



The Evaluation of the Vaccine Hesitancy among Parents of Children Aged 0-14

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ABSTRACT

Objectives: This study aims to assess vaccine hesitancy among parents of children aged 0–14 and its related factors.

Methods: This study is a cross-sectional study conducted among parents of children aged 0–14 who consulted the Eskişehir Osmangazi University Family Medicine Polyclinic between April 1 and September 30, 2022. The questionnaire form comprises sociodemographic characteristics and questions regarding vaccines. The World Health Organization Vaccine Hesitancy Scale was used to determine the frequency of vaccine hesitancy among the parents.

Results: A total of 375 parents were assessed. In the study, 11 (2.9%) of the parents had at least one child who had not been vaccinated. Parents with unvaccinated children had a vaccine hesitancy score of 41.0 (17.0) and parents with vaccinated children had a vaccine hesitancy score of 42.0 (8.0) ($p=0.201$). Parents who used the Internet as a source of information about vaccines had lower vaccine hesitancy scale scores than those who did not (40.0 [8.0] vs. 43.0 [8.0], $p<0.001$). In addition, the vaccine hesitancy score of parents who received vaccine-related information from health professionals was significantly higher (43.0 [8.0] vs. 40.0 [11.5], $p=0.001$).

Conclusion: Obtaining vaccine-related information from health-care professionals rather than the Internet or other sources could lead to significant progress in combating vaccine hesitancy among parents.

Keywords: Family practice, vaccination hesitancy, vaccination refusal



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INTRODUCTION

The World Health Organization (WHO) states that between 3.5 and 5 million deaths are prevented every year through immunity.^[1] However, the global rate of immunization fell from 86% in 2019 to 81% in 2021, whereas the number of children who had not been vaccinated at all rose by 5 million between 2019 and 2021.^[2] One of the important reasons for the fall in vaccinations, which has become more widespread in the last 20 years, are the notions of “vaccine hesitancy” and “vaccine refusal.” According to WHO definitions, while “vaccine refusal” is the situation where a person refuses to accept any vaccinations of his/her own free will, “vaccine hesitancy” is the situation where there is a delay in having certain vaccinations carried out or not permitting certain vaccinations, despite having access to them. The WHO, which has conducted studies on this subject due to the increase in vaccine hesitancy in recent years, stated in 2019 that one of the 10 factors that could threaten global health was “vaccine hesitancy.”^[3] The number of measles cases rose by 3 times in Europe between the years 2016 and 2017. It has been determined that 87% of the cases of measles are those who had refused to be vaccinated.^[4] The WHO established the “The Strategic Advisory Group of Experts on Immunization Vaccine Hesitancy Working Group” in 2012 due to the increase in vaccine hesitancy in recent years, and one of the most important activities of this group has been to develop the Vaccine Hesitancy Scale as a common measurement tool.

The opposition to vaccines is increasing rapidly in Türkiye following the winning of a lawsuit concerning the requirement to obtain consent from the parent before vaccinations in 2015 and in particular, as a result of the frequent citing of anti-vaccination statements in the media in the last 10 years.^[5] The number of families who did not want their children to be vaccinated rose from just 183 in 2011 to around 23.000 in 2018. For this reason, there is an increase in the number of diseases that can be prevented by vaccination and the related deaths and disabilities. An example is the increase in measles cases in recent years. While measles cases did not exceed 10 between 2007 and 2010, the number of cases increased significantly after 2011. After 2012, cases continued to increase with immigration to Türkiye, and 1005 cases were seen in 2013.^[6] The measles vaccine was added to the national vaccination calendar for 9-month-old babies. Unfortunately, vaccinations were interrupted after the February 6 earthquake in Türkiye, and measles cases reached 7.885 in the first 6 months of 2023.^[7] This situation has once again shown us the importance of primary health care and vaccination.

