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# Awareness of Covid-19 and attitudes toward vaccination in parents of children between 0 and 18 years: A cross-sectional study

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## ABSTRACT

**Purpose:** Many countries are struggling with the covid-19 pandemic. Although many measures have been adopted to reduce the transmission of the virus, vaccination is the only solution for controlling and ending the pandemic. The purpose of this study is to evaluate the awareness of covid-19 and attitudes toward covid-19 vaccination in parents.

**Design and study:** The research is a descriptive and cross-sectional study. The online survey was conducted. The population of the study consisted of parents of children aged 0–18 who agreed to participate through the social media (Facebook and Instagram) between May 26 and July 7, 2021. With the community research model, the minimum sample size was determined as 384. A parent description form and the Coronavirus (Covid-19) Awareness Scale (CAS) were used for data collection.

**Results:** The mean Contagion Precaution Awareness sub-factor score of the CAS was  $28.84 \pm 10.55$ , the mean Awareness of Following Current Developments sub-factor score was  $10.27 \pm 4.63$ , and the Hygiene Precaution Awareness sub-factor score was  $9.54 \pm 3.55$ . Thirty-seven percent of the parents wanted their child/children to be vaccinated against Covid-19. A statistically significant association was determined between wished to have their child/children vaccinated against covid-19 and the mean CAS sub-factors scores ( $p < 0.05$ ).

**Conclusions/practice implications:** Parents' awareness of covid-19 in this study was moderate. The willingness of parents to have their children vaccinated against covid-19 was also low. In order to increase Covid-19 vaccination rates, doubts and lack of information concerning the vaccine need to be overcome by identifying reasons for vaccine hesitancy.

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## Introduction

Covid-19 is a respiratory disease caused by the novel coronavirus SARS-CoV-2, discovered in 2019. The virus is thought to be transmitted from person to person through respiratory droplets emitted by an infected individual coughing, sneezing, or speaking (CDC, 2021a). The World Health Organization (WHO) reports that 172,345,882 individuals had been infected since the start of the pandemic up to 13 July 2021, that 98% of cases to date have been cured, while mortality has occurred in 2%. In addition, as of 13 July 2021, there were reported to be 12,107,917 active cases worldwide, 99.3% of which were mild, while 0.7% were severe or critical. In Turkey, 5,493,244 individuals were reported to have been infected as of 13 July 2021, with 50,324 deaths (WHO, 2021a).

Measures aimed at reducing the spread of Covid-19 and protecting the individual and others include wearing masks that cover the nose

and mouth, maintaining social distancing of approximately 2 m, avoiding crowded and enclosed areas, frequent handwashing with soap and water or disinfectant if these are unavailable, and Covid-19 vaccination (CDC, 2021b).

Despite several methods being available for slowing the transmission of the virus, vaccination is the sole means of controlling and eradicating the pandemic (Bell et al., 2020; Caserotti et al., 2021; Pogue et al., 2020). All countries fighting the Covid-19 pandemic are racing to develop and apply a safe and effective vaccine against the virus. The first mass vaccination program in the world commenced in December 2020 (WHO, 2021b). All countries have their own national Covid-19 vaccination strategies, and different countries have approved the use of different Covid-19 vaccines. The Pfizer-BioNTech, Moderna and Janssen Covid-19 vaccines have been approved by the U.S. Food and Drug Administration (FDA) (FDA, 2021). The Covid-19 vaccines approved in the United Kingdom are Pfizer/BioNTech, Oxford/AstraZeneca, Janssen, and Moderna (NHS, 2021). The Sinovac and Pfizer-BioNTech vaccine are administered in Turkey. Agreement has also been reached for Sputnik V to be manufactured in Turkey.

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Various priority groups are identified based on an evaluation of risks of exposure to Covid-19 disease, a severe course, and transmission to others, and vaccines are administered in order of priority (Bell et al., 2020; Turkish Ministry of Health COVID-19 Vaccination Information Platform, 2021). All vaccines have been approved for adult use, while vaccine tests for children are still continuing, and children are not currently vaccinated. However, the WHO has concluded that the Pfizer/BioNTech vaccine is suitable for use in children aged 12 years or more. This vaccine is recommended for children aged 12–15 years with a high risk of severe Covid-19 (WHO, 2021c).

