

## Attitudes towards influenza vaccination in high socioeconomic status Turkish parents

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**Background/aim:** To better understand the knowledge, attitudes, and demographic factors that influence the rate of influenza vaccination among high socioeconomic status parents.

**Materials and methods:** questionnaire exploring the attitudes of parents to the influenza vaccine, and their knowledge about influenza and its vaccination, was given to parents of children from 1 through 16 years of age attending the Turgut Özal University Hospital after the 2011/12 influenza season.

**Results:** In the present study, 285 mothers and their children participated and 8.8% (n = 25) of children had the influenza vaccination. Between the vaccinated and nonvaccinated groups, there were statistically significant differences for having received the recommendation of the physician, consulting with the physician, having the influenza vaccine previously, and having a chronic disease. The most common misconceptions of the parents about the vaccine were; there being no need for it, it not being useful, it having no effect, and it being harmful. Parents' knowledge about influenza and the influenza vaccine were not satisfactory.

**Conclusion:** Reliable information from both health care providers during visits and the media about influenza, its severity, and the effectiveness and side effects of its vaccine should be provided.

**Key words:** Influenza vaccine, high socioeconomic status, attitudes

### 1. Introduction

Influenza, which is a contagious respiratory illness caused by influenza viruses, is an important cause of epidemic and pandemic disease, leading to substantial mortality and morbidity (1,2).

Influenza viruses can cause disease in all age groups. Rates of infection are highest among children, but risks for complications, hospitalizations, and deaths from seasonal influenza are higher among adults over 65 years of age, children under 5 years of age, and people of any age who have medical conditions that place them at increased risk for complications for influenza (3–9).

Annual influenza vaccination is the most effective method for preventing influenza virus infection and its complications (10). Influenza vaccine is recommended for all persons aged more than 6 months who do not have contraindications to vaccination (1).

During the 2010/11 influenza season, the American Academy of Pediatrics recommended annual trivalent seasonal influenza immunization for all children and

adolescents above 6 months of age (1). In Turkey, the Ministry of Health provides the influenza vaccine to health care providers, people older than 65 years of age, and people who have a chronic disease such as asthma, cardiac disease, or diabetes, free of charge.

Around the world, and also in Turkey, the rate of influenza vaccination in children is not high enough (11). We thought that among people of high socioeconomic status, vaccine approval should be sufficiently high, and we intended to identify the possible factors associated with influenza vaccine refusal in high socioeconomic status parents in Turkey. In the current study, we aimed to better understand the knowledge, attitudes, and demographic factors that influence the rate of influenza vaccination.

### 2. Materials and methods

#### 2.1. Study group

This study was conducted in the general pediatric department and pediatric emergency department of Turgut Özal University Hospital, in Ankara, Turkey, after

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the 2011/12 influenza season between March and August.

First of all, the education level of the parents and the family's monthly income were determined. Inclusion criteria were:

- Children aged between 1 year and 16 years of age,
- At least one of the parents has graduated from university,
- Monthly family income must be high for Turkey (according to the Turkish Statistical Institute, in the first 20th percentile) (12).

## 2.2. Methods

After written consent was obtained from the mothers who participated, a questionnaire exploring the attitudes and knowledge of the parents about the influenza vaccine was administered by a pediatrician. The questionnaire included open- and closed-ended questions that identified demographic characteristics, parental knowledge about influenza and its vaccination, and factors influencing decisions on vaccinating. We also inquired as to whether the child had a chronic disease, whether the child was going to school or daycare, whether the child had received other private vaccines, and whether the parents had asked their physicians about influenza vaccine and what the recommendation of their physicians was.

We classified the patients into 2 groups: the children who had received the influenza vaccine in that influenza season were categorized as group 1, and the children who were not vaccinated were categorized as group 2.

