

## RESEARCH ARTICLE

# Acceptance of Human Papillomavirus Vaccine by Adolescent Girls and Their Parents in Turkey

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### Abstract

**Purpose:** The aim of this study was to identify the opinions of Turkish adolescent girls and their parents about HPV vaccination and the consistency. **Methods:** This descriptive study covered 301 girls and their parents. Questionnaires were developed by the researchers based on findings within the literature and applied for data collection. **Results:** The mean age was 19.4 for girls, 44.2 for mothers and 47.9 for fathers. It was found that 43.5 percent of girls and 31.9 percent of mothers wish to be vaccinated against HPV. Also, 45.5 percent of mothers and 44.9 percent of fathers wish for their daughters to be vaccinated against HPV. A moderate consistency was found between mothers and fathers; a low consistency was found between fathers and girls, and between mothers and girls. **Conclusions:** The study indicates that an appropriate background has been partially provided about the acceptability of the vaccine between parents and their daughters in Turkey. However, the vast majority of adolescent girls and parents are indecisive or reluctant about HPV vaccination. This study also showed that the decisions of adolescents about vaccination may be affected by the opinions of the parents.

**Keywords:** Adolescent girls - consistency - human papilloma virus - parents - Turkey

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### Introduction

The human papilloma virus (HPV) is a frequently seen sexually transmitted infection worldwide. Approximately half of the sexually active men and women are estimated to have HPV infection at one time during their lifetime (Nandwani., 2010; Romo et al., 2011). HPV leads to various health disorders depending on its type. These disorders include genital warts, cervical, vaginal and vulvar cancers in women, and genital warts, anal and penile cancers in men (Di Giuseppe et al., 2008; Watts et al., 2009; Trim et al., 2012).

Recently, the most important issue in reducing the mortality and morbidity of HPV infection and related diseases is primary protection. Primary protection against HPV includes elimination of the sexual risk factors and prophylactic vaccination (Nandwani, 2010). Two types of HPV vaccine are available: quadrivalent and bivalent. Quadrivalent vaccines are reported to protect against both the low and the high risk HPV types (HPV 6,11,16 and 18). Bivalent vaccines are reported to protect against the high risk HPV types only (HPV 16,18). Quadrivalent HPV vaccines were first approved by the American Food and Drug Administration (FDA) in 2006 and it was recommended to vaccinate girls aged 9-26 years and young women. In 2009, the use of quadrivalent vaccines in males in the same age group was approved to prevent genital warts (Rambout et al., 2007; Nandwani, 2010). Today, the clinical use of HPV vaccines has been approved in more than 65 countries worldwide and the vaccine has

been put on sale (Durusoy et al., 2010).

Being accepted by the target population is essential for a vaccine to reach it (Breitkopf et al., 2009). The target population for the HPV vaccine is adolescent girls and children. In many countries, the decision for vaccination is reported to be made by parents (Breitkopf et al., 2009; Dempsey et al., 2009). Adolescents and individuals in older age groups are reported to expect support from their parents for guidance in their decisions about vaccination (Fazekas., 2008; Breitkopf et al., 2009). Furthermore, most mothers of adolescent girls (99%) have been reported to be willing to make the decision for vaccination with their daughters (DiAngi et al., 2011). When considered from this point of view, the opinions of both parents and adolescents are observed to be evaluated together for acceptability of HPV vaccines. In previous studies, factors affecting the decisions of parents and adolescents about HPV vaccination were determined as the price of the vaccines, worries about the low effectiveness and side effects, insufficient information about HPV infection and vaccines, and worries that it may increase risky sexual behaviors (Breitkopf et al., 2009; Madhivanan et al., 2009; Watts et al., 2009; Trim et al., 2012). As HPV is a sexually transmitted disease, the opinions about having their daughters vaccinated against HPV may be affected by socio-cultural factors (DiAngi et al., 2011). While most parents have been reported to support vaccination against HPV in some studies (Di Giuseppe et al., 2008; Coleman et al., 2011). The rates of willingness to have their daughters vaccinated against HPV have been reported to be lower

