RESEARCH ARTICLE

# Knowledge and Attitudes about Human Papillomaviruses and Immunization among Turkish Pediatricians

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## Abstract

**Background: Human papillomavirus (HPV) is one of the most common sexually transmitted infectious agents, and the effectiveness of vaccine delivery programs will depend largely upon whether providers recommend vaccines. The objectives of this study were to examine pediatrician characteristics, knowledge, and attitudes associated with HPV and HPV immunization. Materials and Methods: Attendees of the national pediatric meeting in 2011, were asked to complete a questionnaire that, aside from demographic information, elicited level of agreement with statements regarding HPV, its related diseases, and HPV vaccination. It also documented attitudes and beliefs about HPV vaccination. Results: Of the 480 attendees, 226 (47%) filled in the questionnaire. The level of pediatrician HPV-related knowledge varied. The majority (78%) were aware that HPV infection is the most common sexually transmitted infection, while 51% were unaware that a condom is ineffective protection against HPV infection. Between 60-80% of respondents were aware of the effectiveness of HPV vaccination for women. On the other hand, only 10% were aware of reasons why men should be vaccinated against HPV. The majority (75%) of Turkish pediatricians were likely to recommend HPV vaccination to their daughter, if they had one. Seventy percent of pediatricians agreed that the HPV vaccination should be added to the National Immunization Program (NIP) in Turkey. However, the respondents documented concerns about the cost of the vaccination. Conclusions: Increasing pediatricians' knowledge and awareness of HPV and HPV vaccination may assist with the implementation of an effective NIP.**

**Keywords:** Human papillomaviruses - attitudes - pediatricians - vaccines - immunization - Turkey

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## Introduction

Human papillomaviruses (HPV) are responsible for one of the most common sexually transmitted infections with more than 20 million individuals currently affected in the United States. This equates to a global prevalence ranging from 1.4% to 25.6%, based on several reports. Almost all sexually active women and men are at risk of HPV infection and the associated cancers and diseases, such as genital warts (Ho et al., 1998; Woodman et al., 2001; Munoz et al., 2003; Winer et al., 2003; Clifford et al., 2005). HPV infection is the most common within 2 years of the onset of sexual activity. Of the more than 100 strains of HPV, HPV-16 and HPV-18 are responsible for approximately 70% of cervical cancers, while HPV-6 and HPV-11 are responsible for approximately 90% of genital wart cases (Walboomers et al., 1999; Munoz et al., 2003; Trottier and Franco, 2006).

Nearly all women will have contracted genital HPV infection by the age of 50 years, and approximately 85% of women with cervical cancer live in low-income countries (Clifford et al., 2005). In Turkey, HPV prevalence has been reported between 2% and 20% in several regional studies (Ozcelik et al., 2003; Inal et al., 2007; Dursun et al., 2009) and HPV-16 was the most common genotype observed among Turkish women (Tuncer et al., 2012). According to reports from the Ministry of Health and GLOBOCAN, cervical cancer was the ninth most common cancer among women in Turkey, with an estimated 1,364 cases annually (IARC, 2007; Demir et al., 2012).

HPV vaccination has the potential to greatly reduce the morbidity and mortality associated with genital HPV infections. Several HPV vaccines have been developed, including a bivalent (strains 16 and 18) and a quadrivalent (strains 16, 18, 6, and 11) vaccine (Harper et al., 2004; Villa et al., 2005; Harper et al., 2006). The Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices (ACIP) recommends routine vaccination of girls aged 11-12 years, as well as for those aged 13-26 years who have not been previously vaccinated (Markowitz et al., 2007; Vadaparampil et al., 2011). A quadrivalent vaccine was licensed by the US Food and Drug Administration (FDA) for use in males 9 through 26 years of age in 2009 (American Academy

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of Pediatrics, 2012). The aim is to deliver the vaccine prior to the onset of sexual activity and therefore the first potential for HPV exposure (Mao et al., 2006; Winer et al., 2008). Preventive care physician visits are common for young people, and 11-12-year-old girls, particularly, are twice as likely to visit a pediatrician as any other health provider (Ziv et al., 1999; Zimet et al., 2000; Rand et al., 2007). Pediatric health care providers are experienced in vaccination delivery (Rand et al., 2007) and are able to influence parents' decisions about vaccinations (Ziv et al., 1999; Zimet et al., 2000; Rand et al., 2007). Failing to recommend vaccinations to younger girls represents a missed clinical opportunity for individual and population-level HPV infection prevention.