In order for a vaccination program to be successful, the vaccine must be accepted by the great majority of the population (Bell et al., 2020; Pogue et al., 2020). The main causes of vaccine refusal include believing that the vaccine is ineffective, and general distrust of vaccines (Al-Qerem & Jarab, 2021; Bell et al., 2020; Eguia et al., 2021; Pogue et al., 2020; Taylor et al., 2020), and concerns over the safety of vaccines (Ahmed et al., 2021; Bell et al., 2020; Neumann-Böhme et al., 2020; Pogue et al., 2020; Taylor et al., 2020; Yoda & Katsuyama, 2021). Unfavorable attitudes toward vaccines and reluctance or uncertainty on the subject of vaccination represent the principal obstacles to long-term pandemic management (Paul et al., 2021). For that reason, before producing appropriate policies and preparations for Covid-19 vaccination, unfavorable opinions concerning vaccines need to be identified (Eguia et al., 2021). It is therefore of very great importance to determine awareness of Covid-19 and the acceptability of vaccines. However, studies and information on this subject are insufficient. The purpose of this study was to evaluate Covid-19 awareness among parents of children aged 0–18 years and the acceptability for children of a future Covid-19 vaccine.

## Research hypotheses

Those with high education and socioeconomic status, who and their child/children had infected with Covid-19, who lost a close friend or relative to Covid-19, who are anxious about their child/children getting Covid-19 disease, who think Covid-19 is very dangerous and who are health workers parents have higher awareness of coronavirus.

Parents with high covid-19 awareness are more willing to have their child/children vaccinated against Covid-19 than parents with low Covid-19 awareness.

## Methods

### Participants

This descriptive, cross-sectional study was conducted between 26 May and 7 July 2021. The study population consisted of parents of children aged 0–18 agreeing to take part through the social media (Facebook and Instagram) in Turkey between those dates. The sample size was determined using the formula shown below adopting  $N > 10,000$  as the total research model.

$$N = \frac{S^2 \times Z_{\alpha}^2}{d^2}$$

Standard deviation in the formula was set at  $S = 1 Z_{0.05} = 1.96$  with an effect size (d) of 0.1, and a minimum sample size of 384 was calculated (Fig. 1).

### Materials

A parent description form and the Coronavirus (Covid-19) Awareness Scale (CAS) were used for data collection via Google Forms.

### Parent description form

This form was prepared by reviewing the relevant literature. (Brandstetter et al., 2021; Hetherington et al., 2020; Lima et al., 2020; Yilmaz & Sahin, 2021; Zhang et al., 2020). This consists of three sections, one of six questions investigating parents' sociodemographic characteristics, one of eight questions about Covid-19, and one of five questions about vaccines.

