Trust, distrust and skepticism: Parent’s perspective on COVID-19 prevention and vaccination in children aged 0-5 years

Taylan Çelik1, Buket Başaran Tarhan2

1Çanakkale Onsekiz Mart University, Faculty of Medicine, Department of Pediatrics, Division of Pediatric Infectious Disease, Çanakkale, Türkiye
2Çanakkale Onsekiz Mart University, Faculty of Medicine, Department of Pediatrics, Çanakkale, Türkiye


ABSTRACT

Objective: The study aimed to determine the attitudes of parents with children aged 0-5 years towards protecting their children from COVID-19, the rate of those who hesitated to have their children vaccinated, and the factors causing hesitation.

Methods: In this descriptive, cross-sectional study, we conducted a survey with parents of children aged 0-5 years from July 2021 to May 2022.

Results: Four hundred and sixty-four parents with children 0-5 years of age were analyzed. The mean age of the participants was 34.6 ± 7.3 years and the mean number of children was 1.79 ± 0.78, the majority (72%) of which were mothers. The main source of information for COVID-19 was television channels for the participants (68.5%). Parents most often chose to wash their hands (91%) to prevent their children from contracting COVID-19. Fifty-seven percent of parents, especially those whose source of information for COVID-19 was social media platforms (OR 1.45 [1.0-2.1], p= 0.048), distrusted the measures they took to prevent their children from contracting COVID-19. Fifty-one percent of parents distrusted hospital measures to prevent transmission of COVID-19, and 55% were hesitant to get their children vaccinated for COVID-19. Increasing parental age (OR 1.02 [1.01-1.05], p= 0.040), having a family member who has had COVID-19 (OR 1.47 [1.01-2.16], p= 0.043), and parents’ trust in hospital COVID-19 measures (OR 2.04 [1.41-2.91], p= 0.001) have increased the desire to vaccinate their children against COVID-19.

Conclusion: Considering that vaccination is the most important step in preventing infection, information provided to parents by reliable authorities can help increase vaccination acceptance rates.

Keywords: Attitude, child, COVID-19, parents, vaccination

INTRODUCTION

The coronavirus-2019 (COVID-19) pandemic has become the largest modern public health emergency with 661 million infections diagnosed worldwide as of December 2022.1 Since the SARS-CoV-2 virus, which is the causative agent of the disease, is highly contagious, children of all ages can be affected, and its incidence in children is similar to that in adults. Their role in the spread of the disease cannot be ignored, as children can transmit COVID-19, whether they are symptomatic or not.2,3 Inevitably, interventions were needed both to contain the pandemic and to help parents protect their children from COVID-19.4-6 Although personal protective behaviors are very important in controlling the pandemic, vaccination is the most important step.7,8 Considering that the American Academy of Pediatrics recommends vaccination of all children aged 6 months and older with no contraindications, it can be predicted that the COVID-19 vaccination in children will now become the...
new ‘routine’. However, the emergences of new variants as well as the hesitation of vaccination are among the obstacles to control the disease. As with other vaccine-preventable diseases, vaccine hesitancy, which means delaying or refusing vaccination despite the availability of vaccines, has gained importance within the scope of COVID-19 vaccination in children as a result of medical mistrust. However, the success of the vaccination program depends on the public’s desire to be vaccinated. Because parents decide on behalf of their children, their attitudes toward vaccination play a vital role in their willingness to vaccinate their children. Unfortunately, COVID-19 is not the first virus to threaten humanity, and it may not be the last. Therefore, given the strong correlation between trust in healthcare providers and the medical system and vaccine acceptance, it is crucial to fully understand parents’ attitudes in order to establish an ecosystem of trust. In our study, we primarily focused on determining the attitudes of parents with children aged 0-5 years to protect their children from COVID-19 infection, the rate of those who hesitated to vaccinate their children, and the factors causing the hesitation.

**MATERIALS AND METHODS**

**Study design**

In this descriptive, cross-sectional study, we conducted a survey of parents of children aged 0-5 years from July 2021 to May 2022.

