Mammadov, 2023). Thus, in order to extend HPV vaccination to prevent CC, awareness of HPV infection and beliefs about vaccination against HPV infection should be determined. In several studies conducted on the issue, while, perceived barrier levels were low in women with a higher level of education (Arı, 2021; Gürdal, 2021), who heard of the pap smear test (Gürdal, 2021), who were knowledgeable about HPV (Yıldız, Yolcu, Bıdık, Gökçay, & Şengan, 2023) who heard of the HPV test and vaccine (Gürdal, 2021) and who were vaccinated against HPV, their perceived benefits and perceived susceptibility levels were high (Gürdal, 2021).

In the literature, it has been determined that people who have heard of HPV and the HPV vaccine and who were very knowledgeable about these issues have higher health literacy levels (HLL) (Albright & Allen, 2018; Yilmazel, 2019; Akbaş, 2022; Kitur et al., 2022; Kılınç İşleyen, Korkmaz Aslan, & Kartal, 2024). HL is defined as "the ability of individuals to access, understand and use information in a way that will improve and maintain their own health and their families' health" (WHO, 2024). HL affects women's health in several ways. As women's understanding and use of necessary information about their health increases, so do their behaviors to prevent diseases and to ensure early diagnosis of diseases (Dağlar & Oskay, 2022). The number of studies in the literature in which women's health beliefs and HL regarding HPV and HPV vaccine are investigated is not many (Muturi, 2020; Topkara & Dağli, 2023; Kılınç İşleyen et al., 2024). Since there is need for a greater number of studies to be conducted in different countries to reveal all aspects of this relationship, this study is aimed at investigating the women's HLL and health beliefs regarding HPV and the HPV vaccine.

MATERIAL AND METHOD

Research Type

This study is a cross-sectional descriptive study.

Study Population and Sample

The study population consisted of 5180 women over the age of 18 who applied to a university hospital gynecology clinic in 2022. The sample size of the study was calculated as 358 women. The sampling method was used for known population in the EPİ info 2000 program (confidence interval: 95%, unknown prevalence: 50%, deviation: 5%). Thus, the sample of the study consisted of 368 women who agreed to participate.

The inclusion criteria for the women were being ≥18 years old, having no speech impairment, having no comprehension problems, speaking Turkish, and volunteering to participate in the study. The exclusion criteria were having a diagnosed psychiatric illness and not volunteering to participate in the study.

Data Collection

The present study was conducted with women who presented to a university hospital gynecology outpatient clinic between November 2023 and March 2024. Data were collected from women who presented to a university hospital gynecology clinic, who agreed to participate and met the inclusion criteria, using the face-to-face interview technique.

Data Collection Tools

Descriptive Characteristics of Women Questionnaire: The first section consists of 14 items questioning the participants' age, income, education, employment and smoking status, alcohol use, whether they have heard of HPV and vaccine etc. The descriptive characteristics of the participants are prepared by the researchers (Bynum et al., 2013; Albright & Allen, 2018; Muturi, 2020; Kitur et al., 2022).

Health Belief Model Scale for Human Papilloma Virus and its Vaccination Scale (HBMS-HPVV): The HBMS-HPVV developed by Kim (2012) is included (Kim, 2012). The

Turkish validity and reliability study of the HBMS-HPVV was conducted by Güvenç et al. (2016). The HBMS-HPVV consists of 14 items and the following four sub-dimensions: perceived severity (items 6–9), perceived barriers (items 10–13 and 15), perceived benefits (items 1–3) and perceived susceptibility (items 4, 5). Responses given to the items are rated ranging from one to four (one: not at all, two: a little, three: quite a bit, and four: a great deal). The Cronbach's Alpha values of the sub-dimensions were as follows: perceived severity: 0.78, perceived barriers: 0.71, perceived benefits: 0.78 and perceived susceptibility: 0.72 in Güvenc et al.'s study (Guvenc, Seven, & Akyuz, 2016). In this study, Cronbach's Alpha values were determined as perceived severity: 0.77, perceived barriers: 0.54, perceived benefits: 0.88 and perceived susceptibility: 0.80.