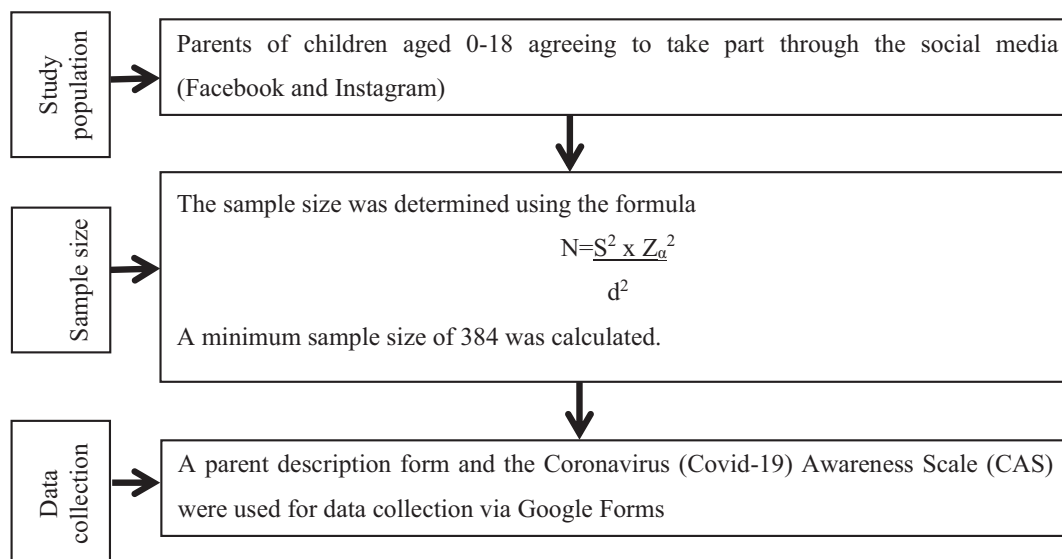


Fig. 1. Data collection and recruitment flowchart.

Coronavirus (Covid-19) awareness scale (CAS)

The CAS was developed by Bilgin (2020) for measuring awareness of Covid-19. It consists of 17 items and three sub-factors – Contagion Precaution Awareness (items 1–9), Awareness of Following Current Developments (items 10–13), and Hygiene Precaution Awareness (items 14–17). The CAS is a five-point Likert-type scale (1 = never, 2 = rarely, 3 = frequently, 4 = generally, 5 = always). No items are reverse-scored. The sub-factors are evaluated separately. The highest possible scores are 45 for the Contagion Precaution Awareness and 20 for the Awareness of Following Current Developments and Hygiene Precaution Awareness sub-factors. High scores on the sub-factors indicate a high level of awareness of that factor (Bilgin, 2020). Permission was obtained from the author who developed the scale.

Statistical analysis

Data analysis was performed on SPSS 23.0 software (Statistical Package for Special Sciences). Since the data were found not to be normally distributed with the Kolmogorov Smirnov test, non-parametric tests were applied. Descriptive analyses (percentage, arithmetic mean etc.), the Mann Whitney U test, the Kruskal Wallis test, and correlation analysis (Spearman Brown Rank-Order Correlation Coefficient).

Results

The mean age of the parents was 38.98 ± 8.65 years, 68.8% were mothers, 20.8% were health workers (nurse, midwife, physician, dentist, pharmacist, or emergency medicine technician), and 90.1% were married. In addition, 64.3% of parents were educated to university level or higher, and 64.6% had moderate socioeconomic levels.(Table 1).

Analysis showed that 35.7% of parents had been infected with Covid-19, the children of 22.1% had also been infected with Covid-19, 88.0% were anxious concerning their children contracting Covid-19, 38.8% had lost a close friend or relative to Covid-19, 46.6% regarded their levels of knowledge concerning Covid-19 as adequate, 66.1% regarded Covid-19 as highly dangerous, 26.0% regarded the social protective measures adopted against Covid-19 as adequate and 65.4% regarded the personal protective measures adopted against Covid-19 as adequate. In addition,

**Table 1**  
Distribution of parents' descriptive characteristics.

| Descriptive characteristics   | Min-Max | X ± SS       |
|---|---------|--------------|
| Mean age  | 19–67   | 38.98 ± 8.65 |
| Gender of the parents   | N       | %            |
| Mother  | 264     | 68.8         |
| Father  | 120     | 31.3         |
| Occupation  | N       | %            |
| Health workers (nurse, midwife, physician, dentist, pharmacist, or emergency medicine technician) | 80      | 20.8         |
| Housewife   | 68      | 17.7         |
| Architect and engineer  | 67      | 17.4         |
| Private sector  | 56      | 14.6         |
| Teacher   | 41      | 10.7         |
| Officer   | 36      | 9.4          |
| Employee  | 36      | 9.4          |
| Marital status  | N       | %            |
| Married   | 346     | 90.1         |
| Single  | 38      | 9.9          |
| Education   | N       | %            |
| Primary school  | 48      | 12.5         |
| Secondary School  | 35      | 9.1          |
| High school   | 54      | 14.1         |
| University level or higher  | 247     | 64.3         |
| Socioeconomic status  | N       | %            |
| Low   | 59      | 15.4         |
| Moderate  | 248     | 64.6         |
| High  | 77      | 20.1         |

