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The Level of Knowledge about Human Papillomavirus Infection and Vaccination Among Mothers of Children Aged 11-18 Years of Age

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Abstract

Objective: The aim is to investigate the knowledge, awareness, attitudes, and behaviors of mothers of children in terms of human papillomavirus (HPV) infection, its association with cervical cancer, and HPV vaccination. It is estimated that cervical cancer is the second most common cancer among women worldwide, and it is one of the most preventable diseases, according to World Health Organization reports. HPV vaccination rates are relatively minimal in Turkey. The lack of parental awareness of HPV infection is a possible most critical factor that drives vaccination rates.

Methods: The study included 1,023 healthy volunteer women who had at least one child aged 11-18 years. A self-explanatory questionnaire comprising of 14 questions was designed to assess and compare maternal awareness and behavior regarding HPV infection and HPV vaccine.

Results: The study showed that a majority of the responders (68%) were aware of cervical cancer, minor of them (<22%) were aware of HPV vaccination. Less than half (32.81%) of the parents were found to be willing to vaccinate their children against HPV infection. The primary reason for non-vaccination was a lack of knowledge and concerns about side effects.

Conclusion: The current survey demonstrates that parents have a comparatively high level of knowledge about HPV and its association with cervical cancer; however, acceptance of vaccination is low. The study highlights the necessity of developing public education politics to achieve a deep awareness of parents about HPV vaccination in the community.

Keywords: Child, human papillomavirus, knowledge, mothers, vaccines

INTRODUCTION

Papillomaviruses are highly species-specific, and human papillomavirus (HPV) affect only humans. According to their tissue tropism, there are more than 200 types of HPV, which are subdivided into cutaneous and mucosal categories (1). HPV is a sexually transmitted pathogen that causes anogenital and oropharyngeal disease in males and females. Anogenital HPV is globally the most common sexually transmitted infection. The peak prevalence of HPV infection typically occurs within the first decade after sexual debut (2).

Evidence linking HPV to cervical carcinoma is significant; the high-risk HPV genotypes 16 and 18 cause approximately 70 per cent of all cervical cancers worldwide (2,3). Knowledge of HPV and its effect on invasive cervical cancer is crucial to introducing prophylactic vaccines. Virtually all cases of cervical cancer are attributable to HPV infection that makes the vaccination of vital importance. In resource-limited settings, expert groups recommend that public health efforts focus primarily on vaccinating young females, the group in whom the full benefit and cost-effectiveness of HPV vaccination is the highest. The introduction of routine HPV vaccination of adolescents and young adults has been associated with a decline in the burden of HPV infection and HPV-associated disease and quality of life (4).

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Cervical cancer is the second most common cancer among women worldwide, with approximately 530,000 diagnosed invasive cases and 260,000 deaths annually (5,6). HPV vaccination is effective in preventing cervical disease. Vaccine efficacy is highest in those without a prior HPV infection (7). This knowledge has been demonstrated in large randomized trials and has been supported by population data from regions reporting declines in cervical disease incidence following widespread quadrivalent HPV vaccination.

We assessed parents' knowledge status about HPV infection, attitudes toward HPV vaccination for their children and to estimate factors associated with parental acceptance toward HPV immunization. The Turkish Gynecological Oncology Association and the Turkish Pediatric Association formally recommend immunization against HPV. Both types of HPV vaccines have been available in Turkey since 2007. HPV vaccines are available in Turkey; however, they are not covered by the routine national childhood immunization program. Therefore, it is estimated that HPV vaccination rates are rather minimal in Turkey (8). Parents' knowledge of HPV infection is quite likely the most critical factor that drives vaccination rates. In the present study, we evaluated parents' knowledge levels about HPV infection, attitudes toward HPV vaccination for their children and estimate factors associated with parental acceptance regarding HPV immunization.