## 2.3. Statistical analysis

The data were analyzed using SPSS 16.0 for Windows (SPSS Inc., Chicago, IL, USA). Continuous variables are presented as mean  $\pm$  standard deviation and categorical variables are presented as %. In statistical analysis, the chi-square test was performed. Statistical significance was considered as  $P < 0.05$ .

The study was approved by the ethics committee of Turgut Özal University.

## 3. Results

In the present study, 285 mothers and their children participated. The mean ages of the mothers and children were  $35.6 \pm 5.4$  and  $6.0 \pm 3.3$  years, respectively.

Eight percent of children were under 2 years, 46.3% were between 2 and 5 years of age, and 46% were older than 6 years. While half of the parents had 2 children, 40% had only 1 child.

Only 13.7% had a chronic disease such as asthma, cardiac disease, or diabetes. The remainder were healthy.

Seventy-seven percent ( $n = 221$ ) of the children attended a daycare center or school and 16% were in their first year of daycare or school.

All of the children had vaccines appropriate for their age, applied by the Ministry of Health free of charge,

except rotavirus, varicella, hepatitis A, influenza, and human papilloma virus vaccines. In our center, we apply the rotavirus vaccine, varicella vaccine, hepatitis A vaccine, and influenza vaccine optionally and with payment, while all other vaccines are applied by the Ministry of Health free of charge.

Of the children who participated in the study, 8.8% ( $n = 25$ ) had received the influenza vaccine and were categorized as group 1. The remainder were in group 2. Among these vaccinated children, only 2 of them had side effects related to the influenza vaccine; additionally, among all 20.4% ( $n = 58$ ) of children who had received the influenza vaccine previously, 7 of them had side effects. Only 56% of children who had the vaccine previously had the vaccine again in the study year ( $P < 0.001$ ).

The percentage of children with chronic disease who had the influenza vaccine was 40% and this was statistically significant ( $P = 0.001$ ). The percentage of children with chronic disease who had a positive recommendation from a physician was 30.8%, while those with a negative recommendation was 35.9% ( $P = 0.037$ ).

The rates of children having the varicella vaccine, hepatitis A vaccine, and rotavirus vaccine were 81%, 75%, and 37%, respectively. Among children who had the influenza vaccine, the percentages who also had varicella, hepatitis A, and rotavirus vaccinations were 100%, 92%, and 48%, respectively ( $P < 0.05$  for all 3 of them).

Eighty-eight percent of children who received the influenza vaccine were attending school ( $P = 0.19$ ).

In this study, 60% ( $n = 171$ ) of parents had relatives who were health care professionals, and only 16% of these relatives recommended the influenza vaccine.

Only 19% of parents had consulted with their physician about the vaccine, while 80.1% had not.

Only 18% of physicians recommended the influenza vaccine positively, while 33% did not, and half of them did not communicate about the vaccine.

In children, 31% ( $n = 89$ ) had influenza (as reported) in the 2011/12 influenza season.

Of the different age groups of the children, only 1 (4.5%) of those under 2 years of age, 10 (7.6%) of those aged between 2 and 6 years of age, and 14 (10.7%) of those aged 6 and older had the influenza vaccine in the influenza season.

Only 56% of children who had the vaccine previously had it again in the 2011/12 season ( $P = 0.000$ ). Of the children who had side effects from previous vaccinations, 35.7% had the vaccination again ( $P = 0.07$ ).

Eight (32%) of the children who had the vaccine in the study year had influenza (as reported) ( $P = 0.94$ ).

Among 46% of children who were vaccinated, close relatives who were health care professionals had recommended the vaccine positively ( $P = 0.160$ ).

Only 56% of children who were vaccinated had had their parents consult with their physicians ( $P < 0.001$ ).

The physicians had recommended the vaccine for 72% of children who had the vaccine, while 12.7% of children were not vaccinated despite a positive recommendation from a physician ( $P < 0.001$ ).

The comparison of vaccinated patients (group 1) and nonvaccinated patients (group 2) is given in Table 1.