79.2% of parents had allowed their children to be given free-of charge-vaccines under the immunization schedule, 33.3% had been vaccinated against, 37% wished to have their children vaccinated against Covid-19 and Covid-19, 58.6% wished to receive the BioNTech/Pfizer vaccine. Additionally, 21.4% of parents were reluctant to receive Covid-19 vaccines because these were new and produced very quickly, 10.4% due to insufficient evidence concerning the effects and reliability of the vaccine, 6.3% due to fear of vaccine side-effects, 1.8% because they were not in the at-risk group, 1.3% due to having already contracted Covid-19 disease, and 0.3% because they regarded the vaccine as unnecessary (Table 2).

The mean CAS sub-factor scores were 28.84 ± 10.55 for Contagion Precaution Awareness, 10.27 ± 4.63 for Awareness of Following Current Developments, and 9.54 ± 3.55 for Hygiene Precaution Awareness (Table 3).

The mean CAS contagion and hygiene precaution awareness sub-factor scores differed significantly depending on the gender of the

**Table 2**  
Distributions of parental statements regarding Covid-19 and vaccination.

| Statements regarding Covid-19 and vaccination   | N   | %    |
|---|-----|------|
| Have you had infected with Covid-19?  |     |      |
| Yes   | 137 | 35.7 |
| No  | 247 | 64.3 |
| Have your child/children been infected with Covid-19?   | N   | %    |
| Yes   | 85  | 22.1 |
| No  | 299 | 77.9 |
| Are you anxious about your child/children getting covid-19?   | N   | %    |
| Yes   | 345 | 89.8 |
| No  | 39  | 10.2 |
| Have you lost a close friend or relative to Covid-19?   | N   | %    |
| Yes   | 149 | 38.8 |
| No  | 235 | 61.2 |
| Do you think you have adequate knowledge about Covid-19?  | N   | %    |
| Yes   | 179 | 46.6 |
| No  | 112 | 29.2 |
| Not sure  | 93  | 24.2 |
| How dangerous do you think Covid-19 is?   | N   | %    |
| Highly dangerous  | 254 | 66.1 |
| Moderately dangerous  | 115 | 29.9 |
| Not dangerous   | 15  | 3.9  |
| Do you think the social protective measures adopted against Covid-19 as adequate?                         | N   | %    |
| Yes   | 100 | 26.0 |
| No  | 284 | 74.0 |
| Do you think the personal protective measures adopted against Covid-19 as adequate?                       | N   | %    |
| Yes   | 251 | 65.4 |
| No  | 133 | 34.6 |
| Have you allowed your child/children to be given free-of charge-vaccines under the immunization schedule? | N   | %    |
| Yes   | 304 | 79.2 |
| No  | 80  | 20.8 |
| Have you been vaccinated against Covid-19?  | N   | %    |
| Yes   | 128 | 33.3 |
| No  | 256 | 66.7 |
| Do you wish your child/children to be vaccinated against Covid-19?  | N   | %    |
| Yes   | 142 | 37.0 |
| No  | 103 | 26.8 |
| Not sure  | 139 | 36.2 |
| Which Covid-19 vaccine do you wish your child to receive?   | N   | %    |
| Sinovac   | 75  | 41.4 |
| BioNTech/Pfizer   | 106 | 58.6 |
| What is your reason for being reluctant to receive the Covid-19 vaccine?                                  | N   | %    |
| I think the Covid-19 vaccine is new and produced very quickly   | 82  | 21.4 |
| Insufficient evidence for the effects and reliability of the vaccine                                      | 40  | 10.4 |
| I'm afraid of the side effect of the covid-19 vaccine   | 24  | 6.3  |
| I'm not in the at-risk group  | 7   | 1.8  |
| I have already contracted Covid-19 disease  | 5   | 1.3  |
| I think the Covid-19 vaccine is unnecessary   | 1   | 0.3  |

\* You can mark more than one option.

