



# Evaluation of the Thoughts and Attitudes About COVID-19 Vaccine of Families of Children with Type 1 Diabetes Mellitus

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## Abstract

**Objectives:** The most effective method of protection against infectious diseases is vaccination. Diabetic individuals are more susceptible to infections. Vaccination has a critical importance for individuals with Type 1 diabetes. In light of this information; to evaluate the thoughts and attitudes of families about the COVID-19 vaccine with children having Type 1 diabetes; it is aimed to evaluate whether children between the ages of 12–18 years and being defined for COVID-19 vaccine were vaccinated and if not, the reason for this unvaccinated situation.

**Methods:** A questionnaire form created by the researcher by reviewing the literature questioned to 85 parents having Type 1 diabetic children between the ages of 12 and 18, being defined for the COVID-19 vaccine who applied to the endocrinology outpatient clinic, and accordingly, the study data were evaluated using descriptive statistical methods.

**Results:** The rate of parents who were worried that their child with diabetes would get COVID-19 infection in the pandemic was 81.2%. In the evaluation of the COVID-19 vaccine, 82.4% of the parents stated that the vaccine was protective, while 17.6% thought that the vaccine was not protective. Thirty out of 85 parents stated that they did not vaccinate their children with the COVID-19 vaccine and defined the reasons for not vaccinating as their not finding the vaccine safe, being undecided, not preferring the vaccine, hesitating due to the age of the child, and the fact that their child had COVID-19 infection beforehand. About 43.5% of these 85 parents, who participated in our study, stated that they had anxiety about vaccination.

**Conclusion:** It has been concluded that although parents are afraid of COVID-19 infection, the vaccination rates of their children with Type 1 diabetes are low due to their concerns about the vaccine. Our study results show that the COVID-19 vaccine is a new vaccine, not been applied to children before, and the possibility of side effects after vaccination causes anxiety and hesitation, especially in parents of children with chronic diseases.

**Keywords:** COVID-19 vaccine, parents attitude, Type 1 diabetes.

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The Coronavirus Disease 2019 (COVID-19) pandemic, which first emerged in the People's Republic of China in late 2019, is an infectious disease that causes a range of human respiratory infections, ranging from mild colds to severe respiratory distress syndrome. The World Health Organization declared the COVID-19 epidemic as a pandemic in March 2020.<sup>[1,2]</sup>

Since the first spread of the pandemic, the importance of personal protective measures (e.g., home quarantine, wearing masks, and disinfecting hands) has always been emphasized. However, these physical protective measures are not enough to eliminate the virus, besides it is not possible for the public to comply with protective measures for many years.<sup>[3]</sup> Our main aim should be to not get sick. Therefore,

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the most effective method of protection against infectious diseases is vaccination. The main goal of vaccination is to prevent severe disease and maintain general health.<sup>[4]</sup>

Diabetes is an extremely serious and chronic disease that is increasing worldwide. The leukocyte function of people with diabetes has been impaired due to the dysfunction of glucose. This makes them more susceptible to infections. The more severe course of infections in diabetic individuals increases the risk of mortality and morbidity. Therefore, vaccination has a critical importance for individuals with Type 1 diabetes.<sup>[5]</sup>

In our country, the vaccination for children over 12 years of age with chronic diseases started on August 18, 2021.<sup>[6]</sup> Considering the availability of COVID-19 vaccines for children with Type 1 diabetes and the dependence of children on parents in this regard; it is very important to understand the thoughts of parents in this population about the vaccination.<sup>[7]</sup> In our study, to evaluate the thoughts and attitudes against the COVID-19 vaccine of the families having children with Type 1 diabetes; it has been aimed to evaluate whether children between the ages of 12–18 years and who are assigned with COVID-19 vaccine are vaccinated and if not, the reason for this.

## Materials and Methods

This research has been conducted in accordance with descriptive and observational research principles.

This research was conducted on the parents of children aged between 12 and 18 years with Type 1 diabetes, defined for COVID-19 vaccine who applied to the Clinic of Pediatric Endocrinology between the dates of January and June 2022.