Health Literacy Survey (HLS): The HLS developed by Toç, Bruzar and Sorensen is the short form of the 47-item HL Survey in Europe scale, developed by Sorensen (Sorensen et al., 2013). The validity and reliability study of the Turkish version of the HLS was conducted by Aras and Temel Bayık. The HLS consists of 25 items and the following four sub-dimensions: Access to Information, Understanding Information, Evaluation/Appraisal and Application/usage. Reponses given to the items in the HLS are rated on ranging from one to five (one: I cannot do it/I have no ability/it is impossible two: I have a lot of difficulty, three: I have some difficulty, four: I have little difficulty and five: I have no difficulty). While low scores indicate that the health literacy level of the individual is insufficient and weak, high scores indicate that the health literacy level of the individual is sufficient and very good. As the score increases, so does the respondent's health literacy level. The Cronbach's Alpha value which was 0.92 for the HLS total score ranged between 0.62 and 0.79 for its sub-dimensions (Aras & Temel Bayık, 2017). In this study, Cronbach's Alpha values were determined as 0.92 for the HLS total score. The Cronbach's Alpha values of the sub-dimensions were as follows: Access to Information: 0.86, Understanding Information: 0.79, Evaluation/Appraisal: 0.84 and Application/usage: 0.78 in this study.

Ethical Considerations

Ethical approval was obtained from a university ethics committee (Date: 12.04.2023, Approval Number: 20.478.486/1801). Written permission was obtained from the institution where the research was conducted on May 12, 2023. Written informed consent was obtained from the women who met the inclusion criteria for the study. Permissions to use the scales were received from Güvenç and Temel Bayık via email.

Data Analysis

The SPSS 20.0 program was used for data analysis. The results of the tests demonstrated that the data were distributed homogeneously with the skewness and kurtosis tests. One-Way ANOVA and t test were used to determine the relationship between the independent variables and the mean scores obtained from the overall scales and their sub-dimensions. Bonferroni test was used to determine the variables that created a difference. Pearson correlation analysis was used to determine the relationship between the scores obtained from the two scales used in the study. P values less than 0.05 were accepted as statistically significant.

RESULTS

The mean age of the women was 35.22 ± 12.67 (min: 18, max: 65) years. Of them, 39.9% were high school graduates, 41.6% were employed, 60.1% were married, 59.2% had a family income equal to expenses, 30.4% were smokers, 18.5% consumed alcohol, 57.6% had children, 21.2% had gynecological examinations regularly every year, 24.5% had received education about HPV, 81% had heard of HPV testing, 99.7% had heard of the HPV vaccine. 16.8% had received education about the HPV vaccine, and 4.3% were vaccinated against HPV (Data not shown).

The HBMS-HPVV are as follows: perceived severity: 13.02 ± 2.68 (min: 5, max: 16), perceived barriers: 11.33 ± 2.80 (min: 5, max: 20), perceived benefits: 8.03 ± 2.47 (min: 3, max: 12) and perceived susceptibility: 5.25 ± 1.80 (min: 2, max: 8) (Data not shown). Of the participants, those who were in the age group of 18-24 and those who were graduates of senior high school or higher education obtained significantly higher mean scores from the perceived severity, susceptibility and benefits sub-dimensions than did those who were in the age group of 40-65 years and those who were graduates of primary/junior high school. The participants who had children, who did not drink alcohol and who were married had low levels of perceived severity,

Table 1. The Relationship between the Participants' Sociodemographic Characteristics and the Mean Scores They Obtained from the HBMS-HPVV and its Sub-dimensions