One of the important reasons for decreasing vaccinations in recent years is vaccine refusal and hesitancy.^[3] It is important to determine the prevalence of vaccine refusal and vaccine hesitancy, which have started to threaten the health of the community with their increase both in the world and in Türkiye, as well as determine the reasons for hesitancy and understand the factors behind the rise in this hesitancy. The aim of this study is to evaluate vaccine hesitancy among parents with children between the ages of 0–14, who consulted the Eskişehir Osmangazi University Family Medicine Polyclinic.

METHOD

This cross-sectional study was conducted among parents of children aged 0–14 who consulted the Eskişehir Osmangazi University Family Medicine Polyclinic between April 1 and September 30, 2022. Parents with children aged 0–14 years and over 18 years were included in the study. Cognitive dysfunction and illiterate parents were excluded from the study.

The data were collected by giving the parents a questionnaire and asking them to complete it. The researcher created a sociodemographic data form with the aim of learning the demographic information of the participants. The matters asked and recorded in the study were the age, gender, education status, number of children, and income status of the participants, whether they owned the home they lived in, the place they had lived for the lengthiest period during their life (small town, village, and city), their vaccination

status, the sources which affected their decisions on vaccines (Internet, television, health professional, friends and relatives, religious leaders, newspapers and magazines, and other), whether they knew anybody who did not have their children vaccinated, whether they had failed to have at least one of their children vaccinated with a complete set of vaccines despite these vaccines being on their vaccination schedule and any side effects experienced (none, mild, and severe) by their children after any vaccinations. The age of the parents and the number of children were recorded numerically.

The Vaccine Hesitancy Working Group developed the WHO Vaccine Hesitancy Scale.^[8] It also stated that the scale would need to be tested to ensure it was valid in all countries. In line with this warning, the validity and reliability studies of the Vaccine Hesitancy Scale in Turkish were conducted in four separate stages in Türkiye.^[9–12] This study uses the WHO Vaccine Hesitancy Scale in Turkish, which was adapted to Turkish culture and has been shown that it could be used by Turkish parents, by Aslan et al. The responses to this scale, which is comprised 10 questions, were of a Likert type with 5 grades between “I definitely agree” and “I definitely disagree.”^[10] While questions number 5, 9, and 10 on the scale contained negative statements, all of the other questions contained positive ones. The level of vaccine hesitancy fell as the grades given in response to the positive statements increased, whereas the level of hesitancy rose as the grades given in response to the negative statements increased. Therefore, responses number 5, 9, and 10 are reverse coded. Thus, as the total number of marks obtained from the scale increases, the level of vaccine hesitancy falls. There is no cutoff point separating those who are hesitant from those who are not within the scale.

The data were analyzed using the Statistical Package for the Social Sciences Version 22 package program. Frequency, percentage, mean, standard deviation, median, and interquartile range were used for descriptive statistical methods. A Chi-square test was used for the comparison of the qualitative values. The relationship between the variables was tested using the Spearman correlation analysis. The Mann–Whitney U test was used in the analyses between two groups, and the Kruskal–Wallis test was used in the comparisons between more than two groups, as the data in the comparisons did not display a normal distribution. A $p < 0.05$ was considered statistically significant.

RESULTS

In this study, 375 parents were included. The sociodemographic characteristics of the parents are summarized in Table 1.

Table 1. The sociodemographic characteristics of the parents

	Median (IQR)
Age (years)	39.0 (11.0)
Number of children	2.0 (0.0)
Gender, n (%)	
Female	259 (69.1)
Male	116 (30.9)
Education status, n (%)	
Literate	1 (0.3)
Primary school	52 (13.9)
Secondary school	41 (10.9)
High school	75 (20.0)
University	206 (54.9)
Income status, n (%)	
Income lower than expenses	113 (30.1)
Income and expenses equal	198 (52.8)
Income higher than expenses	64 (17.1)
The house they live in owns to them, n (%)	
Yes	120 (32.0)
No	255 (68.0)
The place where they live, n (%)	
Small town	40 (10.7)
Village	61 (16.3)
City	274 (73.0)

When the parents' own vaccination status was evaluated, 18 (4.8%) stated that they were vaccinated, 273 (72.8%) stated that they were not vaccinated, and 84 (22.4%) stated that they could not remember. The knowledge and opinions about vaccines of the parents are summarized in Table 2.