**Target population, study sample and data collection**

The target population was the parents of children aged 0-5 years who were followed up in the Pediatrics Clinic of Çanakkale Onsekiz Mart University Hospital, who could read and understand Turkish. We conducted the research at a time when COVID-19 vaccines were not yet approved for children in this age group. In the literature review on vaccine hesitancy in the community, it was reported that 65.4% of parents with children aged 0-5 years were hesitant to have their children vaccinated against COVID-19. The sample size was calculated using the formula $n=Z^2_a P (1-P) / d^2$. In the formula, $Z_a=1.96$ for the 95% confidence interval and the estimated acceptable margin of error $d=0.05$, and the minimum sample size was calculated as 386 parents. However, we collected a larger sample to better represent the target population.

**Study procedure**

The protocol and informed consent of the study were approved by the Clinical Research Ethics Committee of Çanakkale Onsekiz Mart University [date: 09.06.2021, no: 2021-06]. Before participating in the study, members of the research team experienced in conducting surveys asked each parent if they could participate in the study after introducing themselves. Interested participants were informed of the identity of the researcher, the purpose/importance of the research, the fact that participation is voluntary, the survey will not contain the personal information of the participants, the duration of the survey, how the data will be stored, they can stop filling out the survey whenever they want, and the information will be used for scientific research purposes. Written informed consent was obtained from those who agreed to participate in the study. Participants were not offered any incentives for their time.

**Survey instrument**

Within the scope of the research, a survey developed based on the literature was used to determine the attitudes of the parents. In addition to the questions in Table 1, the form included the parent’s gender, age, number of children, residence (rural/urban), level of education (secondary education or lower/ Bachelor’s degree or higher), COVID-19 information sources (Table 2), history of COVID-19 infection, and personal precautions taken to prevent the transmission of COVID-19 to their child. The self-administered questionnaire consisted of 17 questions that could be completed in 5 minutes.

**Outcome measures**

The primary outcome was parents’ attitudes toward protecting their children from COVID-19, the secondary outcome was the proportion of those who hesitated to vaccinate their children with COVID-19 vaccines, and the tertiary outcome was to identify risk factors for vaccine hesitancy.

**Data analysis**

The Statistical Package for the Social Sciences program (SPSS, version 23.0, IBM Company) was used for statistical analysis of the data. Descriptive statistics such as mean ± standard deviation (SD), frequency (n), and percentage (%) were used to generate summary tables for study variables. Univariate binary logistic regression analysis was performed to determine the relationship between participants’ socio-demographic characteristics and sources of information, and their trust in protective measures and their intention to have their children vaccinated against COVID-19. A p value of < 0.05 was used to determine the statistical significance.
**RESULTS**

**Parents characteristics and source of COVID-19 information**

Of 526 participants with children 0-5 years old, 464 (88.2%) were analyzed (Figure 1). The mean age of the participants was 34.6±7.3 years, and the mean number of children was 1.79±0.78. The majority (72%) were mothers, those living in the city (87.9%), those with secondary education or lower (69%). The sources of information for COVID-19 were mostly television channels, social media platforms, and the website of the Ministry of Health. The socio-demographic characteristics and information sources of the parents are presented in Table 2.

**Parents’ attitudes and trust in protecting their children from COVID-19**

Ninety-two percent of the parents were concerned about their child being infected with COVID-19. Washing hands (91%), ventilating the room (80%), and wearing masks (74%) were the most frequently preferred practices of parents to prevent their children from contracting COVID-19, and not sending them to daycare and leaving them in the house were also among the preferred practices (Table 3). Fifty-seven percent of parents, especially those whose source of information for COVID-19 was family members/friends (OR 1.9 [1.27-2.84], p= 0.002) or social media platforms (OR 1.45 [1-2.1], p= 0.048), distrusted the measures they took to prevent their children from contracting COVID-19. Fifty-one of the parents did not trust the measures