The Turkish public believes that immunization is the responsibility of pediatricians. Because of this, pediatricians may play an important role in increasing public awareness of the goals of the National Immunization Program (NIP). The NIP in Turkey does not currently include the HPV vaccine. Anecdotal evidence suggests that Turkish pediatricians and family physicians place little importance on the HPV vaccine due to a perceived lack of sexual activity among adolescents and low HPV infection prevalence. Therefore, an important first step in developing an effective HPV immunization program is to understand Turkish pediatricians' knowledge of HPV and attitudes about HPV vaccination.

## Materials and Methods

Pediatricians attending the 2011 PUADER Congress, a national pediatrics meeting in Turkey, were provided with and asked to fill out a questionnaire at the morning meeting, to be collected following the scientific sessions. Respondents were informed of the voluntary nature of the survey. No ethics consent was required, and informed consent was assumed if the respondents completed the questionnaire. Participants were not asked to provide their name or contact details to retain the anonymity and confidentiality of the responses.

The questionnaire was designed for this study and based on information provided in the HPV, HPV-related diseases, and HPV vaccination reports. The questionnaire aimed at capturing the following information from the pediatricians: *i*) demographic characteristics (age, gender, subspecialty, and practice setting); *ii*) knowledge about HPV (incidence, risk factors, prevention, age-specific prevalence, HPV-related diseases, HPV-related cancers, and oncogenic HPV types); *iii*) knowledge about HPV vaccination (protection rate of the HPV vaccine, recommended age for vaccination, vaccination of men, catch-up vaccination, and pre and post-vaccination processes); and *iv*) attitudes towards HPV vaccination in Turkey.

Written instructions for completion were provided at the beginning of the questionnaire. There was a mixture of multiple choice questions and questions with response choices of "true" and "false" or "agree", "disagree" and "not sure". Results were expressed as the percentage of "true" and "false" responses or "agree", "disagree" and "not sure" responses to each question. Respondents were given the opportunity to include comments if they wished to do so. Respondents were given the opportunity to include comments if they wished to do just for the "agree", "disagree" and "not sure" options.

Statistical analyses were performed using SPSS version 15.0 (Chicago, IL, USA). Chi-squared tests were used to compare categorical data, t tests were used to compare normally distributed continuous data, Kruskal-Wallis and Mann-Whitney U tests were used to compare non-normally distributed data. Independent risk factors affecting the knowledge of HPV and HPV vaccine were determined by multivariate linear regression analysis. Statistical significance was considered $p \leq 0.05$.

## Results

*Characteristics of the respondent pediatricians*

Of the 620 pediatricians invited, 480 attended the meeting and 226 of the attendees (47%) responded to the questionnaire. All of the respondents worked in urban areas of Turkey. The characteristics of the study group are summarized in Table 1. There was a wide range of ages (24-64 years) and fewer men than women (male:female=0.9). Pediatric residents and specialists accounted for the majority (81.0%) of respondents, and a similar proportion (80.5%) worked in a university or government hospital.

*Knowledge about HPV*

Responses to several true/false questions regarding HPV and HPV-related diseases are presented in Figure 1. Pediatricians' HPV-related knowledge varied. The majority (78%) were aware that HPV infection is the most common sexually transmitted infection, while 51% were unaware that the use of a condom does not protect against HPV infection. About half (51%) of the respondents identified only cervical cancer as a consequence of HPV infection.