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(Breitkopf et al., 2009; Waller et al., 2006; Kahn et al., 2009). In addition, it has been reported that there could be differences between mothers and fathers about having their daughters vaccinated against HPV (Breitkopf et al., 2009). In a limited number of studies conducted in Turkey, more than half of the parents stated that they wished to have their daughters vaccinated against HPV (Dursun et al., 2009; Onan et al., 2009) approximately 11% of adolescent girls stated that they wished to be vaccinated against HPV (Durusoy et al., 2010). Nevertheless, no studies from Turkey and other countries could be encountered evaluating the opinions of the mother, father and the adolescent girl in the same family. This descriptive study was designed to identify the opinions of Turkish adolescent girls and their parents about HPV vaccination in order to answer the following questions: 1. What is the percentage of Turkish adolescent girls who would like to get vaccinated against HPV? 2. What is the percentage of Turkish mothers who would like their daughters to get vaccinated against HPV and get vaccinated against HPV themselves? 3. What is the percentage of Turkish fathers who would like their daughters to get vaccinated against HPV? 4. What are the factors affecting the opinions of adolescent girls about HPV vaccination? 5. Are the opinions of Turkish mothers, fathers and their adolescent girls about HPV vaccination consistent?

## Materials and Methods

### Participants

The study was conducted in a nursing school in Ankara, Turkey. The students of this school come from families with different economic and cultural status from different parts of Turkey. From this point of view, students included in the study are considered to be a heterogeneous group significantly reflecting the characteristics of the adolescent population in Turkey.

The universe of this descriptive study was derived from a possible sample of 405 girls who attended this school during the 2011-2012 school year and their parents. Nursing students whose parents were alive were enrolled in this study. A total of 104 students and parents were excluded from the study because: they did not agree to participate (82), the parents were divorced (13), the parents were separated (3), or one of the parents had died (6). Therefore 301 participants (n=301) derived from a possible sample of 405 girls and their parents.

### Measures

A 'questionnaire form' developed by the researchers based on findings within the literature was used for data collection. The questionnaire form was prepared separately for the mother, father and the girl. The form comprised 13 questions. Demographic items assessed age, education, employment, and city of residence. The opinions about vaccination against HPV and the reasons were determined by asking parents separately: Would you like your daughter to get vaccinated against HPV? If yes, they were asked to mark the reasons why they would like their daughter to get vaccinated? If no, they were asked to mark the reasons why they do not would

like their daughter to get vaccinated? The opinions about vaccination themselves against HPV and the reasons were determined by asking mothers and girls separately: Would you like to get vaccinated against HPV yourself? If yes, they were asked to mark the reasons why they would like to get vaccinated? If no, they were asked to mark the reasons why they do not would like to get vaccinated? The factors that were considered to affect their opinions, history of genital warts and family history of cervical cancer, and whether or not they had heard about HPV vaccine before were inquired about via the questionnaire.

The questionnaires's content validity was investigated by expert elucidation of general appropriateness and applicability before the study was conducted. A pilot study was carried out with 10 students and parents in order to evaluate the feasibility and comprehensibility. No changes were made in the questionnaire form following the pilot study.

### Procedures

The study began after approval from the ethics board of the author(s) institution. The data of adolescent girls were collected by the researchers and the data of parents were collected by the daughters.

This research was conducted during a period in which all students would go home for holiday. All the students were informed about the aim and the method of the study by the researchers. Questionnaire forms were given to all students who had agreed to participate and they were asked to fill out the forms by themselves. The students were trained as pollsters for collecting data from their parents after the data of students had been collected. The students were informed about how they would invite their parents for participation and how they would fill out the forms if the parents agreed to participate. Each student was given the questionnaire form to be filled out by the parents.

### Statistical Analyses

All the data were analyzed using the Statistical Package for Social Sciences (SPSS), Version 15.0 for Windows. Numbers and percentages were used to express the distribution of data. Logistic regression was used for statistical comparison of the data. The kappa correlation test was used to evaluate the consistency between the opinions of parents and adolescents about the vaccine. Kappa is divided into six categories: < 0 (no consistency), 0.0-0.20 (very low consistency), 0.21-0.40 (low consistency), 0.41-0.60 (moderate consistency), 0.61-0.80 (full consistency) and 0.81-1.00 (almost perfect consistency) (Landis et al., 1977). For the statistical tests, p-values of less than 0.05 were considered to be statistically significant.