METHODS

Study Group

All participants provided informed written consent to take part in our survey. Healthy mothers of pediatric patients admitted to the pediatric outpatient clinic of the department of pediatric health and diseases, medical faculty hospital, between January and July 2018, were invited to take a single survey. Mothers of children aged under 18 years of age and of both genders were included. One thousand twenty three women participated in the questionary that lasted a median duration of 20 min. Women who had to read and understand the questionnaire on their own or with the help of staff were given the paper-based questionnaire to complete themselves and then return to the team.

Study Design

A descriptive, comparative design was used to examine mothers' perceptions and knowledge of HPV and attitudes toward the HPV vaccine. This method provided insight into parental decision-making and explored vaccine initiation by parents as recommended preventive action.

Participants were recruited for a paper survey. Inclusion criteria were healthy parents (mothers) who had children or adolescents between 11 and 18 years of age. The exclusion criteria were as Parents with a history of any gynecological cancer, parents older than 65 years.

Survey Data

A questionnaire comprising of 14 questions was designed to assess parental awareness, knowledge, and attitudes regarding HPV disease, its association with cervical cancers, and HPV vaccine.

The study questionnaires consisted of demographic items, social and economic status of the participants. Demographic questions included gender, household income, education level, parent's age, number of children, and age. The survey included general HPV knowledge, cervical cancer knowledge items, HPV vaccination knowledge and immunization perception items. The questionnaire included questions as following:

- Demographic items: Age (both mother and the child), gender, education, socioeconomic status (household income),

- Knowledge of HPV infection, HPV related cervical cancer, gynecological follow-up, HPV vaccines,

- Attitudes and behavior regarding HPV vaccination for their child and the reasons for hesitation regarding immunization,

- The source of their knowledge on the topics above.

Ethical Issues

The Duzce University Faculty of Medicine Ethics Committee approved the study following the Word Medical Association Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects (decision no: 2018/48, date: 05.03.2018).

Statistical Analysis

Collected data of 1,023 completed surveys were analyzed using SPSS 15.0. Frequencies and descriptive statistics were used to evaluate the participants' demographic data, knowledge about HPV infection, and vaccine acceptance. Chi-square tests were used to examine the differences among demographic questions, HPV knowledge, and perceptions of chi-square nation. A p value of <0.05 was set for all statistical tests to determine significance. Relations between respondents' character analyses for which the associated $p<0.05$ was then used in correlation tests. The level of knowledge or vaccine acceptance was explored in a univariate analysis using the chi-square test. Factors in the univariate analysis for which the associated $p<0.05$ was then used in multivariate logistic regression.

RESULTS

Demography

Overall, 1,023 subjects were enrolled in the study, and all the participants completed the study questionnaire.

The mean age of the responders and children were 40 and 14 years of age, respectively. Twenty-two (2.3%) of the mothers were illiterate, and 115 (8.6%) graduated from a university. Monthly household income was commonly in the 1500-3000 TL range in most participants, 420 out of 1,023 (41.4%) responders. Most of the participants, 984 (96.2%), had health insurance. Table 1 presents the demographic and socioeconomic (data about education, occupation, monthly household income, and social security) characteristics of mothers and their children with whom they admitted to the pediatric clinics are presented in detail.

Knowledge and Behavior

Socioeconomic features play a significant role in being aware of cervical cancer and HPV. Parents of girl children (n=194, 30.89%) were significantly more willing to vaccinate their children against HPV than parents who had a boy child (n=143, 36.20%). We report that as the mother's education levels decreased, the number of parents who were willing to vaccinate her child decreased the number of illiterate mothers who were willing to vaccinate their children was 9 (0.87%). Household income was negatively associated with acknowledgment of cervical cancer and the HPV vaccine and negatively associated with willingness to immunate their child. The lower was the household income, the fewer parents were informed and to be willing for immunization. Regular gynecological check-up of the parent with pap-smear testing history was strongly and positively correlated with the acknowledgment of cervical cancer, the HPV vaccine, and the willingness to immunate their child.