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answers (numbers of parents, [percentage])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you worried about your child contracting COVID-19?</td>
<td>Yes (428 [92]) No (36 [8])</td>
</tr>
<tr>
<td>How well do you follow physical distancing rules?</td>
<td>Always (352 [76]) Sometimes/never (112 [24])</td>
</tr>
<tr>
<td>Do you think children are transmitting the COVID-19 infection?</td>
<td>Yes (294 [63]) No/not sure (170 [37])</td>
</tr>
<tr>
<td>Do you trust the measures you take to prevent the transmission of COVID-19?</td>
<td>Yes (201 [43]) No/not sure (263 [57])</td>
</tr>
<tr>
<td>If your child had a fever and/or cough, would you take them to the hospital immediately?</td>
<td>Yes (341 [73]) No/not sure (123 [27])</td>
</tr>
<tr>
<td>Do you think hospitals are more dangerous than other public places?</td>
<td>Yes (289 [62]) No/not sure (128 [28])</td>
</tr>
<tr>
<td>Can doctors transmit COVID-19 to your child during the examination?</td>
<td>Yes (177 [38]) No/not sure (287 [62])</td>
</tr>
<tr>
<td>Do you trust the measures taken in the hospital to prevent the transmission of COVID-19?</td>
<td>Yes (229 [49]) No/not sure (235 [51])</td>
</tr>
<tr>
<td>Would you to vaccinate your child for COVID-19?</td>
<td>Yes (210 [45]) No/not sure (254 [55])</td>
</tr>
</tbody>
</table>
taken in the hospital to prevent COVID-19 transmission. Thirty-eight percent of the parents, especially parents who have only one child (OR 2.13 [1.45-3.13], p= 0.048), thought that doctors could infect their children with COVID-19 during the examination (Table 1).

**Parents’ willingness to vaccinate their children against COVID-19**

Fifty-five percent of parents were hesitant about getting their children vaccinated for COVID-19 (Table 3). Parental gender, level of education, place of residence, number of children, and source of information for COVID-19 did not change willingness to vaccinate, but the desire to vaccinate their children increased slightly as parent age increased (OR 1.02 [1.01-1.05], p= 0.040). Having a family history of COVID-19 infection increased the willingness of parents to vaccinate their children (OR 1.47 [1.01-2.16], p= 0.043). In addition, trust in hospital measures to prevent transmission of COVID-19 was another factor that increased parents’ willingness to vaccinate their children (OR 2.04 [1.41-2.91], p= 0.001) (Table 4).

**DISCUSSION**

This study, which we conducted with the participation of 464 parents at a time when COVID-19 vaccines were not yet approved for children aged 0-5 years, has two main findings. Firstly, 57% of parents distrusted the measures they took to prevent their children from contracting COVID-19, 51% distrusted the measures taken in the hospital, and 38% thought doctors could transmit COVID-19 to their children during the examination. Secondly, 55% of parents were hesitant about getting their children vaccinated against COVID-19. Risk factors for vaccine hesitancy were found as lack of trust in the measures taken to prevent COVID-19 transmission in the hospital, and 38% thought doctors could transmit COVID-19 to their children during the examination. Secondly, 55% of parents were hesitant about getting their children vaccinated against COVID-19. Risk factors for vaccine hesitancy were found as lack of trust in the measures taken to prevent COVID-19 transmission in the hospital, young age of parents, and no family history of COVID-19 infection.