Characteristics	Perceived Severity		Perceived Benefits		Perceived Susceptibility		Perceived Barriers	
	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test
Age								
18-24 years (a)	13.51 ± 2.19	F=3.741	9.31 ± 1.85	F=29.850	5.91 ± 0.50	F=17.840	11.11 ± 2.66	F=0.738
25-39 years (b)	13.11 ± 2.69	**p=0.025***	8.06 ± 2.44	**p=0.000***	5.41 ± 1.90	**p=0.000***	11.27 ± 3.04	p=0.479*
40-65 years (c)	12.59 ± 2.94	**a>c**	7.04 ± 2.46	**a>b, a>c, b>c**	4.62 ± 1.73	**a>c, b>c**	11.53 ± 2.69	
Marital status								
Married	12.72 ± 2.89	t=-2.792	7.42 ± 2.37	t=-6.082	4.90 ± 1.84	t=-4.693	11.50 ± 2.77	t=1.475
Single	13.48 ± 2.27	df=-355.831 **p=0.006****	8.95 ± 2.33	df=366 **p=0.000****	5.76 ± 1.63	df=337.125 **p=0.000****	11.06 ± 2.82	df=366 p=0.141**
Income status								
Income less than expenses	13.24 ± 2.46	F=0.777 p=0.461*	8.11 ± 2.38	F=2.502 p=0.083*	5.39 ± 1.85	F=0.519 p=0.596*	11.52 ± 3.00	F=1.477 p=0.230*
Income equal to expenses	12.88 ± 2.83		7.86 ± 2.46		5.18 ± 0.79		11.34 ± 2.68	
Income more than expenses	13.21 ± 2.39		8.87 ± 2.70		5.21 ± 1.76		10.57 ± 2.75	
Education status								
Primary/Junior high school (a)	11.84 ± 3.07	F=11.153 **p=0.000*** **b>a, c>a**	6.20 ± 2.47	F=31.187 **p=0.000*** **b>a, c>a**	4.29 ± 1.83	F=15.030 **p=0.000*** **b>a, c>a**	12.57 ± 2.99	F=10.599 **p=0.000*** **a>b, a>c**
Senior high school (b)	13.57 ± 2.54		8.43 ± 2.34		5.40 ± 1.80		11.17 ± 2.53	
Higher education (c)	13.11 ± 2.40		8.60 ± 2.12		5.60 ± 1.62		10.83 ± 2.76	
Smoking								
Yes (a)	13.25 ± 2.68	F=0.811 p=0.445*	8.29 ± 2.47	F=0.982 p=0.375*	5.58 ± 1.76	F=3.847 **p=0.022*** **a>b**	11.09 ± 2.94	F=0.840 p=0.433*
No (b)	12.96 ± 2.71		7.90 ± 2.47		5.06 ± 1.81		11.46 ± 2.72	
Quit (c)	12.47 ± 2.21		8.17 ± 2.37		5.70 ± 1.75		10.94 ± 2.92	
Alcohol								
Yes	13.73 ± 2.28	t=2.416 df=366 **p=0.016****	9.42 ± 2.16	t=5.328 df=366 **p=0.000****	6.14 ± 1.66	t=4.639 df=366 **p=0.000****	10.36 ± 2.92	t=-3.183 df=366 **p=0.002****
No	12.87 ± 2.74		7.72 ± 2.43		5.05 ± 1.78		11.55 ± 2.72	
Having a child								
Yes	12.63 ± 2.93	t=-3.510	7.33 ± 2.39	t=-6.820	4.85 ± 1.85	t=-5.207	11.45 ± 2.76	t=1.007

	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test
No	13.57 ± 2.19	df=365.926 **p=0.001****	8.99 ± 2.25	df=344.898 **p=0.000****	5.79 ± 1.60	df=356.158 **p=0.000****	11.16 ± 2.85	df=366 p=0.315**
Having gynecologic examination regularly								
Yes	13.46 ± 2.57	t=1.603 df=366 p=0.110**	8.32 ± 2.62	t=1.148 df=366 p=0.252**	5.37 ± 1.95	t=0.654 df=366 p=0.513**	11.20 ± 3.02	t=-0.449 df=366 p=0.654**
No	12.91 ± 270		7.95 ± 2.42		5.22 ± 1.77		11.36 ± 2.73	

*One way ANOVA, **independent t test, a,b,c Bonferroni test

Table 2. The Relationship Between the Participants' HPV Knowledge and the Mean Scores They Obtained from the HBMS-HPVV and its Sub-dimensions

Characteristics	Perceived Severity		Perceived Benefits		Perceived Susceptibility		Perceived Barriers	
	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test
Having heard about the HPV								
Yes	13.06 ± 2.66	t=2.283 df=366 **p=0.023****	8.05 ± 2.46	t=1.455 df=366 p=0.147**	5.25 ± 1.80	t=0.281 df=366 p=0.779**	11.29 ± 2.78	t=-2.472 df=366 **p=0.014****
No	10.00 ± 3.36		6.25 ± 2.50		5.00 ± 2.16		14.75 ± 1.70	
Being knowledgeable about the HPV								
Yes	13.56 ± 2.01	t=2.609 df=213.342 **p=0.010****	9.42 ± 2.06	t=7.019 df=175.709 **p=0.000****	6.25 ± 1.42	t=7.167 df=188.652 **p=0.000****	10.35 ± 2.94	t=-3.876 df=366 **p=0.000****
No	12.85 ± 2.85		7.58 ± 2.42		4.92 ± 1.80		11.64 ± 2.68	
Having heard about the HPV test								
Yes	13.25 ± 2.59	t=3.314 df=366 **p=0.001****	8.19 ± 2.42	t=2.625 df=366 **p=0.009****	5.42 ± 1.80	t=3.788 df=366 **p=0.000****	11.24 ± 2.87	t=-1.272 df=366 p=0.204**
No	12.08 ± 2.87		7.34 ± 2.54		4.52 ± 1.65		11.71 ± 2.43	
Being knowledgeable about the HPV test								
Yes	13.59 ± 2.12	t=1.829 df=366 p=0.068**	9.64 ± 1.92	t=6.873 df=105.112 **p=0.000****	6.17 ± 1.40	t=5.369 df=107.108 **p=0.000****	10.04 ± 3.27	t=-4.039 df=366 **p=0.000****
No	12.91 ± 2.77		7.70 ± 2.44		5.06 ± 1.82		11.59 ± 2.62	
Being vaccinated against HPV								
Yes	13.68 ± 1.99	t=1.002 df=366 p=0.317**	9.18 ± 2.13	t=1.913 df=366 p=0.057**	5.93 ± 1.73	t=1.551 df=366 p=0.122**	9.37 ± 3.68	t=-2.886 df=366 **p=0.004****
No	13.00 ± 2.71		7.98 ± 2.47		5.22 ± 1.80		11.42 ± 2.72	