**Table 3**  
Mean parental CAS sub-factor scores.

| CAS sub-factors                             | Min-Max | X ± SS        |
|---|---------|---------------|
| Contagion Precaution Awareness              | 9–45    | 28.84 ± 10.55 |
| Awareness of Following Current Developments | 4–20    | 10.27 ± 4.63  |
| Hygiene Precaution Awareness                | 4–20    | 9.54 ± 3.55   |

parents ( $p < 0.05$ ), but no gender difference was observed in terms of mean Awareness of Following Current Developments sub-factor scores ( $p > 0.05$ ). Mothers exhibited greater contagion and hygiene awareness than fathers. Statistically significant associations were observed between mean CAS sub-factor scores and occupation, marital status, education, socioeconomic status, and number of children ( $p < 0.05$ ). Higher levels of coronavirus awareness were determined among parents who were teachers, married, and educated to university level or above. (Table 4).

Significant associations were observed between mean CAS Contagion Precaution Awareness sub-factor scores and a child or children having contracted Covid-19, having lost a close friend or relative to Covid-19, and regarding personal protection measures adopted against Covid-19 as adequate ( $p < 0.05$ ). However, no significant association was observed with mean Awareness of Following Current Developments or Hygiene Precaution Awareness scores ( $p > 0.05$ ). Parents who had themselves been infected with the disease or with a child or children who had contracted Covid-19, who had lost a close friend or relative to Covid-19, and who regarded personal protection measures

**Table 4**  
Mean CAS scores in terms of parental descriptive characteristics.

| Descriptive characteristics | Mean CAS sub-factor Scores     |   |                                |
|-----------------------------|--------------------------------|---|--------------------------------|
|                             | Contagion precaution awareness | Awareness of following current developments | Hygiene precaution awareness   |
| Gender of the parents       | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                  |
| Mother                      | 29.78 ± 10.61                  | 10.30 ± 4.81                                | 9.94 ± 3.66                    |
| Father                      | 26.78 ± 10.16                  | 10.20 ± 4.24                                | 8.65 ± 3.15                    |
| <b>Statistical analysis</b> | U = 13,345.0<br>$p = 0.013^*$  | U = 15,705.50<br>$p = 0.893$                | U = 12,626.50<br>$p = 0.001^*$ |
| Occupation                  | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                  |
| Health workers              | 30.88 ± 11.43                  | 11.30 ± 4.64                                | 10.26 ± 3.86                   |
| Housewife                   | 26.92 ± 9.34                   | 9.17 ± 4.65                                 | 9.08 ± 3.75                    |
| Architect and engineer      | 30.71 ± 10.10                  | 11.25 ± 4.02                                | 9.25 ± 3.06                    |
| Private sector              | 23.85 ± 10.15                  | 8.64 ± 3.79                                 | 8.46 ± 2.99                    |
| Teacher                     | 33.00 ± 9.37                   | 12.68 ± 4.89                                | 10.53 ± 3.39                   |
| Officer                     | 28.61 ± 10.97                  | 9.86 ± 5.07                                 | 10.02 ± 4.24                   |
| Employee                    | 27.69 ± 9.80                   | 8.47 ± 4.28                                 | 9.41 ± 3.10                    |
| <b>Statistical analysis</b> | KW = 24.314<br>$p = 0.000^*$   | KW = 29.066<br>$p = 0.000^*$                | KW = 12.749<br>$p = 0.026^*$   |
| Marital status              | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                  |
| Married                     | 29.64 ± 10.54                  | 10.46 ± 4.75                                | 9.68 ± 3.59                    |
| Single                      | 21.52 ± 7.44                   | 8.52 ± 2.86                                 | 8.28 ± 2.98                    |
| <b>Statistical analysis</b> | U = 3668.0<br>$p = 0.000^*$    | U = 5176.50<br>$p = 0.031^*$                | U = 5158.50<br>$p = 0.029^*$   |
| Education                   | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                  |
| Primary school              | 20.16 ± 8.16                   | 6.60 ± 3.58                                 | 7.52 ± 3.20                    |
| Secondary School            | 25.77 ± 8.31                   | 9.14 ± 4.39                                 | 9.48 ± 3.73                    |
| High school                 | 30.05 ± 9.31                   | 9.42 ± 3.969.40                             | 9.40 ± 3.48                    |
| University level or higher  | 30.70 ± 10.61                  | 11.33 ± 4.56                                | 9.97 ± 3.49                    |
| <b>Statistical analysis</b> | KW = 46.775<br>$p = 0.000^*$   | KW = 52.799<br>$p = 0.000^*$                | KW = 23.163<br>$p = 0.000^*$   |
| Socioeconomic status        | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                  |
| Low                         | 22.86 ± 8.77                   | 7.22 ± 4.04                                 | 8.40 ± 3.48                    |
| Moderate                    | 31.74 ± 9.88                   | 11.51 ± 4.37                                | 10.14 ± 3.58                   |
| High                        | 24.09 ± 10.34                  | 8.63 ± 4.32                                 | 8.46 ± 3.05                    |
| <b>Statistical analysis</b> | KW = 51.768<br>$p = 0.000^*$   | KW = 61.160<br>$p = 0.000^*$                | KW = 20.684<br>$p = 0.000^*$   |