The research was explained by face-to-face interview technique to 85 parents when they came to the hospital.

These parents have children between the ages of 12 and 18 with Type 1 diabetes and are being defined for COVID-19 vaccine when applied to the Clinic of Pediatric Endocrinology between the dates of January and June 2022 and who agreed to participate in the study. Their consents were obtained and survey questions were asked to them. The survey included questions pertaining to both the mother and father. Each survey was answered by a single parent. The questionnaire conducted with the parents is shown in Table 1.

As a data collection method, a survey form developed by the researcher after reviewing the literature was used (Table 1). The survey consists of 30 questions and expert opinion was obtained for the suitability of the survey. The

demographic data, laboratory findings, data on COVID-19, number of visits for check-ups, insulin applications and blood glucose monitoring at home, vaccination status of the child, thoughts, and concerns about vaccination were tried to be determined through the applied survey and information obtained through the system.

After the permission numbered 2021-10-22T09\_24\_41 from the Scientific Research Platform of the Ministry of Health of the Republic of Turkey, the necessary ethics committee approval was obtained from the Clinical Research Ethics Committee of University of Health Sciences Ankara Dr. Sami Ulus Obstetrics and Gynecology, Pediatrics Training and Research Hospital with the protocol number E-21/12-250 dated December 01, 2021. The participants were included in the research by reading and approving the informed consent form about the content and confidentiality principles of the research. All principles of the Declaration of Helsinki were followed throughout the research.

## Statistical Analysis

IBM SPSS Statistics 22 (International Business Machines Statistical Package for the Social Sciences, Armonk, New York, ABD) program was used for the statistical analysis of the research. The descriptive statistical methods (average, standard deviation, and frequency) were used to evaluate the research data.

## Results

In our study, a questionnaire was conducted for the parents of 85 children with Type 1 diabetes and between the ages of 12 and 18 years. The demographic and clinical characteristics of children with Type 1 diabetes with an age average of  $15.14 \pm 1.73$  years and diabetes duration average of  $5.07 \pm 3.87$  years are shown in Table 2.

The questionnaire was answered by 62 (73%) mothers and 23 (27%) fathers. Both mother and father data were collected in the questionnaire. Demographic data of the mother and father are shown in Table 3.

It was determined that 78 (91.8%) of the parents who answered the survey knew what chronic disease meant, 81 (95.3%) knew that Type 1 diabetes was a chronic disease and 80 (94.1%) knew that their child was in the risk group in the pandemic. The rate of parents who were worried that their children with diabetes would get COVID-19 infection during the pandemic was 81.2%. As the reason for this anxiety, 61.2% of the parents stated that they thought that their children would survive the disease severely, and 20% stated that they were worried because they thought that their child would not survive the disease (Fig. 1).

**Table 1.** Evaluation of the thoughts and attitudes about the COVID-19 vaccine of the families having children with Type 1 diabetes