**independent t test

susceptibility and benefits. The participants who were primary/junior high school graduates obtained a higher mean score from the perceived barriers sub-dimension than did the participants who were senior high school or higher education graduates (Table 1).

Of the participants, those who received training on HPV and those who heard of HPV testing perception obtained statistically high scores from the perceived severity, susceptibility and benefits sub-dimensions of the HBMS-HPVV. While the participants who heard about HPV testing, who received training on HPV, who received training on HPV vaccination and who were vaccinated against HPV obtained lower mean scores from the perceived barrier sub-dimension, the participants who had heard about HPV obtained higher mean scores from the perceived barrier sub-dimension of the. HBMS-HPVV. The participants who received training on HPV vaccination obtained significantly higher mean scores from the perceived benefits and perceived susceptibility sub-dimensions of the HBMS-HPVV (Table 2).

The HLS and its sub-dimensions are as follows: HLS total score: 108.60 ± 14.31 (min: 51, max: 125), application/usage sub-dimension: 20.79 ± 3.95 (min:5, maks: 25), access to information sub-dimension: 22.51 ± 3.27 (min: 8, max: 25), understanding information sub-dimension: 29.83 ± 5.02 (min:12, max: 35), evaluation/appraisal sub-dimension: 35.47 ± 5.03'tür (min: 11, max: 40) (Data not shown). Of the participants, those who were in the age group of 18-24 and those who were graduates of senior high school or higher education obtained significantly higher mean scores from the access to information, understanding information, evaluation/appraisal and application/usage sub-dimensions of the HLS than did those who were in the age group of 40-65 years and those who were graduates of junior high school. The participants whose income was less than their expenses obtained lower scores from the understanding information, evaluation/appraisal and application/usage sub-dimensions of the HLS than did the participants whose income was equal to their expenses. The participants who did not have children obtained higher scores from the access to information and understanding information sub-dimensions of the HLS than did the participants who had children. The single participants obtained a statistically significantly higher mean score from the understanding information sub-dimension of the HLS than did the married participants (Table 3).

Of the participants, those who received training on HPV, those who received training on the HPV vaccine, those who heard of the HPV test and those who were vaccinated against HPV obtained statistically higher mean scores from the understanding information, application/usage and evaluation/appraisal sub-dimensions of the HLS. Those who had gynecological examinations regularly, those who received training on HPV, those who received training on the HPV vaccine and those who were vaccinated against HPV obtained higher mean scores from the access to Information sub-dimension of the HLS. Those who did not have gynecological examinations regularly obtained a lower mean score from the evaluation/appraisal and application/usage sub-dimension of the HLS. HLL were higher in those who were in the age group of 18-24 years, those who were single, those who had an income equal to their expenses, those who were employed, those who were graduates of senior high school or higher education, those who drank alcohol, those who did not have children, those who had gynecological examinations regularly, those who received training on HPV, those who received training on the HPV vaccine, those who heard of the HPV test and those who were vaccinated against HPV (Table 4).

There was a positive high correlation between the mean score for the HLS total score and the mean scores for its access to information understanding information, evaluation/appraisal and application/usage sub-dimensions, whereas there was a weak positive correlation between the mean score for the HLS total score and the mean scores for the perceived severity, susceptibility and benefits sub-dimensions of the HBMS-HPVV. There was a very weak negative correlation between the mean score for the HLS total score and the mean score for the perceived barriers sub-dimension of the HBMS-HPVV (Table 5).

