

## RESEARCH ARTICLE

## Awareness of Turkish Female Adolescents and Young Women about HPV and their Attitudes Towards HPV Vaccination

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### Abstract

**Background:** The aim of the study was to assess the knowledge about HPV and HPV vaccines and attitudes towards vaccination among the females aged 9-24 years in Turkey. **Materials and Methods:** Self-administered questionnaires were filled out individually by the participants covering demographic information, knowledge about HPV infection and HPV vaccines, attitudes towards vaccination, and the perceptions of them about their parental attitudes about vaccination. **Results:** Of the 408 subjects participating in the study, 41.6% (n=170) had heard of HPV. Thirty-three percent (n=136) knew the causal relationship between HPV and cervical cancer. Only 27.9% (n=114) of them knew that HPV vaccines can prevent cervical cancer. Eleven percent (n=46) of the females participating in the study were willing to be vaccinated, and only 1.4% (n=6) were already vaccinated at the current time. The main reason listed among the participants who were not willing to be vaccinated was lack of information. **Conclusions:** Awareness and knowledge of Turkish female adolescents and young women about HPV, relation with cervical cancer and prevention of cervical cancer by Pap smear and vaccine are still limited. If the most important barrier to vaccination, which is reported as lack of information, were to be addressed, it would greatly impact the decision-making and vaccine acceptance.

**Keywords:** HPV - vaccine - knowledge - acceptance - adolescents - Turkey

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### Introduction

Genital human papillomavirus (HPV) is the most common sexually transmitted infection in the United States. About 20 million people, mostly in their late teens and early 20s, are infected with HPV (<http://www.cdc.gov/vaccines/who/teens/vaccines/hpv.html>). The prevalence of genital HPV infection in the world is around 440 million ([http://www.who.int/vaccine\\_research/diseases/viral\\_cancers/en/index3.html](http://www.who.int/vaccine_research/diseases/viral_cancers/en/index3.html)), and the lifetime risk of acquiring a genital HPV infection is estimated to be at least 80% for sexually active women (Bekkers et al., 2004).

Although most infections with HPV are asymptomatic, persistent infection with certain oncogenic types (mainly 16 and 18) can cause cervical cancer in women. Virtually almost all cervical cancer cases are linked to genital infection with HPV (Walboomers et al., 1999). Cervical cancer is the second most common cancer in women worldwide, with about 500,000 new cases and 250,000 deaths each year. Almost 80% of cases occur in low-income countries (<http://www.who.int/reproductivehealth/topics/cancers/en/>). In Turkey, the incidence rate of cervical cancer was estimated as 4.3 per 100,000 in 2007 (<http://ketem.org/istatistik.php>). However, the incidence

of HPV infection in Turkey is not well studied; though hospital based studies report the prevalence of HPV infection ranging from 2.1-16.5% among low-risk Turkish women (Inal et al., 2007; Eren et al., 2010).

In order to prevent HPV infections and reduce the risk of pre-invasive and invasive neoplasias of the cervix, the United States Food and Drug Administration (FDA) approved a quadrivalent vaccine against HPV types 6, 11, 16 and 18 in June, 2006 (FDA, 2006), and a bivalent vaccine against types 16 and 18 was approved by the European Commission in September, 2007. Both products seem to be safe, well tolerated and effective (Lenselink et al., 2008a). In Turkey, the vaccines have been in use since 2007, however, they are not reimbursed.

For an effective prophylaxis, the vaccine has to be delivered before exposure to the virus, and preferably, at the prepubertal stage of a woman's life because the antibody responses are higher compared to those of after puberty (Ilter et al., 2010). Thus, the primary target group of HPV vaccination is the adolescent girls and young women. By HPV vaccination, it has been estimated that the risk of cervical cancer for 12-year-old girls may be reduced by 61.8% (Taira et al., 2004).

Awareness and knowledge of adolescents and young

women about HPV and its related conditions are integral to the success of implementation of preventive measures against HPV and cervical cancer. Within this scope, the aims of the study are: *i*) to assess the basic knowledge of Turkish adolescent and young females about HPV, HPV related conditions and HPV vaccines; *ii*) to identify their attitudes towards vaccination; and *iii*) to establish perceptions about the attitudes of their parents towards vaccination of their daughters.