1. Name and Surname .....
  2. Age.....
  3. City.....
  4. Date of Diabetes Diagnosis.....
  5. Which school does he/she go to?  
\*Secondary School \*High School
  6. Mother's education level  
\*Elementary-Secondary School \*High School \*Bachelor's degree
  7. Mother's occupation.....
  8. Father's education level  
\*Elementary-Secondary School \*High School \*Bachelor's degree
  9. Father's occupation.....
  10. Family's income level  
\*Minimum wage \*Above minimum wage
  11. Do you know the meaning of chronic disease?  
\*Yes \*No
  12. Do you know that the type-1 diabetes is a chronic disease?  
\*Yes \*No
  13. Do you think that children with type-1 diabetes are within the risk group during the pandemic?  
\*Yes \*No
  14. Do you experience any anxiety that my child will catch COVID-19 during the pandemic period?  
\*Yes \*No
- If your answer is "yes";
15. What is the reason for your anxiety?  
\*Thinking that my child will have a severe infection.  
\*Thinking that my child will not survive the infection because she/he has a chronic disease.  
\*Other.....
  16. Did your child with diabetes have COVID-19?  
\*Yes \*No
- If your answer is "yes", please reply on 17-18-19-20-21. questions:
17. How did the COVID-19 process pass?  
\*Passed without any symptoms  
\*Passed with mild symptoms  
\*Passed with severe symptoms
  18. Were there any changes in the blood glucose during COVID-19 infection?  
\* No change  
\* Blood glucose remained as high  
\* Blood glucose remained as low
  19. Were there any changes in the requirement of insulin during COVID-19 infection?  
\*No change  
\*Insulin requirement increased  
\*Insulin requirement decreased
  20. Were there any changes in her/his diet during COVID-19 infection?  
\*No change  
\*Her/his appetite increased  
\*Her/his appetite was lost.
  21. Do you think that the COVID-19 vaccine is protective?  
\*Yes \*No
  22. Do you have any concerns about the COVID-19 vaccine?  
\*Yes Please specify:.....  
\* No

**Table 1. Cont.**

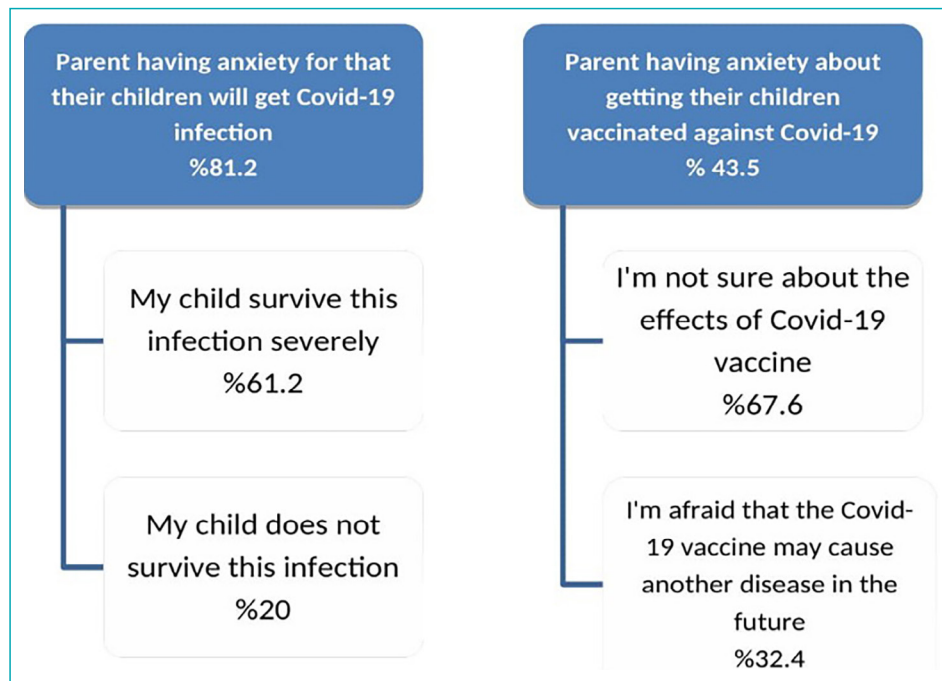
- 23. Whose approval would you get before vaccination feels you comfortable?
  - \* The unit where my child is being followed up.
  - \* My family
  - \* Circle of friends
  - \* Other.....
- 24. Did you consult anyone/anywhere before vaccinating your child?
  - \* Yes Please specify.....
  - \* No
- 25. Did you vaccinate your child with diabetes for COVID-19?
  - \* Yes \*No
- If your answer is "No";
- 26. Please specify your reason for not vaccinating.....
- 27. Did anyone in your family have COVID-19?
  - \*Yes Degree:.....
  - \* No
- 28. Did anyone in your family die due to the COVID-19?
  - \* Yes Degree.....
  - \* No
- 29. Did the mother of the child with diabetes be vaccinated for COVID-19?
  - \*Yes \*No Please specify the reason:.....
- 30. Did the father of the child with diabetes be vaccinated for COVID-19?
  - \*Yes \*No Please specify the reason:.....

