

Türk Ebeveynlerin Çocuklarına COVID-19 Aşısı Uygulanması ile İlgili Tutumlarının İncelenmesi

Turkish Parental Attitudes Towards COVID-19 Vaccines for Their Children

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ÖZ

Giriş: Hastalık Kontrol ve Önleme Merkezi (CDC), 6 ay ve üzerindeki çocukların COVID-19'a yönelik aşılmasını önermesine karşın istenen aşılanma oranına henüz ulaşamamıştır. Bu çalışmada, Türk ebeveynlerinin COVID-19 aşılarına yönelik kabul oranının ve "Modifiye Aşı Tereddütü Ölçeği (VHS)" kullanılarak ebeveynlerin aşı kabulünü etkileyen faktörlerin belirlenmesi amaçlanmıştır.

Yöntem: Beş puanlı Likert sorular içeren VHS'nin COVID-19 aşılarına yönelik uyarlanması ile 7 maddeden oluşan Modifiye-VHS anketi oluşturuldu. Modifiye-VHS ve demografik soruları içeren anket, ebeveynlere 2021 Eylül-2022 Temmuz tarihleri arasında uygulandı.

Bulgular: Çalışmaya 423 yanıt dahil edildi. Bunlardan, %42,3'ü (n=179) 16 yaş altındaki çocuklarını COVID-19'a karşı aşılamayı onaylarken, %8,5'i (n=36) kararsızdı ve %49,2'si (n=208) onaylamadı. COVID-19 aşılarını kabul etme oranı 35 yaş üzerindeki ebeveynler ile çocuğu 5 yaş üzerinde olan ebeveynlerde daha fazla idi ($p<0,01$, $p<0,01$). Vefat eden çocuk öyküsü bulunması, evde kronik hastalıklı birey varlığı, ev içinde COVID-19 geçiren birey bulunması (olumsuz etki) ve ebeveynin ve ev halkının COVID-19 aşılanma durumu, aşı kabulünü etkileyen diğer faktörlerdi ($p=0,047$, $p=0,048$, $p=0,043$, $p<0,001$, $p<0,001$). Modifiye-VHS ile ebeveynlerin çocuklarını COVID-19'a karşı aşılamayı kabul etme durumu arasında çok güçlü ve pozitif bir korelasyon bulundu ($r: 0,706$, $p<0,001$).

Sonuç: Bu çalışma ile Türk ebeveynlerin çocuklarına COVID-19 aşısı uygulanmasını kabul oranının düşük olduğu belirlenmiştir. Ebeveynlerin COVID-19 aşılarına yönelik tutumlarını etkileyen faktörler çalışmamızda incelenmiş ve ebeveynlerin COVID-19 aşı kararsızlığını belirlemek amacıyla Modifiye-VHS anketi kullanılabileceği gösterilmiştir.

Anahtar Kelimeler: aşı kararsızlığı, aşı kararsızlık ölçeği, aşı reddi, COVID-19 aşıları, ebeveynler

ABSTRACT

Objective: The Centers for Disease Control and Prevention (CDC) recommends vaccinating children aged 6 months and older against COVID-19, but the desired vaccination rate in children has not been achieved. We aimed to detect the parental acceptance rate of COVID-19 vaccines in Turkish parents and to identify the factors influencing parental acceptance by using a "modified Vaccine Hesitancy Scale (VHS)".

Method: A modified-VHS survey containing 7-item was prepared by adapting the "VHS 5-point Likert questions" to the COVID-19 vaccines. The questionnaire including modified-VHS and demographic questions was conducted with parents applied to pediatrics clinics between September 2021 and July 2022.

Results: A total of 423 answers were included in the study. Of these, 42.3% (n=179) approved of vaccinating their children under 16 years of age against COVID-19, 8.5% (n=36) were hesitant, and 49.2% (n=208) did not approve. Parents over 35 years old and parents with a child >5 years old were found more likely to accept COVID-19 vaccines ($p<0.01$, $p<0.01$). The history of a deceased child, the presence of chronic disease in the household, previous COVID-19 positivity in the household (negative effect), and the COVID-19 vaccination status of the parent and household were other factors ($p=0.047$, $p=0.048$, $p=0.043$, $p<0.001$, $p<0.001$). A very strong and positive correlation was found between our modified-VHS and parental acceptance of vaccinating their children against COVID-19 ($r: 0.706$, $p<0.001$).