The median of the WHO Vaccine Hesitancy Scale score was 42.0 (8.0). No relationship was found between the WHO Vaccine Hesitancy Scale with age and number of children ($p=0.706$, $p=0.763$, respectively). The sociodemographic and vaccine-related characteristics of the WHO Vaccine Hesitancy Scale score are summarized in Table 3.

When the vaccination status of children was evaluated, it was found that 11 (2.9%) had at least one vaccine that had not been given to at least one child, 349 (93.1%) had vaccines and 15 (4.0%) had unknown. The sociodemographic and vaccine-related characteristics of parents allowed to vaccinate their children are summarized in Table 4.

Table 2. The knowledge and opinions about vaccines of the parents

	n (%)
The sources influencing the decisions of the parents concerning vaccines*	
Internet	107 (28.5)
Television	59 (15.7)
Health professional	309 (82.4)
Friends and relatives	50 (13.3)
Religious leaders	12 (3.2)
Newspapers and magazines	19 (5.1)
Other	43 (11.5)
Recognize someone who has not vaccinated their children	
Yes	83 (22.1)
No	145 (38.7)
Unknown	147 (39.2)
Vaccine-related side effect	
None	269 (71.8)
Mild	104 (27.7)
Severe	2 (0.5)

*Each item was evaluated individually.

DISCUSSION

The aim of this study is to evaluate vaccine hesitancy among parents with children between the ages of 0–14.

In this study, no significant relationship was found between the education status of the parents and their scores on the WHO Vaccine Hesitancy Scale in Turkish. Similarly, no significant relationship was found between the presence of a minimum of one vaccination of parents who had not allowed at least one of their children to be given despite these vaccines being in the vaccination schedule and the education status of the parents. However, in the study conducted by Aslan et al., it was determined that most of the parents who were hesitant to allow their children to be vaccinated were mothers with an education status of primary school or less.^[10] In the study conducted by Luman et al., it was shown that there were more delays to childhood vaccinations as the education status of the participants decreased.^[13] While a significant relationship was not found in this study, a relationship has been shown between the education levels of parents and the health and vaccination frequency of their children in numerous studies.

Table 3. Sociodemographic and vaccine-related characteristics of the World Health Organization vaccine hesitancy scale score

	Median (IQR)	p
Gender		
Female	42.0 (9.0)	0.978 [†]
Male	42.0 (8.0)	
Education status		
Primary school	40.0 (10.0)	0.247 [†]
Secondary school	40.8±4.8	
High school	42.0 (8.0)	
University	43.0 (8.0)	
Income status		
Income lower than expenses	42.0 (7.0)	0.904 [†]
Income and expenses equal	42.0 (9.0)	
Income higher than expenses	42.0 (8.8)	
The house they live in owns to them		
Yes	42.0 (9.0)	0.067 [†]
No	43.0 (9.0)	
The place where they live*		
Small town	39.5 (6.8)	0.043 [‡]
Village	42.0 (8.0)	
City	42.5 (8.0)	
The sources influencing the decisions of the parents concerning vaccines		
Internet		
No	43.0 (8.0)	<0.001 [†]
Yes	40.0 (8.0)	
Television		
No	42.0 (8.0)	0.313 [†]
Yes	41.0 (7.0)	
Health professional		
No	40.0 (11.5)	0.001 [†]
Yes	43.0 (8.0)	
Friends and relatives		
No	42.0 (8.0)	0.648 [†]
Yes	43.0 (7.3)	
Religious leaders		
No	42.0 (8.0)	0.988 [†]
Yes	41.0 (6.3)	
Newspapers and magazines		
No	42.0 (8.0)	0.159 [†]
Yes	42.0 (8.0)	
Other		
No	42.0 (8.0)	0.223 [†]
Yes	42.0 (9.0)	
Vaccine-related side effect		
No	42.0 (8.0)	0.190 [†]
Yes	42.0 (8.8)	
Recognize someone who has not vaccinated their children		
Yes	44.0 (8.0)	0.001 [‡]
No	40.0 (9.0)	
Unknown	41.0 (8.0)	
Unvaccinated child		
No	42.0 (8.0)	0.201 [†]
Yes	41.0 (17.0)	