**Table 2. Demographic and clinical characteristics of children with type 1 diabetes (n=85)**

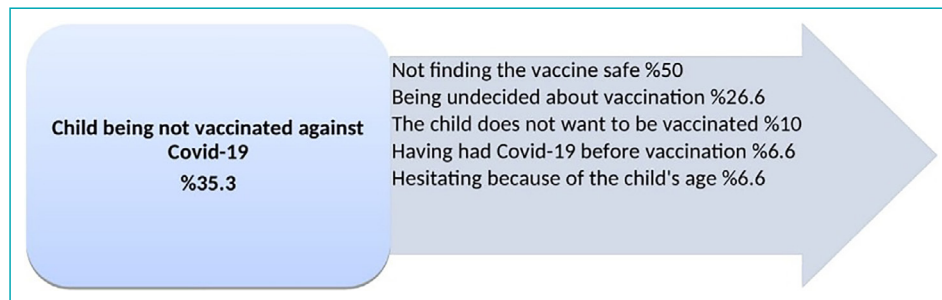
	n	%
Age (year)	15.14±1.73	
Gender		
Male	44	51.8
Female	41	48.2
Diabetes duration (year)	5.07±3.87	
Clinical presentation in diagnosis		
Hyperglycemia	22	25.9
Ketosis	17	20
Diabetic ketoacidosis	46	54.1
Additional chronic disease		
Hypothyroidism	12	14.1
Celiac	4	4.7
Hashimoto's thyroiditis and celiac	3	3.5
Vitiligo	1	1.2
Graves	1	1.2
Hearing loss	1	1.2
Epilepsy	1	1.2
Number of Check-up in the past 1 year	4.35±2.05	
HbA1c Average in the past 1 year	7.98±2.09	
HbA1c: Glycated hemoglobin, A1c.		

**Table 3. Demographic characteristics of the parents participating in the survey (n=170)**

	n	%
Residence city of family		
Ankara	67	78.8
Other cities	18	21.2
Family's income level		
Minimum wage	38	44.7
Above minimum wage	47	55.3
Mother's education level		
Elementary-secondary school	54	62.5
High school	21	24.7
Bachelor's degree	10	11.8
Mother's occupation		
Housewife	70	82.4
Public employee	6	7.1
Private sector employee	9	10.6
Father's education level		
Elementary-secondary school	43	50.6
High school	20	23.5
Bachelor's degree	22	25.9
Father's occupation		
Public employee	49	57.6
Tradesmen	34	40.0
Farmer	2	2.3



**Figure 1.** Concerns of the parents having children with type 1 diabetes about COVID-19 infection and vaccine.



**Figure 2.** Rate of children with type 1 diabetes who have not been vaccinated against COVID-19 and its reasons.

Fifteen children (17.6%) of the ones with diabetes had COVID-19 infection before admission (3 [20%] without symptoms, 10 [66.7%] with mild symptoms, 2 [13.3%] with severe symptoms). During COVID-19 infection, the blood glucose levels of 8 (53.3%) patients/children progressed highly, while there were no changes in blood glucose levels of 7 (46.7%) patients/children. Fourteen parents (93.3%) of 15 ones whose children had COVID-19 infection stated that they managed this process well. It was determined that 11 children of 15 ones who had COVID-19 infection were vaccinated with COVID-19 while four children were not.

In the evaluation of the COVID-19 vaccine, 70 (82.4%) of the parents stated that the vaccine was protective, while 15 (17.6%) stated that they thought that the vaccine was not protective. At the same time, 70 (82.4%) of the parents stated that they would be relieved to

get approval for the vaccine from the unit where the diabetes of their children was followed up. There were 55 parents (64.7%) who re-ceived the COVID-19 vaccine for their children with Type 1 diabetes and 34 (61.8%) of them received counseling about the vaccine (27 (79.4%) from the doctor, 6 (17.6%) from the diabetes education nurse, 1 (2.9%) from other families).