*Knowledge about HPV vaccination*

Figure 2 presents the respondents' knowledge about HPV vaccination. The majority (60-80%) of respondents were knowledgeable about the HPV vaccination for women, while only a small proportion (10%) were aware of the need for vaccination for men.

**Table 1. Demographic Characteristics of the Pediatricians Who Responded to the Questionnaire (n = 226)**

| Characteristics | | n (%) |
|---|---|---|
| Age* (years) | | 34.4±8.7 (24-64) |
| Gender | Male | 108 (48.0) |
| | Female | 118 (52.0) |
| Subspeciality | Pediatric resident | 91 (40.3) |
| | Specialist | 92 (40.7) |
| | Fellowship resident | 30 (13.3) |
| | Attanding physicians | 13 (5.7) |
| Practice setting | University hospital | 127 (56.2) |
| | Government/state hospital | 55 (24.3) |
| | Private hospital/practice | 44 (19.5) |

*Mean±standard error of the mean (range)

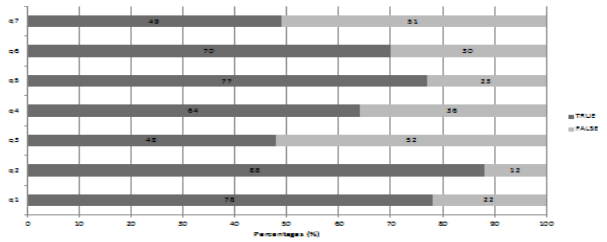

**Figure 1. Pediatricians' Knowledge about HPV.** q1. HPV infection is the most common sexually transmitted infection, q2. The prevalence of HPV may significantly increase with an increase in the number of sexual partners, q3. HPV infection can be prevented by vaccination/HPV infection can be prevented by condom use/HPV infection can be prevented by hygiene measures, q4. The highest rates of HPV infection in women are seen in early adulthood (<25 years of age), q5. What are the common HPV-related diseases?, q6. What are the oncogenic HPV types?, q7. HPV infection has been implicated in some squamous cell cancers of the head and neck, but at lower rates than in genital cancers

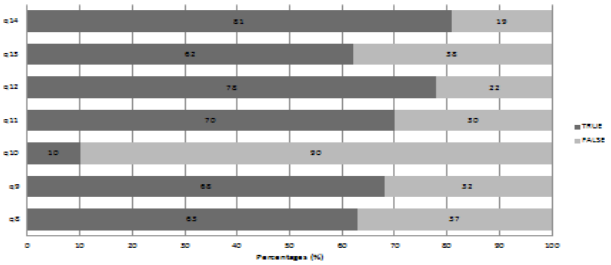

**Figure 2. Pediatricians' Knowledge about HPV Vaccination.** q8. HPV vaccination could prevent approximately 70% of cervical cancers. q9. HPV vaccination is currently recommended for 11- to 12-year-old girls before the first sexual intercourse, q10. HPV vaccination is also currently recommended for men to prevent penile warts. q11. Screening for HPV DNA and serological tests are not needed before the vaccination, q12. HPV vaccination is currently recommended as a "catch-up" vaccination for unimmunized 13- to 26-year-old female patients, q13. Young women may be vaccinated regardless of the results of cervical screening and persistent infections possibly acquired before vaccination, q14. After the vaccination of young women, cervical screening will/must continue to play an important role in the prevention of cervical cancer

Although no difference between response rates of the other questions, men and those aged 40 years and older were significantly more likely to answer questions 3 (p=0.01 and p=0.00, respectively) and 13 (p=0.03 and p=0.02, respectively) correctly. Questions 3 and 13 were also answered correctly significantly more often by respondents who worked in government hospitals and private settings than by respondents who worked in university hospitals (p=0.00 and p=0.02, respectively). Variables independently associated with question 3 (knowledge about HPV infection) and question 13 (HPV vaccination) included age (older than 40 years of age) were (Beta=1.74; 95% CI: 0.96-3.18; p= 0.000), and (Beta=2.48; 95% CI: 1.06-5.79; p=0.036), respectively.