*Small town vs. city p=0.012.

[†]Mann Whitney U test, [‡]Kruskal Wallis test.

In this study, the frequency of parents who did not allow at least one of their children to be given a complete set of vaccines despite the fact that it was included in the vaccination schedule was found to be 2.9%, whereas the frequency of those who had allowed all of their children to have all of the vaccinations was found to be 93.1%. The frequency of parents whose children had received all vaccinations was found to be 94% in the study conducted by Üzümlü et al., and this is similar to the results from this study.^[14]

A significant relationship was found between the parents who did not allow at least one of their children to be given a complete set of vaccines despite the fact that these were included in the vaccination schedule and the side effects which had occurred in the vaccinations to their children. In the study conducted by Özkan and Çatıker in 2006, it was found that 71.6% of parents whose children had either not been vaccinated at all or whose vaccines were incomplete, were worried about the side effects of vaccines.^[15] Similarly, it was also found that half of the parents who did not allow their children to be vaccinated were worried about side effects, in the study by Aslan et al.^[10] In a study conducted in Sweden in 2016, it was revealed that 74.7% of the parents who refused vaccines were worried about their side effects.^[16] In a manner which supports these other studies, it was also shown in this study that the probability of parents not allowing their children to be vaccinated increased if those parents had experienced side effects.

A significant relationship was found between those influenced by the Internet in their decisions on vaccines and their scores on the WHO Vaccine Hesitancy Scale in Turkish, and the vaccine hesitancy of those influenced by the Internet was found to be significantly higher. In a similar manner to this study, it was also shown that parents obtained information concerning vaccines from the Internet and that the negative information on the Internet had been effective in their refusal of vaccines, in a study conducted in the Czech Republic in 2015.^[17] A significant relationship was found between those influenced by health professionals and their scores on the WHO Vaccine Hesitancy Scale in Turkish, and vaccine hesitancy among those influenced by health professionals was found to be significantly lower. In a study conducted by Chung et al., in 2017, it was determined the participants who were the least influenced by health professionals in the decisions on vaccines were also the ones who had refused vaccinations. Moreover, the frequency at which parents who had refused vaccines had been influenced by the Internet and books were found to be significantly higher than other parents.^[18] This study also supports the results of this study.

Table 4. The sociodemographic and vaccine-related characteristics by parental allow to vaccinate their children