Table 1. Socio-demographic features of responders

	Count N=1023	Percentage (%)
Age#		
Parent	40±6	
Child	14±1.6	
Child gender		
Male	395	38.6
Female	628	61.4
Education		
Illiterate	24	2.3
Primary school	362	35.4
Middle school	236	23.1
High school	286	28.0
University	115	8.63
Parents employment status		
Unemployed	738	72.1
Employed (private)	137	13.4
Employed (government)	93	9.1
Others	55	5.4
Household income+		
0-1500	239	23.4
1500-3000	420	41.1
>3000	364	35.6
Health insurance		
Present	984	96.2
None	39	3.8

#Years, values are presented as mean ± standard deviation, +Monthly, values in Turkish currency

Table 2 shows the impact of demographic and socio-economical features on the acknowledgment of cervical cancer, HPV, and HPV vaccine acceptance in detail.

In our study, few participants had less family history of cervical cancer or genital warts (n=18, 1.8%).

Sources of Information

We investigated the primary accessibility of knowledge on cervical cancer and HPV immunization. We also evaluated the reasons for parents not to accept vaccinating their children. We reported health providers as the most accessible source of knowledge and lack of information as the most dominant (24.16% of the responses) for avoiding vaccination. The most common source of information about HPV infection and cervical cancer among mothers were health professionals: n=134, 59.27% and n=389, 55.81%, respectively. Table 3 presents these data in detail.

DISCUSSION

This study was conducted to assess the awareness and knowledge regarding cervical cancer and HPV infection and to evaluate attitudes toward HPV vaccination among the parents of children aged 11-18 years of age. We summarize our results; it was evident that the level of knowledge regarding HPV infection and awareness of its association with cervical cancer was insufficient among parents with at least one child aged 11-18 years. The lack of knowledge on HPV vaccination and its probable side effects are the main reasons for vaccination hesitation.

Parental Awareness of HPV Infection and the Effect of Demographic Features

When comparing the number of participants, this study was one of the most comprehensive survey studies recently presented in the literature. Even though this study does not contribute a lot of

new information, it emphasizes informing society about the HPV vaccine, and we objected these data might provide useful insight into western Turkey. Considering that this study was conducted in the western part of Turkey, participants in our study are insufficient to reflect the Turkey women population in general.

Study Limitations

This is a limitation of our study. Nevertheless, the high number of survey participants increases the value of the study results to the general literature knowledge. And this is the strenghtest value of our study.

The vast majority of participants (68.1%) in our study were aware of cervical cancer, few (21.6%) were aware of HPV vaccination and associated with cervical cancer, and even fewer participants were the percentage of parents who were willing to vaccinate their children. Our study's first observations showed that the awareness of cervical cancer and HPV did not transform into acceptance of vaccination. Nevertheless, the number (percentage) of participants aware of cervical cancer and HPV in our study was much higher than in some previous reports from China, Malacia, Nigeria (1,9-11). Again, there were many reports from Thailand and Australia and showed the rate of knowledge of cervical cancer and HPV infection was as high as

Table 2. Demographic features of the participants and univariate analyses to identify factors associated with knowledge of cervical cancer, HPV vaccine, and acceptance of immunization for their children