\* $p < 0.05$  \*\* $p < 0.01$ .

adopted against Covid-19 as adequate exhibited greater contagion precaution awareness. Anxiety concerning a child or children contracting Covid-19 and the degree to which parents regarded the disease as dangerous were significantly associated with mean CAS contagion and hygiene precaution awareness scores ( $p < 0.05$ ). However, so statistically significant associated was determined with Awareness of Following Current Developments ( $p > 0.05$ ). Parents who were anxious about a child or children contracting Covid-19 and regarding the disease as moderately dangerous exhibited higher contagion and hygiene precaution awareness. Regarding their levels of information about Covid-19 as adequate and regarding the social protection measures adopted against the disease as sufficient were significantly associated with mean CAS sub-factor scores ( $p < 0.05$ ). Parents who regarded their levels of information about Covid-19 as adequate and regarding the social protection measures adopted against the disease as sufficient exhibited higher levels of coronavirus awareness (Table 5).

A statistically significant association was determined between parents wishing to have themselves and their children receive the Covid-19 vaccine and mean CAS sub-factor scores ( $p < 0.05$ ). Parents wishing to have themselves and their children receive the Covid-19 vaccine, or who were undecided on the subject, exhibited a higher level of coronavirus awareness (Table 6).

A statistically significant association as also determined between parents having their children receive the free-of-charge vaccines in the immunization schedule and wishing to have Covid-19 vaccination performed ( $p < 0.05$ ). More than half of the parents who had their children receive the free-of-charge vaccines in the immunization schedule were undecided concerning Covid-19 vaccination.

## Discussion

Studies have shown that people in several countries are opposed to the Covid-19 vaccine, although different hesitancy rates have been reported. For example, between 15.57% and 25% of participants in a study from the USA (Pogue et al., 2020; Taylor et al., 2020), 20% in Canada (Taylor et al., 2020), 14% in the UK (Paul et al., 2021), 17.5% in Brazil (Oliveira et al., 2021), 55.3% in Saudi Arabia (Magadmi & Kamel, 2020), 4.9% in Australia (Dodd et al., 2021), 33.2%–47.8% in China (Chen et al., 2021; Wang et al., 2020), 36.8% in Jordan (Al-Qerem & Jarab, 2021), 12.3% in Japan (Yoda & Katsuyama, 2021) and 3% in Turkey (Salali & Uysal, 2020) have reported being unwilling or doubtful concerning the vaccine. A study performed in seven European countries (Denmark, France, Germany, Italy, Portugal, the Netherlands, and the UK) reported that 7.2% of participants were unwilling to receive the vaccine. The highest rates of opposition to the vaccine were determined in residents of Germany and France (10%) (Neumann-Böhme et al., 2020).