## Results

Some socio-demographic features of the participants have been demonstrated in Table 1. The mean age was 19.3±1.4 for girls, 44.2±5.0 for the mothers and 47.9±4.7 for the fathers. 73.4% of the mothers were graduates of elementary school and 81.1% were not working. 51.8% of the fathers were graduates of elementary school and

**Table 1. Socio-Demographic Features of the Participants**

	Mother		Father	
	n	%	n	%
Age X±SD (Min;Max)	44.2±5.0	(34;58)	47.9±4.7	(39;67)
Level of education				
Elementary school	221	73.4	156	51.8
High school	69	22.9	86	28.6
University and above	11	3.7	59	19.6
Occupational status				
Working	44	14.6	203	67.4
Not working	244	81.1	11	3.7
Retired	13	4.3	87	28.9
Age of girls ±SD (Min;Max)	19.3±1.4	(17;22)		

**Table 2. Distribution of Participant Opinions About Vaccination Against HPV**

	n	%
Girl; Status of willingness for getting vaccinated against HPV:		
She wants	131	43.5
She doesn't want	58	19.3
Indecisive	112	37.2
Mother; Status of willingness for getting vaccinated against HPV:		
She is willing	96	31.9
She is not willing	100	33.2
Indecisive	105	34.9
Status of willingness for having her daughter vaccinated against HPV		
She is willing	137	45.5
She is not willing	51	16.9
Indecisive	113	37.5
Father; Status of willingness for having her daughter vaccinated against HPV:		
He is willing	136	44.9
He is not willing	54	18.3
Indecisive	111	36.9

**Table 3. Analyses of the Effects of Various Variables on the Opinions of Girls About HPV Vaccination**

	OR	95% CI	p
Age (years)			
17-19			
20-22	6.4	3.2-12.8	0
Educational level of the mother			
Elementary school High school	1.2	0.2-6.6	0.788
University and above	0.5	0.0-2.9	0.448
Opinion of the mother about getting vaccinated against HPV			
Not willing/Indecisive	0.4	0.1-0.9	0.026
She is willing	0.2	0.1-0.4	0
Opinion of the father about having her daughter vaccinated			
Not willing/Indecisive	0.6	0.2-1.5	0.303
He is willing	0.3	0.2-0.6	0.001
Family history of cervical cancer			
No			
Yes	6.8	0.6-68.6	0.104

\*CI=Confidence Interval, OR=Odds Ratio

3.7% were not working. All the girls were single and not working. Although not shown in the table, 35.5% of the parents had only daughters and 34.6% were living in the Central Anatolia region.

The opinions of participants about HPV vaccination have been presented in Table 2. 43.5% of the girls and 31.9% of the mothers wished to be vaccinated against HPV. 45.5% of the mothers and 44.9% of the fathers were willing to have their daughters vaccinated against HPV.

The results of the multi-variate logistic regression

**Table 4. Distribution of Reasons for the Participants' Opinions About HPV Vaccination**

	n*	%
Reasons for willingness to have HPV vaccination**		
Girls (n=131)		
Protection from HPV infection	131	100
Protection from cervix cancer	85	64.8
Considering needed recommendation by doctor	46	35.1
Mothers (n=137)		
Protecting her daughter from cervix cancer	99	72.3
Protecting her daughter from HPV infection	68	49.6
Considering needed recommendation by a doctor	54	39.4
Considering that her daughter is at a proper age	46	33.6
Considering that her daughter is at risk	12	8.8
Fathers (n=136)		
Protecting his daughter from cervix cancer	85	62
Considering needed recommendation by a doctor	61	44.5
Considering that his daughter is at a proper age	32	23.4
Considering that his daughter is at risk	7	5.1
Reasons for not willing to be vaccinated/being indecisive***		
Girls (n=170)		
Not being sufficiently informed	158	92.9
Not considering herself at risk	36	21.3
Mothers (n=164)		
Not being sufficiently informed	138	84.1
Considering vaccine may have side effects	39	23.8
Not considering her daughter to be at risk	9	5.5
Not believing that the vaccine is beneficial	8	4.9
The vaccine being expensive	7	4.3
Fathers (n=165)		
Not being sufficiently informed	131	79.9
Considering vaccine may have side effects	41	25
Not finding his daughter to be at risk	18	11
Not believing that the vaccine is beneficial	7	4.3
The vaccines being expensive	6	3.6