Between the vaccinated and nonvaccinated groups, the recommendation of the physician, consultation with the physician, having had influenza vaccine previously, and having a chronic disease were the statistically significantly differences.

We inquired into the beliefs of the parents whose children did not have the influenza vaccine. Relevant data are shown in Table 2.

We think that there are misconceptions about the influenza vaccine not only among low socioeconomic status parents, but also among high socioeconomic status parents. In Table 3, the knowledge of parents about the influenza vaccine is summarized.

There are many misconceptions about the side effects of the influenza vaccine. The knowledge of mothers about the side effects of the influenza vaccine is summarized in Table 4.

#### 4. Discussion

In the present study, 18% of patients' physicians recommended the vaccine without being consulted, and

this rate is too low. Only 19.2% of patients' parents consulted with the physician about the influenza vaccine. Among the vaccinated group, 72% had had the vaccine recommended by their physician, while 12.7% had not been vaccinated despite the recommendation of a physician. Physicians' beliefs may contribute to parental decisions to accept, delay, or forgo vaccinations. The physician should recognize the effectiveness and harmlessness of the vaccine and should share this information with patients readily (1,13–17). As shown in previous studies, a physician's recommendation of the influenza vaccination is the most important factor in patients deciding to have an influenza vaccination (16,17). A prior study from Turkey reported the rate of pandemic influenza vaccination among the children of health care professionals. Among 389 participants, only 27% had been vaccinated against pandemic influenza A/H1N1. Two-thirds (66%) of the parents answered that they would not vaccinate their children, while only 21.1% had already vaccinated their children. Concerns about side effects and efficacy of influenza vaccinations were the major reasons for refusing vaccination (18).

Children with chronic diseases and children younger than 2 years of age are at an increased risk of hospitalization and complications attributable to influenza (1). In our study group, only 13.7% had chronic disease, and the percentage of positive recommendations by doctors for the children with chronic disease was 30.8%, while the rate of negative recommendations was 35.9% ( $P = 0.037$ ). Among children with chronic disease, 40% had the influenza vaccine, and

**Table 1.** The comparison of group 1 and group 2 patients for social and clinical data.

Social and clinical data	Group 1 (n = 25)		Group 2 (n = 260)		P*
	n	%**	n	%**	
Having chronic disease	10	40.0	29	11.2	0.001
Going to daycare center or school	22	88.0	199	76.5	0.143
Having rotavirus vaccine	12	48.0	94	36.2	0.170
Having varicella vaccine	25	100.0	206	79.5	0.006
Having hepatitis A vaccine	22	91.7	193	79.1	0.183
Having influenza (as reported)	8	32.0	81	31.2	0.546
Having influenza vaccine previously	14	56.0	44	16.9	0.000
Having side effects from previous influenza vaccine***	5	35.7	2	4.5	0.007
Consulting with their physician	14	56.0	41	15.7	0.000
Recommendation of the physician for vaccination	18	72.0	33	12.7	0.000
Recommendation of relatives who are health care workers for vaccination****	6	46.2	39	24.7	0.175

\*: Chi-square test.

\*\* : The percentage for that column.

\*\*\* : Of % previously vaccinated.

\*\*\*\* : Of % with relatives working in health care.

**Table 2.** The beliefs of parents whose children did not have the influenza vaccine.

Reason	n	%
No need	64	24.9
Not useful	50	19.2
Harmful	47	18.0
No effect	41	15.7
Nobody recommended it	26	10.0
Forgot	10	3.8
Expensive	2	0.8
More than 1 answer	20	7.6
Total	260	100.0

this is almost the same as in the US and UK populations (19,20). Despite the low rate of influenza vaccination among the general population, immunization is as high as in developed countries in the chronic disease population. In a study about the parental perspectives on influenza vaccination in children with asthma from Turkey, Soyer et al. showed that in this group the rate of vaccination was 51.8% and the most important reason for deciding to pursue influenza vaccination was the recommendation of the physician (80.1%) (21). In our study, rates of negative recommendations from physicians are as high as positive recommendations for chronically ill children. Attitudes of physicians of chronically ill children should be studied in future studies.