Studies evaluating the effectiveness of personal protective behaviors during the COVID-19 pandemic shows that behaviors such as mask use, maintaining physical distance and washing hands can prevent transmission.\(^\text{10,11}\) As in our study, it is known that the majority of parents take precautions such as using masks, washing hands and avoiding crowded environments because they are worried about their children being infected with COVID-19.\(^\text{6,20-22}\) However, despite all these precautions, parents may think that they cannot adequately protect their children from COVID-19.\(^\text{9}\) People tend to carry out preconceived ideas even when information is easily accessible.\(^\text{23}\) In addition, distrust of healthcare providers and the medical system in today’s society has been exacerbated by the inconsistencies in scientific communication during the COVID-19 era.\(^\text{23,24}\)
Since COVID-19 was an “infodemia” of both true and false information at the same time.\textsuperscript{25} Therefore, it is inevitable that parents are skeptical about the effectiveness of the protective measures taken. However, trust in science is even more important in times of social change and distress.\textsuperscript{26} Medical distrust, defined as “the tendency to distrust medical systems and personnel believed to represent the dominant culture in a given society”, is associated with less acceptance of medical advice.\textsuperscript{24} In our study, although the majority of parents took personal protective measures to protect their children from COVID-19, about half did not rely on these measures. For this reason, we think that the Ministry of Health and reliable scientists should inform parents about the effectiveness of protective measures and the safety of health services, especially through social media platforms.

Vaccination is a fundamental measure and an inalienable right to protect public health.\textsuperscript{14,27} Vaccination of children against COVID-19 is also important as it can reduce the spread by providing herd immunity as well as preventing the disease.\textsuperscript{20,28,29} It is reported that 38-87\% of parents with ≤5 children have a positive opinion about having their children vaccinated against COVID-19, and some have concerns about this issue.\textsuperscript{29,20,21,30,31} In general, factors that influence vaccine acceptance are trust (trust in vaccine efficacy and safety), indifference (perception of disease risk), evaluation (weighing up risks and benefits of vaccines), and restraint (availability of information about vaccines).\textsuperscript{20} Particularly, the rapid development of COVID-19 vaccines has raised concerns that the vaccine may be ‘experimental’, and/or that its side effects may not have been adequately investigated.\textsuperscript{21,32,33} Studies have shown that the lack of a reliable source of information about COVID-19 vaccines and concerns about their safety and efficacy in young children are associated with parents’ reluctance to have their children vaccinated against COVID-19.\textsuperscript{13,28} Similar to our study, Sabra et al.\textsuperscript{20} demonstrated that the majority of parents are hesitant to get vaccinated against COVID-19, even though they are worried about their child getting COVID-19 and perceive it as a serious illness. Therefore, we think that the main reason why parents do not want to have their children vaccinated against COVID-19 may be concerns about the safety of COVID-19 vaccines in children. However, as we have shown in our study, while low trust in healthcare personnel contributes negatively to this process, trust in healthcare, science and scientists contributes positively to vaccination.\textsuperscript{15,25,26,31,34-36} The effect of trust in science on attitudes towards vaccination indicates that the message conveyed must be scientifically reliable and understandable.\textsuperscript{34} Studies show that most parents require information about the COVID-19 vaccine, and providing sufficient information to hesitant parents increases their likelihood of vaccinating their children.\textsuperscript{6,37} However, given that doctors are the most preferred source of information for parents to vaccinate their children\textsuperscript{38}, and that hesitant parents trust their pediatricians the most\textsuperscript{19}, we think that pediatricians, in particular, should provide parents with comprehensive and objective information about the efficacy and safety of COVID-19 vaccines.

### Table 4. Factors affecting parents’ decision to vaccinate their 0-5 year old children with COVID-19

<table>
<thead>
<tr>
<th>Factors</th>
<th>OR (95% CI)*</th>
<th>p-value**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Father</td>
<td>1.12 (0.71-1.64)</td>
<td>0.586</td>
</tr>
<tr>
<td>Parent age</td>
<td>1.02 (1.01-1.05)</td>
<td>0.040</td>
</tr>
<tr>
<td>Number of children</td>
<td>1.08 (0.85-1.36)</td>
<td>0.515</td>
</tr>
<tr>
<td>Family history of COVID-19 infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.47 (1.01-2.16)</td>
<td>0.043</td>
</tr>
<tr>
<td>No</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>I trust personal protective measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.84 (0.50-1.05)</td>
<td>0.071</td>
</tr>
<tr>
<td>No/Not sure</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>I trust the protective measures in the hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.04 (1.41-2.91)</td>
<td>0.001</td>
</tr>
<tr>
<td>No/Not sure</td>
<td>Reference</td>
<td></td>
</tr>
</tbody>
</table>