DISCUSSION

The mean scores obtained from the perceived severity, susceptibility and benefits sub-dimensions of the HBMS-HPVV by the participants in the age group of 18-24 years were statistically significantly higher than were those obtained by the participants in the age group of 40-65 years. Similarly, in several studies, the participating women in the younger age group obtained higher mean scores from the perceived benefits (Koç, Baltacı, & Yüksekol, 2023; Çınar

Table 3. The Relationship Between the Participants' Sociodemographic Characteristics and the Mean Scores They Obtained from the HLS Total Score and its Sub-dimensions

Characteristics	Access to information		Understanding information		Appraisal/ evaluation		Application/ usage		Health literacy total score	
	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test
Age										
18-24 years (a)	22.85 ± 2.78	F=5.190	31.28 ± 3.97	F=13.600	35.86 ± 4.48	F=3.104	21.57 ± 3.45	F=4.990	111.58 ± 12.27	F=8.976
25-39 years (b)	23.01 ± 2.73	**p=0.006***	30.46 ± 4.54	**p=0.000***	36.09 ± 4.40	**p=0.046***	20.99 ± 3.39	**p=0.007***	110.56 ± 12.11	**p=0.000***
40-65 years (c)	21.83 ± 3.88	**a>c, b>c**	28.22 ± 5.64	**a>c, b>c**	34.66 ± 5.78		20.03 ± 4.58	**a>c**	104.75 ± 16.47	**a>c, b>c**
Marital status										
Married	22.35 ± 3.42	t=-1.101	29.23 ± 5.24	t=-2.797	35.18 ± 5.34	t=-1.343	20.49 ± 4.16	t=-1.746	107.28 ± 14.94	t=-2.189
Single	22.74 ± 3.04	df=366	30.72 ± 4.53	df=366	35.90 ± 4.51	df=366	21.23 ± 3.59	df=366	110.59 ± 13.12	df=366
		p=0.272**		**p=0.005****		p=0.180**		p=0.082**		**p=0.029****
Income status										
Income less than expenses	22.00 ± 3.61	F=2.024 p=0.134*	28.87 ± 5.78	F=3.171 **p=0.043*** **b>a**	34.42 ± 5.69	F=4.000 **p=0.019*** **b>a**	19.91 ± 4.24	F=4.281 **p=0.015*** **b>a**	105.22 ± 16.12	F=4.916 **p=0.008*** **b>a**
Income equal to expenses	22.74 ± 3.06		30.27 ± 4.41		36.04 ± 4.45		21.19 ± 3.76		110.25 ± 12.51	
Income more than expenses	22.75 ± 3.28		30.30 ± 5.56		35.39 ± 5.73		21.24 ± 3.71		109.69 ± 16.87	
Employment status										
Employed	23.26 ± 2.79	t=3.913	31.22 ± 4.24	t=4.775	37.05 ± 3.68	t=5.612	21.73 ± 3.23	t=4.138	113.27 ± 10.85	t=5.809
Unemployed	21.97 ± 3.49	df=361.044 **p=0.000****	28.84 ± 5.29	df=361.716 **p=0.000****	34.34 ± 5.54	df=364.408 **p=0.000****	20.11 ± 4.27	df=364.608 **p=0.000****	105.28 ± 15.52	df=365.901 **p=0.000****
Education status										
Primary/ Junior high school (a)	20.40 ± 4.22	F=23.421 **p=0.000*** **b>a, c>a**	25.75 ± 5.09	F=42.440 **p=0.000*** **b>a, c>a, c>b**	32.87 ± 6.04	F=16.463 **p=0.000*** **b>a, c>a**	18.20 ± 4.87	F=24.468 **p=0.000*** **b>a, c>a**	97.23 ± 16.13	F=40.163 **p=0.000*** **b>a, c>a**
Senior high school (b)	22.83 ± 2.83		30.25 ± 4.64		35.55 ± 4.98		21.15 ± 3.53		109.80 ± 13.03	
Higher education (c)	23.30 ± 2.59		31.57 ± 4.08		36.78 ± 3.86		21.79 ± 3.17		113.46 ± 10.92	
Alcohol										
Yes	23.08 ± 2.47	t=1.969	31.44 ± 3.57	t=3.736	35.88 ± 4.87	t=0.742	21.38 ± 3.39	t=1.533	111.79 ± 11.28	t=2.422
No	22.38 ± 3.42	df=132.014 p=0.051**	29.46 ± 5.23	df=140.348 **p=0.000****	35.38 ± 4.07	df=366 p=0.458**	20.65 ± 4.06	df=115.138 p=0.128**	107.88 ± 14.83	df=125.458 **p=0.017****
Having a child										
Yes	22.16 ± 3.56	t=-2.426 df=364.434 **p=0.016****	28.98 ± 5.46	t=-4.004 df=364.858 **p=0.000****	35.13 ± 5.49	t=-1.571 df=364.344 p=0.117**	20.55 ± 4.09	t=-1.324 df=366 p=0.186**	106.84 ± 15.37	t=-2.777 df=366 **p=0.006****
No	22.97 ± 2.79		30.98 ± 4.09		35.93 ± 4.31		21.10 ± 3.75		111.00 ± 12.39	
Having gynecologic examination regularly										
Yes	23.32 ± 3.18	t=2.514 df=124.356 **p=0.013****	30.44 ± 4.68	t=1.224 df=366 p=0.222**	36.80 ± 3.76	t=3.214 df=167.286 **p=0.002****	21.51 ± 3.24	t=2.083 df=150.324 **p=0.039****	112.08 ± 12.20	t=2.713 df=143.179 **p=0.007****
No	22.29 ± 3.27		29.66 ± 5.10		35.11 ± 5.27		20.59 ± 4.11		107.66 ± 14.71	