Our study took place after the 2011/12 influenza season, between March and August. Before this season, in 2009/10, there was a global spread of influenza A (H1N1) around the world and 656 deaths occurred in Turkey during the pandemic; 35% of the deceased had no chronic disease. Among these deaths, 11.8% were in children under 4 years old and 4.5% were in children between 5 and 24 years of age. According to the Turkish Ministry of Health, pandemic vaccine coverage among children younger than 14 years of age remained at 3.1% (22). According to a study about the macroepidemiology of influenza vaccination, 19 influenza vaccines were distributed per 1000 persons in Turkey, whereas it was 286 doses per 1000 persons in the United States in 2003 (11).

In the present study, almost half of the patients who did not have the influenza vaccine had had the vaccine in the previous year. We think the perceptions of parents are influenced by many things. Therefore, the state should determine an in-depth vaccination policy and should act in concert with others, such as health care providers and social communication networks.

In Turkey, most people mistake influenza with the common cold. Thus, they do not know the severity of influenza, and when they have a common cold after vaccination, they attribute this illness to the vaccination. In our study group, among all children, 31% had influenza in the 2011/12 influenza season. We described the symptoms of influenza and wanted to know if their children had had it. In the present study, the influenza rate could be lower than that reported, because there was no laboratory confirmation or clinical diagnosis by a physician.

**Table 3.** Knowledge of parents about the influenza vaccine.

Questions (n = 285)	Type of answer	n	%
Season of influenza vaccine	Correct answer	209	73.3
	Wrong answer	16	5.6
	No idea	60	21.1
Annual vaccination should be done	Correct answer	248	87.0
	Wrong answer	12	4.2
	No idea	25	8.8
Vaccine can prevent all influenza serotypes	Correct answer	225	78.9
	Wrong answer	22	7.7
	No idea	38	13.4
Vaccine can cause influenza	Correct answer	107	37.5
	Wrong answer	161	56.5
	No idea	17	6.0
Only vaccine can prevent influenza	Correct answer	8	2.8
	Wrong answer	273	95.8
	No idea	4	1.4

**Table 4.** Knowledge about side effects of influenza vaccines.

Side effect	n	%
No idea	91	31.9
No side effects	14	4.9
Fever	34	11.9
Allergy	23	8.1
Influenza	20	7.0
Fever + rash + influenza + allergy	19	6.7
Fever + influenza	16	5.6
Fever + rash	11	3.9
Rash	6	2.1
Others	51	17.9
Total	285	100.0

The role of children as the main sources of influenza transmission within a community or household has been referenced in many studies (23–25). Although three-quarters of children were attending a school or daycare center, and half of them were under 5 years old, their rate of having the influenza vaccination was very low. We also think that this is the main source of influenza transmission in children.

Our study population was of high socioeconomic status. It is the parents who decide whether their children will receive a vaccine or not. It has been previously shown that as the level of education and access to information increases, parents are more willing to question the vaccines and medications that are offered to their children and want to participate more in the decision-making process (26). Their attitudes are also known to be influenced by medical and social factors (18,27). In previous studies, it was shown that people with higher education levels were more likely to immunize their children with the influenza vaccine (18,27). Most of our patients' parents were very sensitive about their children. When the physician recommended something, they frequently tried to do it.

The percentages of children who also had varicella, hepatitis A, and rotavirus vaccinations were 100%, 92%, and 48%, respectively ( $P < 0.05$  for all 3 of them). When the acceptance rate of the other optional vaccines is high, the acceptance rate of the influenza vaccine is usually also high. However, our study revealed a low (8.8%) influenza vaccination rate among children.