It was learned that the mothers and/or fathers of 88.2% (150 parents) of 85 children with diabetes were vaccinated. The reasons for not being vaccinated of the parents (20 parents) who were not vaccinated with the COVID-19 vaccine, were not finding the vaccine safe (16 parents), thinking that it would cause another disease (two parents), thinking that it was not necessary because they had COVID-19 infection before (one parent), and fear of vaccination because of drug allergy (one parent).

Thirty parents of 85 ones who answered the survey stated that they did not vaccinate their children against COVID-19. When the parents were asked about the reasons for not vaccinating their children, they answered these questions due to not finding the vaccine safe (15 parents), to be undecided (eight parents), not desiring the vaccine (three parents), hesitating because of the children ages (two parents), and have kept COVID-19 infection in the past (two parents) (Fig. 2).

Thirty-seven parents (43.5%) (28 mothers, 9 fathers) of 85 ones stated that they had doubts about the vaccine. The reasons for these doubts were described by 25 parents (67.6%) as uncertainty about the effect of the vaccine and by 12 parents (32.4%) as fear that it might cause another disease in the future. It was found that 17 (45.9%) of the 37 parents who had doubts about the vaccine had their child vaccinated with the COVID-19 vaccine despite having anxiety (Fig. 1).

## Discussion

This study aimed to evaluate the thoughts and attitudes about the COVID-19 vaccine of the families having children with Type 1 diabetes, whether the children with Type 1 diabetes who were defined with the COVID-19 vaccine were vaccinated and if not, the reason for this; it was determined that the parents commonly thought that the vaccine was protective (82.4%). However, 43.5% of the families had concerns about the vaccine. The reasons for not getting vaccinated of the parents (20 people) who did not get COVID-19 vaccine were sourced from the facts that it was not found the vaccine as safe (80%), thinking that it would cause another disease (10%), thinking that it was not necessary because they had COVID-19 infection beforehand (5%), and the fear of getting vaccinated because of drug allergy (5%).

In the study conducted in 2021 by Yiğit et al.<sup>[8]</sup> which aimed to evaluate the refusal of the COVID-19 vaccine in the parents, the participants who did not want to receive a domestic or foreign COVID-19 vaccine gave the following reasons for the refusal; avoiding from possible vaccine side effects (40.4%), not knowing the exact effectiveness of the vaccine (38.3%), not trusting the vaccines coming from abroad (29.4%), concerns about the excipients in the vaccine (22.7%), not believing in the effectiveness of vaccines (9.3%), not feeling fear or anxiety about COVID-19 infection (6.8%), not trusting the domestic vaccines (22, 7), being against the use of vaccines (5.3%), thinking that they would never get COVID-19 again (3%), religious reasons (2.1%), believing that the virus would mutate and the vaccine would be ineffective (1.2%), distrust in vaccine developing companies (2.1%), and thinking that vaccines may contain microchips (0.2%).

In a study conducted in 2021 with 1100 participants in Japan, which investigated the hesitancy of the parents

having their children vaccinated against COVID-19, the reasons for their uncertainty about the vaccination were found as the fact that the vaccines had side effects (84.9%), the uncertainty in vaccine safety (54.7%), and the lack of confidence in the effectiveness of the vaccine (25,7%).<sup>[9]</sup>

In a study conducted by Yılmaz and Şahin in 2021, in which they investigated the wishes and attitudes against the COVID-19 vaccine; it was found that the rate of the parents who hesitated to have their children vaccinated against COVID-19 was 35.6% and the rate of those who refused the vaccination was 36.3%. The concerns about the safety and side effects (76.9%) and the thought that the vaccine would be ineffective due to the mutations (36.7%) were found to be the main reasons for their reluctance to have their children vaccinated against COVID-19.<sup>[10]</sup>

In the study conducted by Akarsu et al.<sup>[11]</sup> in 2021, which aimed to determine the thoughts and attitudes of the public toward the COVID-19 vaccine for the future; 11.9% of the parents stated that they would not have their children vaccinated against COVID-19 because they were concerned about the side effects and 10.3% of the parents gave the same statement due the different reason that they did not find it reliable.