*Attitudes of Turkish pediatricians about HPV vaccination*

Respondents indicated that they believed the following vaccinations should be included in the Turkish NIP (Figure 3): varicella, rotavirus, hepatitis A, influenza, and HPV.

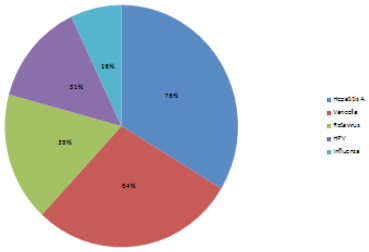

**Figure 3. Responses Regarding Pediatricians' Preferences for Provision of the Vaccine Under the Turkish National Immunization Program (NIP)**

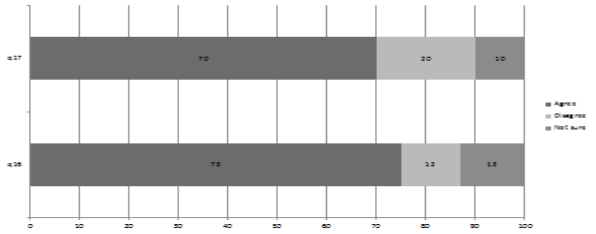

**Figure 4. Attitudes of Pediatricians towards HPV Vaccination.** q16 Do you recommend the HPV vaccine to your daughter, if you have a daughter?, q17 Do you want the HPV vaccine to be included in the NIP?

The majority (70%) of the respondents agreed that the HPV vaccination should be included in the NIP of Turkey (Figure 4). Analysis of the written answers for those who disagreed indicated that the expense of the vaccine was reported significantly more often than other reasons, such as the potential adverse effects (p=0.02). The majority (75%) of the respondents indicated that they do or would recommend the HPV vaccine for their daughters, if they had one (Figure 4). Older respondents (aged ≥40 years) were significantly more likely than younger respondents (aged <40 years) to recommend the HPV vaccine to their daughters (p=0.01).

## Discussion

The prevalence of HPV infection and, consequently cervical cancer, is increasing in Turkey. Vaccination programs are effective in preventing the disease (Dursun et al., 2009; Demir et al., 2012). However, with the delay between initial HPV infection and the evidence of its consequences, it can be difficult to convince health professionals of the effectiveness of the vaccine. This is particularly true when they have limited knowledge of the disease and its vaccine.

The current study aimed at documenting Turkish pediatricians' knowledge of HPV-related diseases and HPV vaccination. Despite their documented lack of understanding about methods to prevent HPV infection, the extent of cancers that can occur due to HPV and the need to vaccinate men, the majority of the pediatricians surveyed agreed that the HPV vaccine should be included in the Turkish NIP and that it was important for their daughters to be vaccinated. Most pediatricians reported a high likelihood of recommending HPV vaccines to their patients in several reports (Kahn et al., 2005; Daley et al., 2006; Kahn et al., 2007) that may be assumed as consistent with the findings of our study. However, their intentions

varied according to patient age and gender. Given the generally positive attitudes towards the HPV vaccination, increasing pediatricians' awareness and knowledge about HPV and its related diseases may be an effective strategy in increasing advocacy for HPV vaccination in Turkey.

However, a number of challenges remain. Health practitioners believe that the low incidence of cervical cancer in Turkey can be attributed to reduced exposure to the HPV virus and few sexual partners resulting from religious beliefs and social and cultural rules (Dursun et al., 2009). However, HPV infection is frequently reported in Turkish women with normal cervical cytology (Demir et al., 2012). Although obstetricians and gynecologists frequently care for women who have developed the sequelae of HPV infection, pediatricians may not have similar levels of experience with HPV-related diseases. This may explain the lack of knowledge of pediatricians relating to HPV and the related diseases documented using the questionnaire (questions 1-7).