## Materials and Methods

Zekai Tahir Burak Women's Health Education and Research Hospital is a tertiary care hospital located in Ankara, the capital city of Turkey. The Adolescent Unit of the hospital is tertiary level of medical attendance, mainly in adolescence gynecology. A questionnaire survey was conducted regarding HPV infections and HPV vaccines in the Adolescent Unit. The study was approved by the Institutional Review Board of the hospital. Every adolescent and young woman applying to the centre was asked to fill out a questionnaire while waiting for an examination or consultancy in the attendance room. Four hundred and eight females aged between 9 and 24 years agreed to participate in the survey.

Self-administered questionnaires were filled out individually by the participants under the supervision of one of the researchers. A literature search of published surveys about HPV and HPV vaccination was conducted, and appropriate questions were selected, modified and adapted to Turkish population. The questionnaire consisted of 4 parts with a total of 16 items. The first part involved questions about sociodemographic status. The questions included age, marital status, education and occupation. The second part assessed the information about HPV, HPV related conditions, and the perceptions about the prevention of the disease. The third part assessed the awareness and knowledge about HPV vaccines. The last part investigated into whether (or not) they were HPV vaccinated, into the assessment of the attitudes of the adolescents and young women towards HPV vaccination and into their perceptions about parental attitudes. Each part consisted of multiple-choice, true/false, and multiple response questions. Responses to all of the attitudinal variables were assessed by asking the opinions of the females themselves and of their parents about vaccination.

The participants were divided into two groups based on the age, the former defined as adolescents ( $\leq 18$  years of age) and the latter as young women ( $>18$  years)

### Statistical analysis

Statistical analysis was done by SPSS for Windows 18 software. Chi-square test was used for univariate analysis. Multiple logistic regression was used to determine the risk factor of HPV vaccination. The  $p < 0.05$  was accepted as statistically significant.

## Results

The characteristics of the participants are demonstrated in Table 1. The mean age of the 408 subjects was

18.5 $\pm$ 2.7 years (range 9-24 years), 2.5% (n=10) of them were married and sexually active. With regard to education, 85.7% (n=350) of them were high school and university students. Fifteen percent (n=61) of the participants stated that they had been working.

### Knowledge about HPV and HPV related conditions, sources of information, and the perceptions about the prevention of the disease

Table 2 presents the knowledge of HPV and HPV related conditions, the diagnosis with Pap smear, the sources of information about HPV and the perceptions about the prevention of the disease stratified by age. Of the 408 females participating in the study, 41.6% (n=170) had heard of HPV, and 33.3% (n=136) of those knew that HPV may cause cervical cancer, and 13.2% (n=54) knew HPV can be detected with Pap smear. The young women ( $>18$  years) were significantly more likely to have heard of HPV than the adolescents ( $\leq 18$  years) (35.6% vs 47.6%,  $p=0.015$ ). Young women were more aware that HPV might cause genital lesions such as warts and cervical cancer (9.4% vs 19%,  $p < 0.001$  and 28.2% vs 38.5%,  $p=0.095$ ), and that it cannot be cured with antibiotics (8.4% vs 16%,  $p=0.019$ ). Most of the adolescents who knew about HPV had heard about it from health professionals, schools and family members, while young women reported that they had learned about HPV from friends, the internet and the media ( $p=0.021$ ). The most frequently listed method of prevention among young women was the use of condoms (24.8%); however, hygiene seemed to be important in the prevention of HPV among the adolescents (26.7%,  $p=0.002$ ). Vaccination was mentioned by less than 15% in both groups, and screening was regarded as the least popular choice in both groups (Less than 2%).

### Knowledge about HPV vaccine

Table 2 stratifies the knowledge of HPV vaccine by age. Only 21% (n=86) of both groups seemed to know that HPV vaccine is recommended for females aged 9-26 years. The young women are significantly more likely to know that females receiving the vaccine still need to have routine gynecological examinations and Pap smears (17.8% vs 30.1%,  $p=0.004$ ), and use condoms (9.4% vs 26.7%,  $p < 0.001$ ).