CI=Confidence Interval, OR=Odds Ratio

analysis performed for investigating the effects of various variables on the opinions of students about getting vaccinated against HPV have been presented in Table 3. The age of the students, the region they lived in, the ages of the mothers and fathers, the educational status and the occupational status, the opinions of the mothers and fathers about having their daughters vaccinated against HPV, and family history of cervical cancer were evaluated together in the logistic regression model. According to these results, the number of girls in the 20-22 age group willing to be vaccinated against HPV was 6.44-fold higher compared to the others (95%CI=3.2-12.8); the number of girls whose mothers wished to have their daughters vaccinated against HPV was 0.21-fold greater compared to girls whose mothers did not wish this or were indecisive (95%CI=0.1-0.4); girls whose fathers wished to have their daughters vaccinated against HPV was 0.31-fold greater compared to girls whose fathers did not wish this or were indecisive (95%CI=0.2-0.6). These findings were found to be statistically significant. The number of girls whose mothers were graduates of high school and who wished to have HPV vaccination was 1.2-fold greater (95%CI=0.2-6.6); the number of girls who had a family history of cervical cancer, willing to have HPV vaccination was 6.80-fold greater than other girls (95%CI=0.6-68.6); however, these findings were found to be statistically insignificant.

The opinions of adolescent girls and parents about HPV vaccination have been presented in Table 4. The most

**Table 5. Analyses of Consistency of Participants' Opinions About HPV Vaccination**

	Opinion of father about daughter being vaccinated						Kappa	p
	Willing		Not willing		Indecisive			
	n	%	n	%	n	%		
Opinion of mother about daughter vaccinated against HPV								
Willing	103	75.2	13	9.5	21	15.3		
Not willing	16	31.4	25	49.0	10	19.6	0.507*	0.000*
Indecisive	16	14.2	17	15.0	80	70.8		
Opinion of the girl about getting vaccinated against HPV								
Opinion of the father about having his daughter vaccinated against HPV								
Willing	86	63.7	12	8.9	37	27.4	0.246*	0.000*
Not willing	17	30.9	19	34.5	19	34.5		
Indecisive	28	25.2	27	24.3	56	50.5		
Opinion of the mother about having her daughter vaccinated against HPV								
Opinion of the girl about getting vaccinated against HPV								
Willing	93	71	19	14.5	19	14.5	0.272*	0.000*
Not willing	10	17.2	12	20.7	36	62.1		
Indecisive	34	30.4	20	17.9	58	51.8		

\*Kappa test

evident reason for willingness to have HPV vaccination is protection from cervical cancer (64.8%, 72.3% and 62% for girls, mothers and fathers, respectively). However, most of the girls (92.9%), mothers (84.1%) and fathers (79.9%) did not want this vaccination as they did not have sufficient knowledge about the vaccine.

Table 5. presents the consistency of opinions of the mothers and fathers about having their daughters vaccinated against HPV and the opinion of the girls about getting vaccinated against HPV. According to kappa values, a moderate consistency was found between the mothers and the fathers ( $k=0.507$ ,  $p<0.05$ ); a lower than moderate consistency was found between the fathers and the girls ( $k=0.246$ ,  $p<0.05$ ), and a lower than moderate consistency was found between the mothers and the girls ( $k=0.272$ ,  $p<0.05$ ). Although not demonstrated in the table, in 23.2% ( $n=70$ ) of the 301 families, every mother, father and daughter were found to want vaccination, and in 3.3% ( $n=10$ ) of the families, they did not wish to be vaccinated.

## Discussion

HPV vaccines were first approved and put on the market in the United States in 2006. After this step, many studies have been conducted investigating the knowledge, attitude and behaviors of parents and adolescent girls about HPV vaccines. Different from other studies, in this study, the opinions of mothers, fathers and girls about HPV vaccination were evaluated together and their consistency with each other was analyzed.

None of the adolescent girls enrolled in this study received the vaccination against HPV. In a study conducted in Turkey, only 0.4% of undergraduates were found to have been vaccinated (Durusoy et al., 2010). In two studies from the United States, 37.7% (Landis et al., 1977) and 16.2% (Caron et al., 2009) of female undergraduates were reported to have received vaccination against HPV. In a study from Denmark, 24% of young women were found

to have received vaccination against HPV (Mortensen, 2010) According to these results, it may be stated that the rate of vaccination among Turkish adolescent girls is low compared to other countries.