*One way ANOVA, **independent t test, a,b,c Bonferroni test

Table 4: The Relationship between Women's HPV Knowledge and HL

	Access to information		Understanding information		Appraisal/ evaluation		Application/ usage		Health literacy total score	
	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test	Mean ± SD	Test
Being knowledgeable about the HPV										
Yes	23.74 ± 2.23	t=5.198	32.67 ± 3.15	t=8.287	37.73 ± 3.39	t=6.271	22.54 ± 2.81	t=6.020	116.70 ± 9.31	t=8.126
No	22.11 ± 3.46	df=235.167 p=0.000**	28.91 ± 5.16	df=250.255 p=0.000**	34.74 ± 5.26	df=235.620 p=0.000**	20.22 ± 4.10	df=220.626 p=0.000**	105.98 ± 14.68	df=239.856 p=0.000**
Having heard about the HPV test										
Yes	22.54 ± 3.33	t=0.435	30.30 ± 4.78	t=3.831	35.88 ± 4.84	t=3.024	21.17 ± 3.70	t=3.439	109.91 ± 13.73	t=3.674
No	22.35 ± 3.05	df=366 p=0.664**	27.80 ± 5.51	df=366 p=0.000**	33.72 ± 5.47	df=95.965 p=0.003**	19.15 ± 4.56	df=91.485 p=0.001**	103.04 ± 15.48	df=366 p=0.000**
Being knowledgeable about the HPV test										
Yes	24.09 ± 1.93	t=6.093	33.09 ± 3.06	t=8.090	38.22 ± 3.18	t=6.612	22.79 ± 2.71	t=5.788	118.20 ± 8.36	t=8.570
No	22.18 ± 3.40	df=150.029 p=0.000**	29.16 ± 5.08	df=139.588 p=0.000**	34.91 ± 5.16	df=135.513 p=0.000**	20.38 ± 4.04	df=123.264 p=0.000**	106.66 ± 14.49	df=146.833 p=0.000**
Being vaccinated against HPV										
Yes	22.81 ± 0.54	t=10.796	33.37 ± 2.50	t=5.444	38.87 ± 1.45	t=7.840	22.75 ± 2.20	t=3.464	119.81 ± 5.11	t=7.856
No	22.40 ± 3.31	df=96.532 p=0.000**	29.67 ± 5.04	df=21.048 p=0.000**	35.31 ± 5.08	df=35.834 p=0.000**	20.70 ± 3.99	df=19.795 p=0.002**	108.09 ± 14.39	df=27.592 p=0.000**

**independent t test

Table 5. Correlation between HLS and HBMS-HPVV's Sub-dimensions

	Perceived Benefits	Perceived Susceptibility	Perceived Barriers	Access to information	Understanding information	Appraisal/ evaluation	Application /usage	Health literacy Scale total score
Perceived Severity	0.346* **0.000**	0.431* **0.000**	-0.002* 0.963	0.271* **0.000**	0.214* **0.000**	0.245* **0.000**	0.170* **0.001**	0.270* **0.000**
Perceived Benefits		0.657 **0.000**	-0.372* **0.000**	0.307* **0.000**	0.406 **0.000**	0.268* **0.000**	0.319* **0.000**	0.396* **0.000**
Perceived Susceptibility			-0.209* **0.000**	0.309* **0.000**	0.315* **0.000**	0.262* **0.000**	0.253* **0.000**	0.343* **0.000**
Perceived Barriers				-0.194* **0.000**	-0.221* **0.000**	-0.161* **0.002**	-0.154* **0.003**	-0.221* **0.000**
Access to information					0.585* **0.000**	0.645* **0.000**	0.402* **0.000**	0.772* **0.000**
Understanding information						0.667 **0.000**	0.537* **0.000**	0.868* **0.000**
Appraisal/ evaluation							0.549* **0.000**	0.885* **0.000**
Application/ usage								0.750* **0.000**