We wanted to know the reasons for refusing the influenza vaccine in the nonvaccinated group ( $n = 260$ ). The major reasons for refusing vaccination were having no need for it, not thinking it useful, thinking it had no effect, and thinking that it was harmful. Among all parents, more than half of them thought that the vaccine could cause influenza. In a review article about vaccine refusal, Omer

et al. showed that parents of exempt children thought that their children had a low susceptibility to the disease, that the severity of the disease was low, and that the efficacy and safety of the vaccine were low (26). In another study in which immunization barriers and solutions were discussed, the lack of knowledge about immunizations, fears about vaccine safety, and logistical problems that limit access to immunization services were the main barriers (28). In a study from Turkey, concerns about side effects and the efficacy of influenza vaccinations were major reasons for refusing vaccination (17).

We think that the cause of the belief that children do not need the vaccine is parents not knowing the severity of influenza and mistaking the common cold with influenza. In previous studies, the association between parental fears and low usage of seasonal influenza vaccine was revealed (29,30).

In the present study, the vaccination rate was high in children older than 2 years of age, especially so among children who were more than 6 years old. Similarly, in the study group of Akis et al., parents were more likely to have older children vaccinated (18). This may either be due to parental perception about younger children being more prone to vaccine side effects or to the belief that it is easier to keep younger children at home. As the child grows older, the frequency of attending a daycare center or school increases, which may in turn change the parent's perception about the vulnerability of the child to the disease. A study carried out in Canada on barriers to vaccination of children showed that parental beliefs, including the idea that babies are too small, immature, or fragile to handle immunizations, might have an effect on low vaccine coverage rates (31). On the other hand, age-specific seasonal influenza vaccine coverage rates of children aged between 6 and 59 months in the United States in 2008/09 revealed a low coverage rate among children who were older. This difference was attributed to the more frequent physician visits of the infants, which may result in a higher chance of completing the vaccine series (32).

Nonpharmacological interventions, such as frequent hand washing and improved respiratory hygiene, are reasonable and inexpensive strategies for the reduction of influenza viruses. However, these precautions should not be advocated as replacements or alternatives to specific measures such as vaccination (1,33,34). In the present study, 95.6% of parents thought that vaccination was not the most effective measure against the influenza virus. They thought that measures such as hand washing, staying away from crowded places, and staying away from sick people were more effective than vaccination. In a study about parental acceptance of pandemic influenza vaccine, Akis et al. also showed that parents who refused vaccination thought measures other than vaccination were more effective for preventing the disease (18).

Parents' knowledge about the side effects of the influenza vaccine was investigated. One-third of parents had no idea about side effects, and only 4.9% thought there were no side effects. Fever, allergy, influenza, and a combination of these were thought to be often encountered as side effects. In the literature, it is emphasized that the trivalent influenza vaccine is an inactivated vaccine that contains no live virus and cannot produce a viral infection. The most common adverse events after administration are local injection-site pain and tenderness. Fever might occur within 24 h after immunization in approximately 10% to 35% of children younger than 2 years of age, but rarely in older children and adults. Mild systemic symptoms such as nausea, lethargy, headache, muscle aches, and chills might occur after administration of the trivalent influenza vaccine (1).

There are some limitations of this study. It took place in a single center and among a small group. The

diagnosis of influenza was not confirmed by a physician or by laboratory tests. Symptoms were explained by the physician to the parent, who was asked if the child had had influenza or not.

In conclusion, the influenza immunization rate is not high enough in children with high socioeconomic status. Immunization rates are improved by direct communication between health care providers and vaccine recipients (or parents of recipients) with respect to the need for immunizations and clear communication of risks and benefits. Reliable information during visits with health care providers, and also information from the media, about influenza, its severity, its vaccine, and its vaccine's effectiveness and side effects should be given. We think that, as in other health-related subjects, the influence of health care providers and the information that they provide are the most effective ways of increasing vaccine acceptance.

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