Variables	All participants	Informed of cervical cancer		Informed of HPV		Willing for immunization	
	N (%)	N (%)	p	N (%)	p	N (%)	p
Age*							
27-39	474 (46.33)	313 (66.03)		91 (19.19)		159 (33.54)	
40-49	454 (44.37)	318 (70.04)	0.12	105 (23.13)	0.06	149 (32.81)	**0.03**
50-59	95 (9.28)	66 (69.47)		25 (26.31)		28 (29.47)	
Child gender							
Female	628 (61.38)	429 (68.31)	0.08	131(20.85)	0.06	194 (30.89)	**0.03**
Male	395 (38.61)	268 (67.84)		90 (22.78)		143 (36.20)	
Education							
Illiterate	24 (2.40)	8 (33.33)		2 (8.33)		9 (0.87)	
Primary school	362 (35.42)	226 (62.43)		56 (15.46)		110 (30.38)	
Middle school	236 (23.01)	152 (64.40)	**0.00**	33 (13.98)	**0.01**	67 (28.38)	**0.01**
High school	286 (28.03)	208 (72.72)		70 (24.47)		101(35.31)	
University	115 (8.63)	103 (89.56)		59 (51.30)		51 (44.34)	
Parents' employment status							
Unemployed	738 (72.1)	466 (60.43)		132 (17.88)		231 (31.30)	
Employed (private)	137 (13.04)	105 (76.64)	**0.00**	28 (20.43)	**0.01**	44 (32.11)	**0.02**
Government officials	93 (9.01)	80 (86.02)		40 (43.01)		43 (46.23)	
Others	55 (5.04)	47 (85.45)		22 (40)		22 (40)	
Household income+							
0-1500	239 (23.04)	138 (57.74)		30 (12.55)		66 (27.61)	
1500-3000	420 (42.10)	267 (63.57)	**0.02**	72 (17.14)	**0.00**	123 (29.28)	**0.04**
>3000	364 (35.60)	292 (80.21)		119 (32.69)		149 (35.43)	
Gynecological check-up							
Uncertain	658 (64.3)	413 (62.76)	**0.00**	114 (17.32)	**0.00**	175 (26.59)	**0.03**
Regular	365 (35.7)	284 (77.80)		107 (29.31)		162 (44.38)	
Pap testing undervent							
Never	338 (33)	197 (58.28)	**0.03**	55 (16.27)	**0.03**	75 (22.18)	0.05
Regular	685 (67)	500 (72.99)		166 (24.23)		262 (38.24)	

#Years, values are presented as mean ± standard deviation, +Monthly, values in Turkish currency, HPV: Human papillomavirus

65-85% (12,13). The geographic location did not seem to play a role in the awareness of the population about HPV and cervical cancer. The dissemination of knowledge about HPV is still a global problem.

The potential relationship between the demographic and socioeconomic features and HPV knowledge was an issue that needs more epidemiological and population studies.

In our study, we identified factors that were closely related to HPV and cervical cancer knowledge. The younger was the mothers, the higher educational attainment they had, the mother's employment status, the higher household income, history any gynecology control history, or Pap testing were the decisive factors for the women to be aware of cervical cancer and HPV vaccination. According to our study, the child's parental age and gender were not the critical factors to be more acknowledged in cervical cancer and HPV.

Table 3. Awareness and acceptance of HPV vaccination, evaluation of sources of knowledge

	Count (n)	Percentage (%)	p
Awareness of cervical cancer			
Yes	697	68.1	-
No	326	31.9	
The source of cervical cancer knowledge			
Neighborhood	118	16.92	**p<0.05**
Social media	190	27.25	
Health providers	389	55.81	
Awareness of HPV vaccination			
Yes	221	21.6	-
No	802	78.4	
The source of HPV knowledge			
Neighborhood	24	10.40	**p<0.05**
Social media	63	28.05	
Health providers	134	59.27	
Willing to vaccinate their children			
Yes	336	32.8	
No	687	67.2	
The reason to reject HPV vaccination (n=687)			
Price	21	3.05	**p<0.05**
Consider ineffective	42	6.11	
Feared of side effects	166	24.16	
Need to ask family	61	8.87	
Need more knowledge	375	54.58	
Others	22	3.20	

HPV: Human papillomavirus

Compared with previous reports, some researchers discussed that if parents were more educated and economically secured might have a higher chance of being exposed to awareness about cervical cancer and HPV rather than the general population (8). However, investigations conducted among the higher educated population or even among health providers showed that if parents are educated, employed, and have an adequate income, not always the criteria for are well acknowledged (14-18). Our reports once more emphasize the importance of global instruction and education of a poorly educated population, but all levels of the population about HPV and its potential risks. Some previous studies on education programs of the community on cervical cancer have reported positive incomes; improved awareness of cervical cancer led to improved knowledge of HPV association and increased perception of HPV immunization (19-21). Education campaigns on cervical cancer awareness should raise awareness of cancer and emphasize its link with the HP virus. Our study found that being aware of cervical cancer does not always acknowledge its association with HPV.