* Pearson correlation analysis; r: correlation efficient (r=0.000-0.25 very low, r=0.26-0.49 low, r=0.50-0.69 moderate, r=0.70-0.89 high, r=0.90-1.00 very high correlation)

& Çetin, 2024), perceived severity (Çınar & Çetin, 2024) and susceptibility (Çınar & Çetin, 2024) sub-dimensions of the HBMS-HPVV than did the participating women in other age groups, which may indicate that young women are more conscious and sensitive on this issue and that health education and information campaigns are perhaps effective. These trends should be taken into consideration when health policies and education strategies are developed. In the present study, the participants who were graduates of senior high school or higher education obtained statistically significantly higher scores from the perceived severity, susceptibility and benefits sub-dimensions of the HBMS-HPVV than did the participants who were graduates of primary school or junior high school. In Koç et al.'s study (2023), university graduates obtained higher scores from the perceived benefits, susceptibility, and severity sub-dimensions (Koç et al., 2023). In Arı's study (2021), those who had the master's degree obtained statistically significantly higher mean scores from the perceived benefits sub-dimension of the HBMS-HPVV than did the senior high school graduates (Arı, 2021). In Yıldız et al.'s study (2023), the junior high school graduates obtained higher scores from the perceived benefits sub-dimension of the HBMS-HPVV than did the primary school graduates (Yıldız et al., 2023). In Çınar and Çetin's study (2024), the mean scores obtained from the perceived severity, susceptibility and benefits sub-dimensions of the HBMS-HPVV increased as the participants' level of education increased (Çınar & Çetin, 2024). These results may provide significant data for health professionals to increase the effectiveness of health education programs and interventions. In the present study, the single and childless participants obtained higher scores from the perceived severity, susceptibility and benefits sub-dimensions of the HBMS-HPVV. In several studies whose results were consistent with those of the present study, the single (Koç et al., 2023) and childless (Koç et al., 2023; Çınar & Çetin, 2024) participants obtained higher scores from the perceived susceptibility sub-dimension of the HBMS-HPVV. However, in some studies whose results were different from those of the present study, the married participants obtained higher scores from the perceived susceptibility (Kılınç İşleyen et al., 2024; Çınar & Çetin, 2024) and perceived benefits (Arı, 2021) sub-dimensions of the HBMS-HPVV. The effects of factors such as education level, marital status, and having

children on health perceptions may be complex and may vary from one group to another. These results may indicate that health education and intervention strategies should be customized according to the target audience. It should be taken into account that each individual's health perceptions and needs may differ.

In the present study, the analysis of the participants' perceptions of barriers regarding HPV and the HPV vaccine revealed that those who were primary school or junior high school graduates obtained a higher mean score from the perceived barriers sub-dimension of the HBMS-HPVV than did those who were graduates of senior high school education or higher education. In studies whose results were consistent with those of the present study, the participating women's perceived barriers scores decreased as their level of education increased (Gürdal, 2021; Topkara & Dagli, 2023; Çınar & Çetin, 2024). As in the present study, in several studies in the literature, the mean score obtained from the perceived barriers sub-dimension by the participating women was lower in those who heard about the HPV test (Ergün, 2023; Koç et al., 2023), those who received education on HPV and the HPV vaccine (Topkara & Dagli, 2023), and those who were vaccinated against HPV (Arı, 2021; Gürdal, 2021). Again, as in the present study, in some other studies, the participating women who received education about HPV and heard about HPV testing obtained statistically higher scores from the perceived severity (Muturi, 2020; Gürdal, 2021; Ergün, 2023; Koç et al., 2023), perceived benefits (Gürdal, 2021; Ergün, 2023; Koç et al., 2023;) and perceived susceptibility (Gürdal, 2021; Ergün, 2023; Koç et al., 2023) sub-dimensions of the HBMS-HPVV. Expanding education programs and information campaigns about HPV may increase the rates of women agreeing with having HPV testing and vaccination, and may reduce their perceived barriers levels.

In the present study, the analysis of the mean scores obtained from the sub-dimensions of the HBMS-HPVV demonstrated that as in many studies in the literature, while the participants' perceived barriers sub-dimension score was below the average, their scores for the perceived severity, susceptibility and benefits sub-dimensions were above the average (Arı, 2021; Gürdal, 2021; Yarıcı & Mammadov 2023; Koç et al., 2023; Sezgin, Salimoğlu, Başaran, & Akdur, 2024; Çınar & Çetin, 2024). In the present study,

the fact that the scores obtained by the participants from the perceived severity, susceptibility and benefits sub-dimensions of the HBMS-HPVV were above the average indicates that they developed a high level of awareness of and a positive attitude towards these issues. The fact that the mean score the participants obtained from the perceived barrier sub-dimension was below the average might indicate that their levels of perceptions regarding barriers related to the HPV vaccine and HPV testing were low and that their levels of awareness on these issues were high. These results highlight the importance of health education programs and awareness campaigns aimed at improving attitudes towards HPV vaccination and HPV testing.