The older pediatricians had greater knowledge about HPV and HPV vaccination in the current study than did the other respondents. This possibly may be attributed that the higher experience of them with HPV-related diseases than the others. Gaining further understanding about why this is the case may assist with education of other pediatricians and therefore assist with implementing successful immunization programs. Pediatric attention on HPV and HPV vaccines along with renewed interest in related medical research will assist with education and advocacy of this area (Daley et al., 2006; Ishibashi et al., 2008).

Among factors associated to acceptability of the vaccine for parents were knowledge and concern about disease, desire to protect their children, and physician recommendation. Reported barriers to vaccination were perception that their children were at low risk for infection, lack of knowledge, cost, low perceived vaccine safety and efficacy and perceived promotion of adolescent sexual activities (Olshen et al., 2005; Dempsey et al., 2006; Marlow et al., 2007). Willingness of parents, especially mothers, to have their children vaccinated against a sexually transmitted infection (STI) disease should be carefully considered as well, especially in Muslim countries such as Turkey, for a successful HPV immunization program. Because parents may feel uncomfortable to talk about the issues dealing with sex and STIs are seen as taboo, and often are not discussed openly, like other Islamic communities.

The majority of respondents (75%) in our study would recommend the HPV vaccine to their daughters as consistently to some studies from Turkey. Ilter et al. (2010) reported that vaccination acceptance rates of mothers of daughters in a study were as high as 89%. Turkish participants disagree that vaccination may encourage girls to have unsafe sex. This was also an important result for a Muslim society. There has always been a perception that religion may be an issue when implementing a vaccine for a STI, particularly in a predominantly Islamic country. Woo et al. (2012) reported that despite being a religious society, the acceptability of HPV vaccination was still high in Malaysia. Wong (2009) reported that Muslim Malay physicians showed a heightened sensitivity to recommendation of an STI vaccine as consistently with our findings. A recent study in Indonesia conducted by Jaspers et al. (2011) among parents found high parental HPV vaccine acceptance. Despite the high acceptability of HPV vaccination in countries that mentioned above, knowledge about HPV infection and vaccination is low in Muslim countries including United Arab Emirates and Syria (Alsaad et al., 2012; Ortashi et al., 2013).

In terms of relative importance, only a small percentage of the respondents identified the HPV vaccine as the highest priority to be added to the NIP. The hepatitis-A vaccine was identified as the highest priority for addition to the NIP, followed by the varicella vaccine. While the hepatitis A and varicella vaccines were not available in the NIP at the time of the questionnaire, they were included as routine vaccinations in the 2012 schedule. Therefore, the findings of this study may be representative of the general perspectives of the Turkish physicians.

The cost of HPV vaccination was the most commonly reported perceived obstacle in the present study to its adoption in the NIP. Pediatricians have expressed concern about the cost of vaccines in some previous reports (Kahn et al., 2005; Riedesel et al., 2005; Daley et al., 2006). Therefore, addressing these financial concerns will be a challenging but important aspect of HPV vaccination implementation.

This study had several limitations. First, this study includes a relatively small sample size with a low response rate and potential over-representation of clinicians from university and government hospitals. Limited experience with HPV-related diseases and lack of available time to complete the questionnaire while at a conference may explain the low response rate. This potential sampling bias may limit the generalizability of our results. Despite these limitations, our work provides one of the first assessments of Turkish pediatricians' attitudes and beliefs about HPV vaccination. Second, the questionnaire documented the pediatricians' willingness to recommend the HPV vaccine for their female family members rather than to their patients. Pediatricians' willingness to recommend immunizations to their patients has been reported in a number of previous studies (Daley et al., 2006; Kahn et al., 2007). We believed that a willingness to vaccinate family members would generalize to patients as well.

In conclusion, in a country like Turkey, where the population is relatively young and HPV infection prevalence is increasing, increasing health professionals' awareness and knowledge about HPV infection, HPV-related diseases, and HPV vaccination may assist with implementing an effective NIP.

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