In our study, we found that the presence of cervical cancer history in the family or the presence of genital warts was not associated with HPV awareness levels; because very few (less than 2%) respondents presumably had a history of family cervical cancer history or genital warts around. Thus, we did not consider these data in our study.

Parental Vaccination Hesitations and Parent's Sources of Information About HPV and the Vaccination

The study's disappointing result was that despite quite high rates of awareness about cervical cancer, relatively minor (<33%), respondents were willing to vaccinate their children against the HPV disease. Willingness to protect their children seemed to be correlated with demographic and socioeconomic features of parents; the younger the mother was, the higher was the family economic income, and the higher was the education level of the mother, the more willing were she to accept immunizing her children after the correct information was given. These data undoubtedly once more emphasize the impact of health providers on the information on the population. Again, the gender of the breed seemed to have a reduced impact on awareness of cervical cancer; mothers of girl children were slightly more aware of cervical cancer and the HPV vaccination. However, the male gender significantly affected the willingness to immunize their child when vaccination was declared; a boy's mother was more likely to vaccinate their children.

Interestingly, being in common gynecological control or underwent Pap testing did not affect the acceptance of HPV

vaccination. Again, according to our study, the respondents' most common hesitance about not accepting the immunization was the need for further knowledge about HPV. Therefore, we observed that even if a woman was aware of her health problems in cervical cancer, it was not enough for her to decide whether her child's vaccination occurred. Moreover, although the impact of acknowledgment is emphasized, previous studies report different reasons for the family's vaccine rejection (22,23). We also questioned the women about the reasons for vaccine rejection, vaccine cost, belief in ineffectiveness, fear of side effect. However, our study results suggested that the lack of acknowledgment about the HPV vaccine was the most important reason not to accept the immunization. A low percentage of the responders (<22%) had been aware of preventing cervical cancer via vaccination. Among the responders who were aware of the vaccine, approximately 60% got the information from health providers, the less, got the knowledge via social media and television programs.

Health providers played a significant role in resolving the doubts about the HPV vaccination, but it was inadequate; raising public awareness should become government policy.

We observed several factors that positively correlated with willingness to vaccinate against HPV, and they were parental age, the gender of the child, educational background, household income, and employment status.

CONCLUSION

Our research's most important outcome is that we must establish and widespread education campaigns to raise awareness of HPV infection, its association with cervical cancer, and the high protective effect of the vaccinations on the disease as a government policy.

Although Turkey's health care has not yet introduced the HPV vaccine into the official vaccination protocol, we must teach the community that this vaccine was involved in the strongly proposed vaccination algorithm. Our reports provided us that health providers and collective information panels should be included to raise public awareness. Further studies would provide us with satisfactory results of raised HPV vaccination with public knowledge leading to an increased number of cervical cancer cases.

Ethics

Ethics Committee Approval: The Duzce University Faculty of Medicine Ethics Committee approved the study following the Word Medical Association Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects (decision no: 2018/48, date: 05.03.2018).

Informed Consent: Written informed consent was obtained.

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Authorship Contributions

Surgical and Medical Practices: Ö.K., M.A., Concept: Ö.K., F.T., M.M.N.E., Design: Ö.K., F.T., M.M.N.E., Data Collection or Processing: Ö.K., M.A., F.T., Analysis or Interpretation: Ö.K., F.T., N.E., Literature Search: Ö.K., M.A., F.T., M.M.N.E., K.K., Writing: Ö.K., M.A., K.K.

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