In the present study, the HLL of the participants who were in the age group of 18-24 years, single, who had income equal to expenses, who were employed, who had senior high school or higher education, who had no children and who had gynecological examinations regularly were higher. Similarly, in a study conducted by Minamitani, Morishima, Katano, Ohira, & Nakagawa (2024) in Japan, HLL were higher in the participating women who had higher education and who had higher income levels (Minamitani et al., 2024). In other studies conducted in Türkiye whose results are consistent with the results of the present study, the participants whose HLL were high were single (Yüce & Muz, 2023), young (Yilmazel, 2019; Akbaş, 2022; Yüce & Muz, 2023), had a high level of education (Yilmazel, 2019; Akbaş, 2022; Yüce & Muz, 2023), had a good income (Akbaş, 2022; Yüce & Muz, 2023) and were employed (Yilmazel, 2019; Akbaş, 2022; Yüce & Muz, 2023). To increase HLL, policies aimed at improving education and income status should be strengthened. Increasing opportunities to access health information and education can also improve HLL. These results highlight that implementing strategies for accessing health education and information according to demographic factors are of importance.

In the present study, HLL of the participants who received education about HPV and the HPV vaccine, who heard about the HPV test, and who were vaccinated against HPV were high. Similarly, in studies conducted in the United States (Albright & Allen, 2018; Kitur et al., 2022; Bynum et al., 2013) and Türkiye (Yilmazel, 2019; Akbaş, 2022), those who heard of HPV and the HPV vaccine (Bynum et al., 2013; Albright &

Allen, 2018; Yilmazel, 2019; Akbaş, 2022; Kitur et al., 2022) and those who were knowledgeable about HPV and the HPV vaccine (Albright & Allen, 2018; Akbaş, 2022; Kitur et al., 2022) had higher HLL. These results support the importance of health education and information distribution in increasing HLL.

The mean score obtained from the HLS total score was 108.60 ± 14.31, indicating that the participants' HLL were adequate. In studies conducted in Türkiye, the participants' e-HLL was moderate in Kılınç İşleyen et al.'s study (2024) (Kılınç İşleyen et al., 2024), and HLL was low in the majority of the participating women in Yilmazel's study (2019) (Yilmazel, 2019) and sufficient in Yüce & Muz's study (2023) (Yüce & Muz, 2023). As for the international literature, the e-HLL was moderate in a study conducted in Kenya (Muturi, 2020), and HLL was on the borderline in young adults in a study conducted in the United States (Albright & Allen, 2018), adequate in the participating women in a study conducted in Malaysia (Baharum, Ariffin, Isa, & Tin, 2020) and inadequate in more than half of the participants in a study conducted in Japan (Minamitani et al., 2024). The fact that women's HLL was low in some studies and adequate in others indicates that women have different opportunities in accessing and using health information. It is emphasized that if HLL are to be improved, training programs should be organized, and public's awareness should be raised.

In the present study, a weak positive correlation was determined between the mean scores obtained from the HLS total score and the perceived severity, susceptibility and benefits sub-dimensions of the HBMS-HPVV. All these indicate that individuals can better comprehend health risks and benefits as they understand and use health information better, but this increase in awareness may depend on factors which are more complex.

Limitation

The present study has several limitations. The results of the present study cannot be generalized to all women and these results might not represent the relationship between women's HLL, and their health beliefs about HPV and vaccine across the country.

CONCLUSION

A positive relationship was determined between

HL and perceived severity, susceptibility and benefits. Within this context, it is important to organize education programs and information campaigns to increase HLL and to raise awareness about HPV and vaccine. Developing special programs especially for women whose education level was low and women who were unemployed can be effective in increasing their HL and perception levels. Health professionals can contribute to increasing women's general HL knowledge levels by providing guidance to help them understand and implement health information better.

Ethics Committe Approval

Author Contributions

Idea/Concept: J.A.H., A.K.S.; Design: J.A.H., A.K.S.; Supervision/Consulting: J.A.H., A.K.S.; Analysis and/or Interpretation: J.A.H., A.K.S.; Literature Search: J.A.H., A.K.S.; Writing the Article: J.A.H., A.K.S.; Critical Review: A.K.S.

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Conflict of Interest

The authors have no conflict of interest to declare.

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