### HPV vaccination status, vaccination attitudes of the adolescents and their perceptions about parental attitudes towards vaccination

Table 2 demonstrates the vaccination status, vaccination attitudes of the participants and the perceptions about the

**Table 1. Characteristics of the Participants**

Characteristic	n (%)
Age (years, mean $\pm$ SD)	18.5 $\pm$ 2.7
Marital status	398 (97.5)
Single	
Married	10 (2.5)
Education	
Primary school	8 (2.0)
Secondary school	50 (12.3)
High school	185 (45.3)
University	165 (40.4)
Occupation	
Working	61 (15.0)
Not working	347 (85.0)

**Table 2. Results of the Questionnaire of HPV and HPV Vaccine**

		Total (n=408)	≤18 years (n=202)	>18 years (n=206)	p
Have heard of HPV		170 (41.6)	72 (35.6)	98 (47.6)	0.015
Knew that HPV:	Can cause genital warts	58 (14.2)	19 (9.4)	39 (19.0)	<0.001
	Can cause cervical cancer	136 (33.3)	57 (28.2)	79 (38.5)	0.095
	Can be detected with pap smear	54 (13.2)	22 (10.9)	32 (20.5)	0.207
	Cannot be cured with antibiotics	50 (12.2)	17 (8.4)	33 (16.0)	0.019
Sources of information:	Health professionals	106 (25.9)	58 (28.7)	48 (23.3)	0.021
	Media (radio, television, newspapers, magazines)	58 (14.2)	18 (8.9)	40 (19.4)	
	Friends	25 (6.1)	9 (4.5)	16 (7.8)	
	Internet	38 (9.3)	18 (8.9)	20 (9.7)	
	School/teacher	34 (8.3)	20 (9.9)	14 (6.8)	
	Family	11 (2.6)	8 (4.0)	3 (1.5)	
Perceptions of the prevention:	Using condoms	69 (16.9)	18 (8.9)	51 (24.8)	0.002
	Monogamy	56 (13.7)	18 (8.9)	19 (9.2)	
	Screening	8 (1.9)	4 (2.0)	4 (1.9)	
	Hygiene	92 (22.5)	54 (26.7)	38 (18.4)	
	Medications	29 (7.1)	18 (8.9)	11 (5.3)	
	Vaccination	53 (12.9)	27 (13.4)	26 (12.6)	
Knew that:	HPV vaccine is recommended for females aged 9-26	86 (21)	39 (19.3)	47 (22.8)	0.385
	HPV vaccine can prevent cervical cancer	114 (27.9)	48 (23.8)	66 (32)	0.062
	Females receiving vaccination still need gynecological exams and Pap smears	98 (24)	36 (17.8)	62 (30.1)	0.04
	Females receiving vaccination still have to use condoms	74 (18.1)	19 (9.4)	55 (26.7)	<0.001
	HPV vaccine is not covered by the health insurance	29 (7.1)	11 (5.4)	18 (8.7)	0.196
Vaccinated		6 (1.4)	4 (2.0)	2 (1.0)	0.446
HPV vaccination attitudes					0.049
Willing to be vaccinated		46 (11.2)	13 (6.4)	33 (16.0)	
Not willing to be vaccinated because of:	doubts about efficacy	4 (0.9)	3 (1.5)	1 (0.5)	
	doubts about safety	10 (2.4)	6 (3.0)	4 (1.9)	
	cost	1 (0.2)	1 (0.5)	0 (0.0)	
	their parents would not allow them to be vaccinated	7 (1.7)	4 (2.0)	3 (1.5)	
	lack of information	259 (63.4)	133 (65.8)	126 (61.2)	
	not married yet	81 (19.8)	42 (20.8)	39 (18.9)	

\*Numbers in parenthesis are percentages

attitudes of their parents towards vaccination. Eleven percent (n=46) of both groups participating in the study were willing to be vaccinated, and only 1.4% (n=6) were already vaccinated at the current time. The main reason listed among the females in both age groups who were not willing to be vaccinated was lack of information (65.8% and 61.2%). The second most common reason reported was that they did not want to be vaccinated since they were not married yet (19.8%, n=81). Less than 2% (n=7) of the females in both groups reported that they were unwilling to be vaccinated, because they thought that their parents would not allow them to do so. Only 3.4% (n=14) of the females had doubts about safety and efficacy related to the vaccine.

#### Intention to receive HPV vaccine

Of all the 408 participants, 46 (11.2%) were willing to be vaccinated. Educational and occupational status, and information of HPV from health professionals were not significantly associated with the intention of receiving HPV vaccine; however, higher levels of interest in HPV vaccination were detected in the young women (OR=2.55, 95%CI, 1.29-5.06), and in those who had heard of cervical cancer (OR=2.48, 95%CI, 1.32-4.66).