*OR (95% CI): Estimated relative risk and 95% confidence interval represented by odds ratio
**Boldface used to indicate statistical significance, where p-value <0.05
vaccination in children. The findings should be interpreted in light of some potential methodological limitations inherent in our study. Firstly, as in most surveys, parents may have given socially desirable responses rather than reflecting their actual behaviors, so interpreting the relationships described can be difficult. Secondly, since the survey was conducted in a region of Turkey, it may not reflect the situation across the country. Thirdly, because data on vaccines continue to be published, parents may have different perspectives than when our survey was conducted.

CONCLUSION

This study gives a brief idea of what parents need to vaccinate their 0-5 year old child against COVID-19. Especially considering that vaccination will be the most important step in preventing infection and nearly half of the parents are hesitant about vaccination, informing parents by reliable authorities, especially pediatricians, can help increasing vaccination acceptance rates. In addition, national studies are needed to investigate the causes of medical distrust in the safety of not only vaccination against COVID-19, but also future vaccination campaigns.

Ethical approval

This study has been approved by the Çanakkale Onsekiz Mart University Clinical Research Ethics Committee (approval date 09.06.2021, number 2021-06). Written informed consent was obtained from the participants.

Author contribution

Surgical and Medical Practices: TC, BBT; Concept: TC, BBT; Design: TC, BBT; Data Collection or Processing: TC, BBT; Analysis or Interpretation: TC, BBT; Literature Search: TC, BBT; Writing: TC, BBT. All authors reviewed the results and approved the final version of the article.

Source of funding

The authors declare the study received no funding.

Conflict of interest

The authors declare that there is no conflict of interest.

REFERENCES

7. Sun J, Xu Y, Qu Q, Luo W. Knowledge of and attitudes toward COVID-19 among parents of child dental patients during the outbreak. Braz Oral Res. 2020;34:e066. [Crossref]
12. Committee on Infectious Diseases. COVID-19 vaccines in infants, children, and adolescents. Pediatrics. 2022;150:e2022058700. [Crossref]
15. Zhang X, Guo Y, Zhou Q, Tan Z, Cao J. The Mediating Roles of Medical Mistrust, Knowledge, Confidence and Complacency of Vaccines in the Pathways from Conspiracy Beliefs to Vaccine Hesitancy. Vaccines (Basel). 2021;9:1342. [Crossref]
18. Nowak SA, Gidengil CA, Parker AM, Matthews LJ. Association among trust in health care providers, friends, and family, and vaccine hesitancy. Vaccine. 2021;39:5737-40. [Crossref]
20. Sabra HK, Bahr MA, Rageh OESM, Khaled A, Elbakliesh OM, Kabbash IA. Parents’ perception of COVID-19 risk of infection and intention to vaccinate their children. Vacunas. 2023;24:37-44. [Crossref]


23. Vranic A, Hromatko I, Tonković M. “I Did My Own Research”: Overconfidence, (Dis)trust in Science, and Endorsement of Conspiracy Theories. Front Psychol. 2022;13:931865. [Crossref]


32. Fedele F, Aria M, Esposito V, et al. COVID-19 vaccine hesitancy: a survey in a population highly compliant to common vaccinations. Hum Vaccin Immunother. 2021;17:3348-54. [Crossref]

33. Neumann-Böhme S, Varghese NE, Sabat I, et al. Once we have it, will we use it? A European survey on willingness to be vaccinated against COVID-19. Eur J Health Econ. 2020;21:977-82. [Crossref]

34. Seddig D, Maskilevson D, Davidov E, Ajzen I, Schmidt P. Correlates of COVID-19 vaccination intentions: Attitudes, institutional trust, fear, conspiracy beliefs, and vaccine skepticism. Sociol Health & Med. 2022;302:114981. [Crossref]