Conclusion: The acceptance rate of COVID-19 vaccination for children by Turkish parents is low and the Modified-VHS questionnaire can be used to determine parental COVID-19 vaccine hesitancy.

Keywords: COVID-19 vaccines, parents, vaccination hesitancy, vaccine hesitancy scale, vaccination refusal

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INTRODUCTION

On May 5, 2023, the World Health Organization (WHO) downgraded the status of COVID-19 from a public health emergency of international concern to a recognized, yet persistent, global health challenge (1). Although the pandemic was over, this did not mean that the battle with COVID-19 had ended and the administration of COVID-19 vaccinations is one of the essential weapons in this war.

The global rollout of COVID-19 vaccines commenced in December 2020 for individuals 16 years and older. Subsequently, the eligibility criteria were progressively revised to encompass younger age groups: adolescents aged 12-15 years in May 2021, children aged 5-11 years in December 2021, and finally, children as young as 6 months old by July 2022 (2, 3).

The COVID-19 immunization in Türkiye started in January 2021 with the administration of CoronaVac® (inactive whole virion vaccine) to healthcare workers. The eligibility age was progressively lowered, commencing with citizens over 65. In April 2021, Pfizer®-BioNTech (BNT162b2 mRNA) vaccine was introduced alongside CoronaVac® for adults. In July 2021, the age for receiving the COVID-19 vaccine was lowered to 16 years; in August 2021, it was decreased to 15 years and 12 years for children with comorbidities; in September 2021, it was reduced to 12 years. TURKOVAC® (inactive whole virion vaccine) was first made available to adults in December 2021. Over 85% of individuals above 18 in October 2022 were double-vaccinated against COVID-19 (4).

The Centers for Disease Control and Prevention (CDC) recommends COVID-19 vaccination to all children, with the minimum age for eligibility being six months (5). The WHO classifies all adolescents as a high-priority group and children with severe obesity or significant comorbidities as a medium-priority group, indicating that COVID-19 immunization is a priority for these populations (6). Since September 2021, Türkiye has approved the COVID-19 vaccines Pfizer®/Biontech and CoronaVac® for those aged 12 and older. However, their use is not allowed in children under 12 years.

Understanding societal acceptance of COVID-19 vaccines is essential for effective vaccination campaigns that can curb the spread of the virus and minimize the possibility of new variants. Parents hold the primary responsibility for deciding on the immunizations of their children, and it is, therefore, essential to understand their knowledge and awareness of COVID-19 vaccines and the underlying causes of hesitancy or refusal of vaccination. In Türkiye, the population under the age of 18 years is substantial (26.5%), making it crucial to investigate parents' perspectives on COVID-19 vaccination (7).

Several vaccine hesitancy questionnaires have been developed to facilitate efficient communication of immunization concerns and to enhance immunization rates (8, 9). This study adapted the "Vaccine Hesitancy Scale (VHS)" questions to evaluate the views of parents on the COVID-19 vaccine (9).

To understand parental views on COVID-19 vaccines for their children, this research assessed factors that influence their decision to vaccinate.

MATERIALS AND METHODS

Study design

Between September 2021 and July 2022, face-to-face interviews were conducted with parents who applied to the pediatrics department and agreed to complete the questionnaire. A physician conducted the interviews, and the responses were recorded using Google Forms®.

This study recruited Turkish parents aged 18 and over who had at least one child under 18. Immigrant parents were excluded from this study. If a parent had multiple children, they answered questions based on their youngest child.