	Unvaccinated child			p
	No (n=349)	Yes (n=11)	Unknown (n=15)	
Age (year)	39.0 (10.0)	31.0 (10.0)	38.0 (13.0)	0.029*
Number of children	2.0 (0.0)	1.0 (2.0)	2.0 (1.0)	0.694*
Education status				
Literate	1 (0.3)	0 (0.0)	0 (0.0)	0.657 [†]
Primary School	49 (14.0)	0 (0.0)	3 (20.0)	
Secondary School	37 (10.6)	1 (9.1)	3 (20.0)	
High School	70 (20.1)	2 (18.2)	3 (20.0)	
University	192 (55.0)	8 (72.7)	6 (40.0)	
Income status				
Income lower than expenses	107 (30.7)	2 (18.2)	4 (26.7)	0.826 [†]
Income and expenses equal	183 (52.4)	6 (54.5)	9 (60.0)	
Income higher than expenses	59 (16.9)	3 (27.3)	2 (13.3)	
The house they live in owns to them				
No	108 (30.9)	5 (45.5)	7 (46.7)	0.313 [†]
Yes	241 (69.1)	6 (54.5)	8 (53.3)	
The place where they live				
Small town	37 (10.6)	2 (18.2)	1 (6.7)	0.885 [†]
Village	57 (16.3)	1 (9.1)	3 (20.0)	
City	255 (73.1)	8 (72.7)	11 (73.3)	
Own vaccination status				
Incomplete	15 (4.3)	2 (18.2)	1 (6.7)	0.146 [†]
Complete	257 (73.6)	5 (45.4)	11 (73.3)	
Does not know	77 (22.1)	4 (36.4)	3 (20.0)	
Recognize someone who has not vaccinated their children				
No	142 (40.7)	2 (18.2)	1 (6.7)	0.001 [†]
Yes	72 (20.6)	7 (63.6)	4 (26.6)	
Unknown	135 (38.7)	2 (18.2)	10 (66.7)	
Vaccine-related side effect				
None	255 (73.1)	3 (27.3)	11 (73.3)	0.005 [†]
Mild	93 (26.6)	7 (63.6)	4 (26.7)	
Severe	1 (0.3)	1 (9.1)	0 (0.0)	

The data are presented as median (interquartile range) and n (%).

*Mann Whitney U test, [†]Chi squared test.

Where all of the individuals known to the parents in this study had their children vaccinated, the vaccine hesitancy of these parents' scores in the WHO Vaccine Hesitancy Scale in Turkish was found to be significantly higher. This means that these parents have low vaccine hesitancy frequency. Moreover, the probability that a parent who did not allow at least one of their children to be given a full set of vaccines although these were included in the vaccination schedule knowing someone who did not have their children vaccinated is significantly higher. This is the only

parameter that has a significant result in both of the assessments conducted in this study. Similarly, vaccine hesitancy was also found to be significantly higher among the parents who knew individuals who had not had their children vaccinated, in the study conducted by Aslan et al.^[10] When this study is assessed together with other similar studies, the high level of influence had by the thoughts of acquaintances and the experiences of the people around them on parents is clear.^[19]

One of the limitations of this study is the fact that the data obtained from the parents through a questionnaire is dependent on the statements of the parents. There were also a considerable amount of responses such as, "I do not remember", and this may have prevented us from detecting significant relationships. While 54.9% of the parents in this study were university graduates, this is higher than the data shown in the Population and Health Study of Türkiye for 2018 and thus may have had an effect on the results of this study. The other limitations of this study are that it was not possible to obtain a normal distribution in many of the variables, the very low number of parents whose children had experienced severe side effects, and that the study was conducted only with parents who had consulted the Eskişehir Osmangazi University Family Medicine Polyclinic.

CONCLUSION

Vaccine hesitancy is increasing all over the world and assessing the risk factors associated with it may help to counteract vaccine hesitancy. There is a need for health professionals to provide the correct information in a timely manner, as the frequency of refusal of vaccinations was found to be high for parents who have experienced side effects in their children. Otherwise, when parents go to the Internet to do their own research, their vaccine hesitancy prevalence increases. The responsibility falling to health professionals on this matter is big because when health professionals do provide information to parents, the vaccine hesitancy prevalence of these parents becomes lower. In addition to this, by ensuring that these opportunities are also available in the small towns and villages of the rural areas, the increase in vaccine hesitancy in the small towns should be prevented.

Disclosures

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Ethics Committee Approval: Approval for this study was obtained from the Eskişehir Osmangazi University Non-Invasive Clinical Research Ethics Committee (Approval date: January 18, 2022, and approval number: 21). Parents were informed about the research at the polyclinic after the examination.

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