Studies involving parents have reported different rates for parents and children (Brandstetter et al., 2021; Hetherington et al., 2020; Wang et al., 2021; Yilmaz & Sahin, 2021; Zhang et al., 2020). Fifty-eight percent of parents in Germany wished to be vaccinated themselves, while 51% wished to have their children vaccinated (Brandstetter et al., 2021), 44.5–72.6% of parents in China wished to have their children vaccinated (Wang et al., 2021; Zhang et al., 2020), 60% in Canada wished to have their children vaccinated (Hetherington et al., 2020), while 59.9% of parents in Turkey wished to receive the vaccine for themselves and 36.3% for their children (Yilmaz & Sahin, 2021). Parents in studies appear to be more reluctant for their children to be vaccinated than themselves (Lima et al., 2020). Similarly to previous studies from Turkey, the majority of parents in the present research allowed their children to receive free-of-charge vaccines in the immunization schedule, but only 37% wished to have their children receive the Covid-19 vaccine. We think that parents' reluctance to allow their children to receive the Covid-19 vaccine derives from its being new and untested for children. However, 33.3% of parents in the present study had received the Covid-19 vaccine themselves. The reason for this low level is that due to an insufficiency of vaccines in Turkey, vaccination

**Table 5**  
Parents' statements regarding Covid-19 and mean CAS scores.

| Statements regarding Covid-19 and vaccination                                       | Mean CAS sub-factor Scores     |   |                              |
|---|--------------------------------|---|------------------------------|
|   | Contagion precaution awareness | Awareness of following current developments | Hygiene precaution awareness |
| Have you had infected with Covid-19?  | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Yes   | 26.13 ± 10.17                  | 9.82 ± 4.47                                 | 9.22 ± 3.47                  |
| No  | 30.34 ± 10.48                  | 10.52 ± 4.71                                | 9.72 ± 3.59                  |
| <b>Statistical analysis</b>   | U = 12,926.0<br>p = 0.000*     | U = 15,445.0<br>p = 0.155                   | U = 15,788.50<br>p = 0.276   |
| Have your child/children been infected with Covid-19?                               | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Yes   | 25.84 ± 10.14                  | 9.60 ± 4.50                                 | 8.94 ± 3.47                  |
| No  | 29.69 ± 10.53                  | 10.46 ± 4.66                                | 9.71 ± 3.56                  |
| <b>Statistical analysis</b>   | U = 10,126.50<br>p = 0.004*    | U = 11,307.50<br>p = 0.119                  | U = 11,178.50<br>p = 0.089   |
| Are you anxious about your child/children getting covid-19?                         | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Yes   | 29.45 ± 10.31                  | 10.37 ± 4.57                                | 9.73 ± 3.52                  |
| No  | 23.46 ± 11.24                  | 9.35 ± 5.15                                 | 7.84 ± 3.45                  |
| <b>Statistical analysis</b>   | U = 4516.0<br>p = 0.001*       | U = 5667.50<br>p = 0.105                    | U = 4447.50<br>p = 0.000*    |
| Have you lost a close friend or relative to Covid-19?                               | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Yes   | 26.53 ± 10.35                  | 9.95 ± 4.56                                 | 9.23 ± 3.61                  |
| No  | 30.31 ± 10.44                  | 10.48 ± 4.68                                | 9.74 ± 3.51                  |
| <b>Statistical analysis</b>   | U = 13,977.0<br>p = 0.001*     | U = 16,335.50<br>p = 0.267                  | U = 16,081.50<br>p = 0.117   |
| Do you think you have adequate knowledge about Covid-19?                            | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Yes   | 28.79 ± 11.32                  | 10.96 ± 4.74                                | 9.50 ± 3.66                  |
| No  | 25.73 ± 9.50                   | 9.06 ± 4.70                                 | 8.91 ± 3.30                  |
| Not sure  | 32.68 ± 8.93                   | 10.40 ± 4.06                                | 10.36 ± 3.51                 |
| <b>Statistical analysis</b>   | KW = 21.198<br>p = 0.000*      | KW = 14.176<br>p = 0.001*                   | KW = 7.484<br>p = 0.024*     |
| How dangerous do you think Covid-19 is?   | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Highly dangerous  | 28.55 ± 10.66                  | 10.27 ± 4.74                                | 9.88 ± 3.59                  |
| Moderately dangerous  | 30.54 ± 9.53                   | 10.69 ± 4.24                                | 9.31 ± 3.34                  |
| Not dangerous   | 20.66 ± 12.44                  | 7.13 ± 4.65                                 | 5.60 ± 1.18                  |
| <b>Statistical analysis</b>   | KW = 11.467<br>p = 0.003*      | KW = 10.508<br>p = 0.005                    | KW = 25.734<br>p = 0.000*    |
| Do you think the social protective measures adopted against Covid-19 as adequate?   | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Yes   | 25.62 ± 10.90                  | 8.31 ± 4.06                                 | 8.21 ± 3.13                  |
| No  | 29.97 ± 10.20                  | 10.96 ± 4.63                                | 10.01 ± 3.68                 |
| <b>Statistical analysis</b>   | U = 10,756.0<br>p = 0.000*     | U = 9373.0<br>p = 0.000*                    | U = 10,011.0<br>p = 0.000*   |
| Do you think the personal protective measures adopted against Covid-19 as adequate? | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Yes   | 27.69 ± 10.83                  | 10.01 ± 4.56                                | 9.34 ± 3.51                  |
| No  | 31.01 ± 9.66                   | 10.75 ± 4.74                                | 9.92 ± 3.62                  |
| <b>Statistical analysis</b>   | U = 13,825.0<br>p = 0.006*     | U = 15,268.0<br>p = 0.167                   | U = 15,085.0<br>p = 0.119    |