Questionnaire

The questionnaire was divided into parental and child demographics and a modified-VHS survey to assess views on COVID-19 immunization. The demographics of parents and children were collected to evaluate the characteristics of the study group. A modified-VHS survey containing seven items was prepared by adapting the "VHS 5-point Likert questions" to the COVID-19 vaccine (9). The items were as follows:

1. COVID-19 vaccines are important for my child's health.
2. COVID-19 vaccines are effective.
3. Vaccinating my child against COVID-19 is important for public health.
4. COVID-19 vaccines which are supplied by the government are beneficial.
5. Vaccinating for COVID-19 is a good way to protect my child from the illness.
6. I usually do whatever my doctor or allied health personnel suggest about COVID-19 vaccines for my children.
7. If my child had the COVID-19 vaccine, I would send her/him to the nursery/school with more confidence.

Each question used a five-point Likert scale, with 5 indicating strong agreement and 1 indicating strong disagreement.

Ethical approval

Ethical approval for this study was granted by the Local Ethics Committee (Approval number: 09.2021.1050).

Statistical analysis

The data was analyzed with SPSS® Statistics for Windows, Version 22.0. Frequencies and percentages were used to report categorical variables, while continuous variables were expressed as either mean \pm standard deviation or median and interquartile range (IQR), depending on their distribution. An independent sample t-test or Mann-Whitney U test was used to compare continuous variables based on their distribution. Pearson Chi-square test and Fisher's exact test were used to compare categorical variables considering the sample size. The threshold for statistical significance was established at $p < 0.05$.

Multinomial logistic regression analysis was conducted to estimate the

odds ratios of the likelihood of parents agreeing to immunize their children using all the statistically significant variables ($p < 0.05$) in the univariate analysis.

To understand the underlying structure of the survey, an Exploratory Factor Analysis (EFA) was performed. The Kaiser–Meyer–Olkin (KMO) measure confirmed a sufficient sample size for this analysis. (KMO = 0.90) Additionally, Bartlett's test of sphericity ($p < 0.01$) indicated strong correlations between survey items, suitable for EFA. Finally, the internal consistency of the survey was ensured with Cronbach's alpha coefficient (0.91).

RESULTS

Four hundred forty-five parents ($n=445$) completed the study questionnaires. However, 22 responses failed to meet the inclusion criteria. Among the remaining 423 parents, 330 (78.0%) were mothers and 93 (22.0%) were fathers.

The demographic characteristics of the participating parents and their children are detailed in Table 1. The median parental age was 35 years (IQR 25:31, IQR 75:41) and the median child age was 38 months (IQR 25:12.0, IQR 75:90.0). The number of children of the parents who completed the questionnaire ranged from 1 to 10; 173 (40.9%) had two children and 146 (34.5%) had one child. Sixty-four parents (15.1%) were related to their spouses.

Routine childhood vaccinations were completed in 97.4% ($n = 412$) of the children. 75.2% ($n=318$) of parents had all household members older than 16 years immunized against COVID-19. Of the parents, 42.3% ($n = 179$) were approved for vaccinating their children under 16 years of age against COVID-19, 8.5% ($n=36$) were hesitant to vaccinate, and 49.2% ($n=208$) did not approve of vaccination.

Of the 244 parents who accepted or hesitated to immunize their children against COVID-19, 82.8% ($n = 202$) preferred Pfizer®-BioNTech, 11.9% ($n = 29$) preferred TURKOVAC® and 5.3% ($n = 13$) preferred CoronaVac®.

Parents over 35 years of age were more likely to accept their children being vaccinated against COVID-19 than parents under 35 years of age ($p < 0.001$). Parents were more likely to accept vaccinating their children over 5 years old ($p < 0.001$). Other factors affecting acceptance of parental COVID-19 vaccine were a history of child loss, a household member with a chronic disease, previous COVID-19 positivity in the household (which had a negative effect), and the COVID-19 immunization status of the parent and household (Table 2) ($p=0.047$, $p=0.048$, $p=0.043$, $p < 0.001$, $p < 0.001$).