## Discussion

In the United States, prevalence rates of many sexually acquired infections are highest among adolescents, and many persons acquire HPV infection during their adolescent years (<http://www.cdc.gov/std/treatment/2010/>

<http://www.cdc.gov/std/treatment/2010/specialpops.htm>). Factors which make the adolescents open to these risks include having multiple sexual partners concurrently or sequential sexual partnerships of limited duration, failing to use barrier protection consistently and correctly, having increased biological susceptibility to infection, and experiencing multiple obstacles to accessing health care (<http://www.cdc.gov/std/treatment/2010/specialpops.htm>).

HPV vaccines are prepared from empty protein shells called virus-like particles produced by recombinant technology (Cutts et al., 2007). They do not contain any live biological product or DNA, so they are non-infectious. Antibody levels achieved after vaccination are inversely related to age. Thus, the most effective target population for HPV vaccination is young adolescent girls who have not been exposed to vaccine related HPV types. It has been claimed that both HPV vaccines are at least 95% effective in preventing HPV 16 or 18 persistent infection and at least 93% effective in preventing vaccine type-specific cervical lesions when given to girls prior to sexual activity, or to women without prior infection with these HPV types ([http://www.rho.org/files/CCA\\_HP\\_vaccination\\_strategies\\_pdf](http://www.rho.org/files/CCA_HP_vaccination_strategies_pdf)).

In the present study, the awareness of HPV among female subjects surveyed was not so low, (41.6%); 33% of the subjects knew about the causal relation between HPV and cervical cancer. In the study of Durusoy et al. (2010) in 2010, which assessed HPV vaccine awareness and willingness of the first year students of university in Western Turkey, 75.9% of them had never heard of HPV. Even the most obvious fact that HPV causes cervical

cancer was known only by one third of the respondents. Total knowledge score was remarkably poor (1.8 over 12), and 60% of the respondents had zero as their score. The study included both genders, however, they found no difference in mean knowledge scores between males and females (Durusoy et al., 2010). Lenselink et al. (2008) in 2008 found that only 17.7% of the 600 Dutch young adults aged 18-25 years had heard of HPV and even fewer were aware of its causal relationship with cervical carcinoma (Lenselink et al., 2008b). In the study of Di Giuseppe et al. (2008) in 2008 from Italy, which included 1348 females aged 14-24 years, they found that women's knowledge about HPV infection and cervical cancer was remarkably poor, as only 23.3% had ever heard of them (Di Giuseppe et al., 2008). On the other hand, Caskey et al. (2009), in their study of a national survey including 1011 females aged 13-26 years from US in 2009, found that 88% of the participants reported having heard of HPV prior to the survey (Caskey et al., 2009). In a more recent study from Hungary including 1769 adolescents aged between 12 and 19 years, 31.2% of female primary school students and 49.1% of secondary school students were aware of HPV. Among the ones who had heard of HPV, 43.3% of the female primary school students and 54.3% of the female secondary school students also knew that HPV may induce cervical cancer (Marek et al., 2011). Moreover, recently a Belgian study examined awareness of the females about the HPV vaccine at the moment of its introduction and one year later, and found that the initial 27% unawareness (among women less than 25 years of age) dropped to 6% during that time (Donders et al., 2009). It seems that the knowledge of adolescents and young women about HPV and its relation with cervical cancer have risen over time throughout the world as well as in Turkey.

In our study population, knowledge about detection of HPV and related conditions with a Pap smear was extremely low (13.2%). Moreover, screening as a way of prevention of HPV was mentioned by about 2% of the participants. The most frequently listed method of prevention was the use of condoms among the females over 18 years of age, whereas hygiene seemed to be more important among the adolescents less than 18 years of age as a way of prevention. This shows the inadequacy of the knowledge of our subjects about the secondary prevention of cervical cancer, which is routine gynecological examination and Pap smear. ACOG recommends that cervical cancer screening begin at age of 21 years, a recommendation based on the low incidence of cervical cancer and limited utility of screening for younger adolescents. However, the American Cancer Society (ACS) recommends that women start cervical screening with Pap tests 3 years after initiating sexual activity, but by no later than 21 years of age (<http://www.cdc.gov/std/treatment/2010/specialpops.htm>). Although the new HPV vaccines are expected to significantly reduce the incidence of cervical cancer, they are not replacement for routine cervical screening. Rather, a comprehensive approach which uses vaccination in partnership with screening will maximize effectiveness ([http://www.rho.org/files/CCA\\_HPV\\_vaccination\\_strategies\\_pdf](http://www.rho.org/files/CCA_HPV_vaccination_strategies_pdf)).