In the scoping review, which aimed to clarify the attitudes of the public toward the COVID-19 vaccine for children and adolescents and the factors affecting these attitudes, also included 34 studies; as a common result of the studies, it was determined that the willingness of the public to vaccinate children was not high, and the main reasons affecting the vaccination were their concerns about the safety and effectiveness of the vaccine and its possible side effects. In the studies, it was determined that although the individuals were encouraged to be vaccinated against COVID-19 with mandatory and free policies, most people hesitated to be vaccinated due to its side effects.<sup>[3]</sup>

In a study including 226 parents in South Korea investigating the acceptability of the COVID-19 vaccine for their children by parents and the factors affecting it; it was found according to the parents' responses that confidence in the information about COVID-19 vaccines was low (35.0%) and 70% of the parents had concerns about the vaccine safety. The main reason for these concerns was found with a rate of 84% that it was related to the adverse events that could develop after the vaccination.<sup>[12]</sup> In our study, the main reasons for parents' concerns about vaccinating their children were found as the fact that they were not be sure whether the vaccine would be effective (67.6%) and their thought that the vaccine would cause another disease in the future (32.4%).

The fact that the COVID-19 vaccine is a new vaccine, that it has not been applied to children before, and the

possibility of its side effects after vaccination causes anxiety and hesitation, especially among parents having children with chronic diseases.<sup>[13]</sup> This hesitation about vaccination leads to non-compliance with the vaccination campaign and results that the virus which could be the end of the pandemic has infected more people including children. According to an online survey conducted in Poland, the materials prepared by experts, the television, the press, and scientific literature were cited as the most common sources receiving information about COVID-19 vaccines by the respondents<sup>[14]</sup> It has also been reported that the recommendations coming from peers and healthcare providers increase the desire for vaccination.<sup>[15]</sup> In our study, it has been found that 79.4% of 55 parents who had their child vaccinated against COVID-19 decided to have their children vaccinated after receiving the information about the vaccine from their doctor, 17.6% from their nurse, and 2.9% from other families. In addition, 70 parents of 85 ones who participated in our study stated that getting approval from the unit where their children were followed up before the COVID-19 vaccine would make them feel comfortable. Therefore, to combat the increasing misinformation; reliable scientific data should be shared, accurate information about the COVID-19 vaccine should be provided to all segments of society, publications explaining the benefits of the vaccine should be increased on television and the internet, the advertising campaigns with more accurate information should be created, the healthcare professionals should be considered the most reliable source of the information about the COVID-19 vaccine and more support should be received from them in vaccination campaigns. It is also proven by studies that the end of the infection chain of COVID-19 and the welfare and health of the entire population worldwide could be improved in this way.<sup>[16]</sup>

The limitation of the research is that the survey could be conducted only to the people who applied to the Clinic of Pediatric Endocrinology within a certain time period of time.

## Conclusion

In our study, it was determined that 81.2% of 85 parents having children with Type 1 diabetes were concerned that their children might get COVID-19 infection, and 43.5% were concerned about getting the COVID-19 vaccine. Despite these concerns, 55 (64.7%) of 85 parents vaccinated their children against COVID-19, while 30 parents did not vaccinate. It was determined that 61.8% of the parents who were vaccinated received counseling from different sources about the vaccine. It was determined that 50% of 30 parents did not vaccinate because they did not find the vaccine safe.

## Disclosures

**Ethics Committee Approval:** The study was approved by the University of Health Sciences, Ankara Dr. Sami Ulus Obstetrics and Gynecology, Pediatrics Training and Research Hospital Clinical Research Ethics Committee (no: E-21/12-250, date: 01/12/2021).

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