A multinomial logistic regression analysis was performed to determine the impact of these factors on COVID-19 vaccine acceptance. Parents who had been vaccinated against COVID-19 themselves were 14.6 times more likely to be hesitant to vaccinate their children against COVID-19 than parents who did not accept their children being vaccinated against COVID-19 (Odds ratio (OR)= 14.64, 95% confidence interval (CI)=1.93-110.99, $p=0.009$). Parents who had previous COVID-19 positivity in the household were 37.1% less likely to be hesitant to vaccinate their children for COVID-19 (OR= 0.371, 95% CI=0.17-0.79, $p=0.010$). (Table 3)

Parents who had someone with a chronic disease in the household were 1.68 times more likely to approve COVID-19 vaccines for their children than parents who did not have someone with a chronic disease in the household (OR= 1.68, 95% CI=1.06-2.64, $p=0.025$). Parents who had COVID-19 vaccines for themselves were 9.22 times more likely to approve COVID-19 vaccines for their children than parents who did not have COVID-19 vaccines for themselves (OR= 9.22 95% CI=4.14-20.52, $p<0.001$). Parents with children over the age of 5 were 5.55 times more likely to approve COVID-19 vaccines for their children than parents with children under the age of 5 (OR=5.55, 95% CI=1.00-30.71, $p=0.049$). Parents who had previous COVID-19 positivity in the household were 59% less likely to approve of COVID-19 vaccines for their children than parents who did not have previous COVID-19 positivity in the household (OR=0.59, 95% CI= 0.36-0.95, $p=0.033$). (Table 3)

Likert-scale questions were utilized to assess parental attitudes regarding COVID-19 vaccination for their children. The results of these questions are presented in Figure 1.

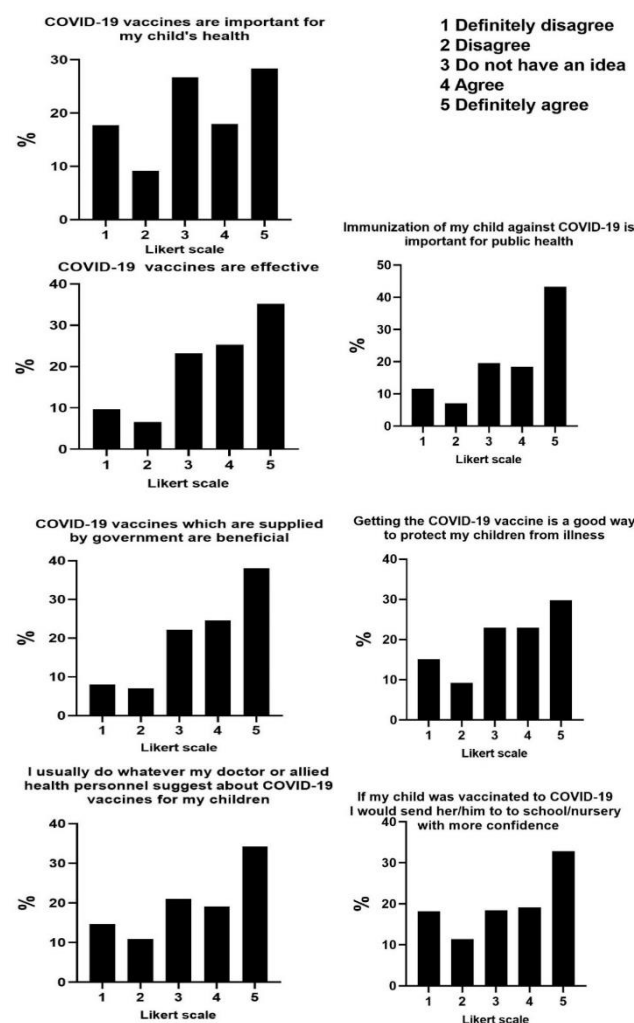


Figure 1. Likert-scale Questionnaire Answers for Parental Attitudes Among COVID-19 Vaccines

A very strong and positive correlation was identified between the 7-item scale and parental acceptance of vaccinating their children for COVID-19 ($r=0.706$, $p<0.001$). Higher scores on the questionnaire were detected if there was no history of COVID-19 positivity in the household

($p=0.006$), no deaths from COVID-19 in the household ($p=0.002$), the parent had been COVID-19 vaccinated ($p=0.001$), the parent was over 35 years old ($p=0.011$), ($p=0.011$), and the child was over 5 years old ($p=0.005$).