As far as the source of information about HPV and

related conditions is concerned, we observed age related differences among participants. Most of the adolescents less than 18 years of age who knew about HPV had heard about it from health professionals, schools and family members. As expected, those over 18 years of age mentioned that they had learned about HPV from friends, the internet and the media. The importance of mass media as a source of information about HPV and vaccine is revealed by other studies as well. (Di Giuseppe et al., 2008; Donders et al., 2009; 2010).

Another finding of the study is that only a minority of the participating females (12.9%) knew that vaccination can prevent HPV, and thus it seems that most are still unaware of such a vaccine despite a general knowledge of HPV. This may be considered as one of the reasons why the vaccination rate was very low among the participants. This finding is even lower than those observed in other surveys. In the study of Di Giuseppe et al. (2008), it was reported that 42.1% of the adolescents knew that vaccine was a preventive measure, but only 15.3% knew that vaccine was available in Italy (Di Giuseppe et al., 2008). Marek et al. (2011) found that approximately one fifth of all students (21.3%) considered vaccine as a way of prophylaxis, a lot more females than males (Marek et al., 2011).

Although the awareness of HPV was not so low in the survey population, vaccination rate was very low with only 1.4%. A striking finding of the survey was that the intention to receive the vaccine was also low with 11.2%. Lack of information about the vaccine was reported as the main barrier to vaccination. Similarly, in a recent study from Turkey, the most common reason reported among the adolescents for not willing to be vaccinated or for being indecisive (92.9%) was that they did not have sufficient knowledge about the vaccine although the study was conducted in a nursing school (Kılıç et al., 2012). A misperception that not being married currently was also an important barrier reported by one fifth of the adolescents. Consistent with our study, in the study of Caskey et al. (2009), almost 30% of the unvaccinated respondents also reported avoiding the vaccine because of not being sexually active (Caskey et al., 2009). Attitudes towards vaccination vary considerably between studies from different countries. A previous study from Turkey in 2010 revealed a similar result as 10.9% of the participants intended to receive vaccine (Durusoy et al., 2009). On the other hand, in the study of Kılıç et al. (2012) from Turkey, 43.5% of the adolescent females wished to be vaccinated against HPV, however, this study was conducted among nursing students who may be more informed about HPV and related issues (Kılıç et al., 2012). In the literature, acceptance rates of vaccine is reported as 49-81.7% in western countries (Di Giuseppe et al., 2008; Mortensen, 2010; Marek et al., 2011; Blumenthal et al., 2012), whereas 48-63% is reported for the east (Hsu et al., 2009; Wong and Sam, 2010). Acceptance of vaccination among adolescents has been shown to go mostly in accordance with their parents' attitude towards it (Rosenthal et al., 1995). In a recent study from Malaysia which included mothers, it was found that the acceptance of HPV vaccine to be administered for daughter was 87.1% (Ezat et al., 2013). In our study, the perceptions of the adolescents about

their parental attitudes towards vaccination were broadly positive, only 1.7% of them stated that their parent would not allow them to be vaccinated. Multivariate analysis showed that the intention to receive vaccination was related to older age and being informed about cervical cancer.

The study has inevitably some limitations. First, it has cross-sectional design which precludes determination of causal relationships between different factors and outcomes. Second, no data was collected regarding sexual experiences and STD histories of the subjects because of cultural sensitivity about sexuality. Third, data was obtained only through self-reported questionnaires, which may have the possibility of incorrect responses.

In conclusion, the study showed that awareness and knowledge of adolescents' about HPV, its relation with cervical cancer and prevention of cervical cancer by Pap smear and vaccine are still limited. Although preventive HPV vaccines do not eliminate the risk of cervical cancer, they have the potential to substantially reduce HPV associated morbidity and mortality. Effective immunization strategy will be integral to the success of implementation of the baseline disease knowledge and prevention measures, because most adolescents will need to be informed about vaccines and diseases before they consider vaccination. If the most important barrier to vaccination, which is reported as lack of information, was to be addressed, it would greatly impact the decision-making and vaccine acceptance of adolescents and young women.

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