In this study, 43.5% of adolescent girls wished to be vaccinated against HPV. Similarly, the rate of willingness to be vaccinated varies in a wide range in the literature, notably 48% (Wong et al., 2010), 49% (Mortensen et al., 2010), 60.2% (Zimet et al., 2010), 68% (Pelucchi et al., 2010), and 81.7% (Di Giuseppe et al., 2008). In this study, the fact that approximately half of the girls wished to be vaccinated against HPV although none of them had been vaccinated suggests that adolescents girls are ready for vaccination. However, 92.9% of adolescent girls stated that their knowledge about HPV infection and HPV vaccines was insufficient and therefore, they had not been vaccinated yet. Caron (2009) reported that the reason for unwillingness to be vaccinated against HPV arose from the need for more information, concerns about vaccine safety or demand for learning the opinion of the doctor about the HPV vaccine (Caron et al., 2009). Knowledge on HPV vaccines has been reported to be a significant factor affecting the decision for vaccination. On the other hand, the individual's finding herself at risk for HPV infection and related diseases is also an important factor affecting the decision for vaccination (Fazekas et al., 2008; Bendik et al., 2011; Pelucchi et al., 2010). In this study, 21.3% of adolescent girls did not wish to be vaccinated against HPV as they did not find themselves at risk. It was deduced from this study that the girls did not find themselves at risk as they were single. This is due to the fact that it is suggested in the Turkish population that girls should not have sexual intercourse prior to marriage (Özan et al., 2004). Bendik (2004) reported in his study that being sexually active and the number of partners affected the women's condition for getting vaccinated or willingness to vaccination (Bendik et al., 2011). The beliefs of adolescent girls that one should be sexually active in order to receive HPV vaccination significantly affected their HPV vaccination.

In this study, the age of the girl, the mothers' wish to be vaccinated and have her daughter vaccinated, and the father wishing to have his daughter vaccinated against HPV has increased the rate of willingness of the adolescent girl to be vaccinated. Bendik (2011) reported that the girl's age, being sexually active, race, approval of parents, friends and partners and recommendation of the parents about vaccination affected the decision for vaccination (Bendik et al., 2011). Similarly, in many studies in literature, the decision of the parents has been reported to play an important role in the willingness of adolescent girls towards vaccination (Breitkopf et al., 2009; Mortensen, 2010; Read et al., 2010).

In this study, 31.9% of the mothers wished to receive vaccination against HPV. In studies conducted in different countries, even in different populations in the same country, the rates of the women's willingness towards vaccination varies. In two studies conducted in Turkey, 6% (Onan et al., 2009) and 69% (Dursun et al., 2009) of women stated that they wished to be vaccinated. In another study conducted in the United States, 48% (Kahn et al., 2009) and 73% (Watts et al., 2009) of women were willing

to be vaccinated against HPV.

In this study, 45.5% of the mothers and 44.9% of the fathers wished to have their daughters vaccinated against HPV. Similarly, 24.6 - 68% of women were found to wish vaccination for their daughters in studies conducted in Turkey (Onan et al., 2009; Dursun et al., 2009). In the literature, the rates of for mothers' willingness to have their daughters vaccinated against HPV vary between 70% and 88% (Fazekas et al., 2008; Watts et al., 2009; DiAngi et al., 2011) and that for fathers to be between 90% and 94% (Pelucchi et al., 2010; Perkins et al., 2012). However, there are also studies indicating lower (Dempsey et al., 2009) and higher rates (Pelucchi et al., 2010).

In this study, mothers and fathers mostly stated that the reasons for willingness to have their daughters vaccinated were 'to protect from cervical cancer' and 'to protect from HPV infection'. This finding suggests that knowing the relationship between HPV infection and cervical cancer is important for parents to accept vaccination. Similarly, in other studies, parents stated that they wanted vaccination mostly for protecting their daughters from cervical cancer (Di Giuseppe et al., 2008; Watts et al., 2009; Dempsey et al., 2009). In this study, the doctor's recommendation for vaccination is an important determinant for parents to decide upon vaccination. There are also other studies indicating that the recommendation of the health personnel, especially doctors, effect on the decision of the parents about having their daughters vaccinated (Ogilvie et al., 2007; Dempsey et al., 2009; Trim et al., 2012). This finding supports the suggestion that health personnel have an important role in enlightening individuals about HPV vaccine and HPV infection, and to discuss their prejudice and beliefs.