Table 1. Demographic Information of Parents and Children			
	Median	IQR 25- IQR 75	Min-Max
Age of parents (years)	35	31-41	19-57
Age of children (months)	38	12-90	1-208
Number of children in the family	2	1-2	1-10
Number of people in the same house	4	3-5	2-11
	n (%)		
Gender of parents			
Female	330 (93.0)		
Male	93 (22.0)		
Consanguinity between parents			
Yes	64 (15.1)		
No	359 (84.9)		
Place of residence			
Istanbul	312 (73.8)		
Other	111 (26.2)		
Education status			
Illiterate	14 (3.3)		
Primary school	124 (29.3)		
High school	75 (17.7)		
University	141 (33.3)		
Master or above	69 (16.3)		
Household income			
< 400 USD	106 (25.1)		
400-800 USD	147 (34.8)		
800-1600 USD	97 (22.9)		
>1600 USD	73 (17.3)		
History of chronic disease in at least one household member			
Yes	171 (40.4)		
No	252 (59.6)		
History of child loss			
Yes	21 (5.0)		
No	402 (95.0)		
History of COVID-19 positivity in the household			
Yes	295 (69.7)		
No	128 (30.3)		
History of death in the family members due to COVID-19			
Yes	18 (4.3)		
No	405 (95.7)		
Source of information on COVID-19 vaccines			
Healthcare personnel	182 (43.0)		
Friends/family members	19 (4.5)		
Television	118 (27.9)		
Internet/ social media	104 (24.6)		

		COVID-19 Vaccine Acceptance					
		No		Hesitant		Yes	
		n	%	n	%	n	%
Gender of parent	Female	161	(77.4)	27	(75.0)	142	(79.3)
	Male	47	(22.6)	9	(25.0)	37	(20.7)
Age of parent	19-35 years	128	(61.5)	21	(58.3)	72	(40.2)
	36-57 years	80	(38.5)	15	(41.7)	107	(59.8)
Age of child	< 5 years	147	(70.7)	24	(66.7)	94	(52.5)
	≥ 5 years	61	(29.3)	12	(30.3)	85	(47.5)
Place of residence	Istanbul	153	(73.6)	31	(86.1)	128	(71.5)
	Other	55	(26.4)	5	(23.9)	51	(28.5)
Education status	Illiterate	4	(1.9)	2	(5.6)	8	(4.5)
	Primary school	64	(30.8)	8	(22.2)	52	(29.1)
	High school	46	(22.1)	7	(19.4)	22	(12.3)
	University	67	(32.2)	11	(30.6)	63	(35.2)
	Master or above	27	(13.0)	8	(22.2)	34	(19.0)
Household income	< 400 USD	48	(23.1)	10	(27.8)	48	(26.8)
	400-800 USD	87	(41.8)	10	(27.8)	50	(27.9)
	800-1600 USD	46	(22.1)	8	(22.2)	43	(24.0)
	>1600 USD	27	(13.0)	8	(22.2)	38	(21.2)
Consanguinity between parents	Yes	31	(14.9)	3	(8.3)	30	(16.8)
	No	177	(85.1)	33	(91.7)	149	(83.2)
History of child loss	Yes	7	(3.4)	0	(0)	14	(7.8)
	No	201	(96.6)	36	(100)	165	(92.2)
Presence of chronic disease in household	Yes	72	(34.6)	15	(41.7)	84	(46.9)
	No	136	(65.4)	21	(58.3)	95	(53.1)
History of COVID-19 positivity in the household	Yes	155	(74.5)	20	(55.6)	120	(67.0)
	No	53	(25.5)	16	(44.4)	59	(33.0)
History of death in the family members due to COVID-19	Yes	13	(6.3)	0	(0)	5	(2.8)
	No	195	(93.4)	36	(100.0)	74	(97.2)
Immunization with childhood vaccines	All completed	201	(96.6)	36	(100.0)	175	(97.8)
	Not completed	7	(3.2)	0	(0)	4	(2.2)
Source of information on COVID-19 vaccines	Healthcare personnel	75	(36.1)	19	(52.8)	88	(49.2)
	Friends/family members	11	(5.3)	1	(2.8)	7	(3.9)
	Television	64	(30.8)	8	(22.2)	46	(25.7)
	Internet/ social media	58	(27.9)	8	(22.2)	38	(21.2)
COVID-19 vaccine situation of responder	Vaccinated	151	(72.6)	35	(97.2)	171	(95.5)
	Not vaccinated	57	(27.4)	1	(2.8)	8	(4.5)
Household COVID-19 vaccine situation	All > 16 y vaccinated	125	(60.1)	30	(83.3)	163	(91.1)
	Partly vaccinated	52	(24.5)	5	(13.9)	15	(8.4)
	None vaccinated	32	(15.4)	1	(2.8)	1	(0.6)

Pearson Chi-square test. *p value <0.05

Table 3. Predictors of COVID-19 Vaccine Acceptance and Hesitancy Identified by Multinomial Logistic Regression Analysis

		Odds ratio	%95 Confidence Interval	p value
Hesitant	History of COVID-19 positivity in the household	0.37	0.174-0.790	0.010
	COVID-19 vaccine situation of responder	14.64	1.933-110.992	0.009
Accepted	Presence of chronic disease in household	1.68	1.068-2.648	0.025
	History of COVID-19 positivity in the household	0.59	0.365-0.958	0.033
	COVID-19 vaccine situation of responder	9.22	4.149-20.523	<0.001
	Child age	5.55	1.004-30.719	0.049
*Reference category=Did not accept (Among the variables, only those with p < 0.05 are given in the table.)				

DISCUSSION

The WHO underlines the importance of including COVID-19 vaccines in daily practice and recommends them to all adolescents as a high-priority group and children with severe obesity or significant comorbidities as a medium-priority group (6). The CDC recommends COVID-19 immunization to all children, with the minimum age for eligibility being six months (5). Despite recommendations to immunize children for COVID-19, a low percentage (42.3%) of Turkish parents in our study agreed on the vaccine for their children. An additional 8.5% expressed hesitation, and 49.2% refused vaccination. In the literature, the COVID-19 vaccine acceptance rate of parents for their children varies between countries and according to the period in which the study was conducted. A United States-based pre-vaccination study reported a 65% willingness among parents to immunize their children for COVID-19. Conversely, Brazilian research implemented during a period of adult-only vaccination identified a significantly higher acceptance rate of 91% for childhood COVID-19 immunization (10, 11). A comprehensive review of the existing literature, analyzing 28 studies on parental COVID-19 vaccine attitudes, yielded an average acceptance rate of 55.81% (12). Our study was conducted in the post-vaccine period when the anxiety of contracting or dying from COVID-19 was largely mitigated.

Vaccine rejection and hesitation are growing worldwide (13). However, it is well established that Turkish parents generally follow the recommended national immunization program (NIP) (14-16). On the other hand, a large number of Syrian and Afghan immigrants have settled in Türkiye, especially since the 2010s (17). One study found that the rate of never-vaccinated Syrian refugee children (8.0%) was more than twice that of unvaccinated Turkish children (3.4%) (18). Our study included only Turkish parents, and we found that their NIP compliance rate was 97.4%.

Pfizer®-BioNTech and CoronaVac® vaccines were available for individuals over 16 years of age throughout the study period and for most of the study period in children aged 12 years and older. Parents were asked which of the three COVID-19 vaccines they preferred if it was possible to administer them to their child. Of the parents, 82.8 % preferred Pfizer®-BioNTech, 11.9% preferred TURKOVAC®, and 5.3% preferred CoronaVac®. A pre-vaccine study conducted on Turkish parents found that they preferred domestic COVID-19 vaccines for their children (19). However, most parents preferred Pfizer®-BioNTech in our study. This result suggests that foreign vaccines have built public confidence in the

spread of COVID-19 vaccines.

A recent study from Istanbul, Türkiye examined parental hesitancy for COVID-19 vaccine by children's age and found that vaccine hesitancy rates were 78.9%, 73.6%, and 47.3% for the 0–6, 6–12, and 12–18 age groups, respectively (20). We detected a similar pattern in our study. Parents with younger children (under five) showed a rate with higher rejection for COVID-19 vaccines than the parents of older children. According to a meta-analysis of 98 articles from 69 countries on parental COVID-19 vaccine acceptance, parents reported more acceptance if their children were older (21). This meta-analysis also highlights the relationship between parental age and vaccine acceptance. Older parents generally demonstrated more vaccine acceptance, while conflicting findings were found regarding older parents' higher vaccination hesitancy (21). We found that parents over the age of 35 years were more likely to accept COVID-19 vaccines for their children than parents aged 35 and younger.