In this study, the parents mostly stated that they did not wish to have their daughters vaccinated as they did not have sufficient knowledge or they considered that the vaccine may have side effects. This finding indicates that finding the vaccine safe and effective is an important factor. In another study conducted in Turkey, most mothers were found to be unwilling towards vaccination as they had no knowledge about the vaccine (Onan et al., 2009).

In this study, 5.5% of mothers and 11% of fathers did not want vaccination as they did not find their daughters to be at risk. Studies in Turkey show that the rate of sexual intercourse varies between 2.5% and 16% among female undergraduates and between 19.3% and 70% among male undergrads (Şimşek et al., 2007; Pınar et al., 2009). This socio-cultural structure is considered to make parents think that their daughters are not at risk. Similarly, in the study of Onan (2009) conducted in Turkey, 16.4% of parents stated that they did not want vaccination as their daughters were not sexually active (Onan et al., 2009). Apart from the effects and side effects of the vaccine, it is considered that educating the parents about the proper age range for application of the vaccine prior to the start of sexual activity in order to increase its effectiveness would be effective on the decision about vaccination.

The opinions of the parents about having their daughters vaccinated and the opinions of adolescent girls about getting vaccinated are congruent with each other.

The decisions of the parents about having their children vaccinated may be affected by cultural, social factors and beliefs about the disease. Thus, in populations like Turkey in which the family concept is important, the values of family members are considered to be affected by each other. Despite the fact that there is no similar study in the literature evaluating the decision for vaccination between mothers and daughters, there are studies indicating that there is consistency between the mothers and fathers in terms of opinions on vaccination (Breitkopf et al., 2009; Perkins et al., 2012). Breitkopf et al. (2009) reported that 91% of parents of whom all were healthcare personnel believed that their and their partners' decisions would be similar, and 77% believed that their decisions and decisions of their daughters would be similar (Breitkopf et al., 2009). Furthermore, 95% of parents who did not need to confer to their partners for the decision towards vaccination were reported to be compatible with each other. Despite having questioned their opinions together, Read (2010) did not evaluate the consistency between the opinions of adolescent girls aged 13-19 years and their parents. Read (2010) reported in his study that 44.5% of adolescent girls wished to receive vaccination against HPV and 37.5% of parents wished to have their daughters vaccinated against HPV (Read et al., 2010). In this study, the congruency between the girls and the parents was lower than the congruency between the mother and the father. This difference is considered to have arisen from the fact that girls are far from home and estranged from the cultural structure of the family. The fact that these girls were nursing students is also considered to have led to a difference between their own decisions and the decisions of their parents.

In conclusions, the results of this study indicate that a proper background has been partially provided about the acceptability of the vaccine between the parents and the daughters in Turkey. However, the vast majority of adolescent girls and parents are indecisive or reluctant towards vaccination. Adolescent girls and their parents state that their knowledge on vaccination is not sufficient to make a decision. Additionally, adolescent girls and their parents are reluctant to receive vaccination against HPV, a sexually transmitted disease, as the girls do not find themselves at risk and the parents do not think their daughters are at risk. Hence, they should be informed about the effects/side effects of the vaccine, the proper age range and that girls should be vaccinated before commencing sexual activity, so as to increase the effectiveness of the vaccine. This study also indicates that the decisions of adolescents about vaccination may be affected by the parents' opinions. Thus, it is considered that it is necessary to provide sufficient and correct information about the vaccine, not only for adolescent girls who are the target population, but also for their parents.

The results of the study reflect the opinions of a group of Turkish adolescents and their parents. Hence, these results cannot be generalized for Turkey overall. Although the data used in this study are based on self-reporting, the data from the parents were collected by their daughters. This type of data collection may have affected the answers of the parents. Therefore, it is recommended to evaluate

together the opinions of adolescent boys and girls who have different socio-demographic and cultural features and their parents.

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