Not surprisingly, parents' acceptance of the COVID-19 vaccine for their children increased when parents or households were immunized for COVID-19. The data is consistent with those reported in the existing literature (21). The influence of chronic disease history in households on parental acceptance of COVID-19 vaccine is contradictory with studies finding positive, negative, or ineffective impacts (12, 21). We found that parents who have someone with a chronic disease in their households were more likely to accept the COVID-19 immunization for their children.

We found that parental acceptance of the COVID-19 vaccine increased among parents with a history of a deceased child. This finding is consistent with the long-recognized phenomenon of parental overprotection of surviving children after their death (22). However, the history of death due to COVID-19 among family members did not affect parental acceptance of the COVID-19 vaccine in our study. This finding is consistent with that of two previous studies conducted in Thailand and Türkiye (23, 24).

We showed that a history of COVID-19 positivity within the household decreases parental COVID-19 vaccine acceptance. The history of COVID-19 infection among household members did not show consistent results in the literature. While some studies established a positive association, others concluded that there was either a negative or no association (21, 25).

Several studies have used scales to evaluate parental acceptance of COVID-19 vaccines (11, 26). Our study employed a modified 7-item

survey adapted from the VHS for COVID-19 and we found that this survey demonstrated a strong correlation with parental acceptance of the COVID-19 vaccine. Higher survey scores were observed in households with no history of COVID-19 positivity, no deaths from COVID-19, parents who had been vaccinated against COVID-19, parents over the age of 35, and children over the age of 5.

To combat vaccine hesitancy and rejection, it is essential to elucidate the underlying reasons, disseminate accurate information about vaccines, and implement targeted communication strategies alongside interventions to mitigate the spread of misinformation (27). Our study revealed that approximately 20% of parents consistently selected the "3 Do not have any idea" option regarding COVID-19 vaccines across all survey questions. This finding highlights the significant knowledge gap among parents concerning COVID-19 vaccines and underscores the importance of information dissemination and improved communication strategies.

Several limitations inherent to the study design should be acknowledged. First, the sample size was relatively modest, potentially limiting the generalizability of the findings to a broader Turkish population. Second, the single-center design restricts the external validity of the results, meaning the findings may not apply to parents in other geographic locations within Türkiye. Additionally, the use of face-to-face interviews may have influenced parental responses, potentially introducing response bias.

We recommend prioritizing efforts to improve vaccine acceptance among hesitant parents by addressing their concerns and understanding the reasons behind their hesitancy. Policymakers should ensure the availability of clear, evidence-based information, while pediatricians and other healthcare professionals should actively advocate for and recommend COVID-19 vaccination to the children.

CONCLUSIONS

Our research sheds light on the factors influencing Turkish parents' decisions regarding COVID-19 vaccination for their children. The results suggest a need for further efforts to address parental concerns and increase vaccine acceptance.

Ethics Committee Approval: Ethical approval for this study was granted by the Local Ethics Committee (Approval number: 09.2021.1050).

Authors' contributions: ZE, SE, EK. Design: ZE, SE, ÖG. Supervision: EK. Resources: ZE, SE, ÖG, MAY, MCŞ, SAT, SY, PCE, ADİ. Materials: ZE, SE, ÖG, MAY, MCŞ. Data collection and/or processing: ZE, SE, ÖG, MAY, MCŞ, SAT, SY, PCE, ADİ. Analysis and/or interpretation: ZE, SAT, SY, PCE, ADİ. Literature search: ZE, SE, ÖG. Writing manuscript: ZE, EK. Critical review: ZE, SE, ÖG, MAY, MCŞ, SAT, SY, PCE, ADİ, EK.

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Informed Consent: Informed consent was obtained from all patients in the study.

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