\*p &lt; 0.05.

commenced with at-risk groups and the elderly. Vaccination was performed in this manner during the data collection stage of this study. However, there are currently abundant stocks of vaccine in Turkey, and everyone who wishes is vaccinated, irrespective of age and risk.

We therefore think that parental vaccination rates will have increased by now.

Some of the most important reasons for parents being reluctant to have their children vaccinated are anxieties about the reliability of the

**Table 6**  
Parents' statements concerning the vaccine and mean CAS.

| Statements concerning the vaccine                                  | Mean CAS sub-factor Scores     |   |                              |
|--|--------------------------------|---|------------------------------|
|  | Contagion precaution awareness | Awareness of following current developments | Hygiene precaution awareness |
| Have you vaccinated against Covid-19?                              | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Yes  | 30.89 ± 10.55                  | 11.22 ± 4.74                                | 10.11 ± 3.62                 |
| No   | 27.82 ± 10.42                  | 9.80 ± 4.51                                 | 9.25 ± 3.49                  |
| <b>Statistical analysis</b>  | U = 13,673.0<br>p = 0.008*     | U = 13,558<br>p = 0.006*                    | U = 13,917.50<br>p = 0.016*  |
| Do you wish your child/children to be vaccinated against Covid-19? | <b>X ± SS</b>                  | <b>X ± SS</b>                               | <b>X ± SS</b>                |
| Yes  | 29.64 ± 10.63                  | 11.04 ± 4.75                                | 10.21 ± 3.72                 |
| No   | 26.13 ± 11.34                  | 9.34 ± 4.58                                 | 8.57 ± 3.43                  |
| Not sure   | 30.03 ± 9.53                   | 10.17 ± 4.45                                | 9.58 ± 3.32                  |
| <b>Statistical analysis</b>  | KW = 9.688<br>p = 0.008*       | KW = 8.790<br>p = 0.012*                    | KW = 14.569<br>p = 0.001*    |

\* p &lt; 0.05.

vaccine and its side-effects (Hetherington et al., 2020; Yigit et al., 2021; Yilmaz & Sahin, 2021), a lack of sufficient scientific research (Hetherington et al., 2020; Yilmaz & Sahin, 2021), doubts about the assistant substances in the vaccine, and lack of belief in its efficacy (Yigit et al., 2021), fear of long-term side-effects (Hetherington et al., 2020), and the fact the vaccine is new and was produced in haste (Bell et al., 2020; Hetherington et al., 2020). Consistent with previous studies, parents in the present study were reluctant to have Covid-19 vaccines administered for reasons such as the vaccine being new and produced very quickly, a lack of sufficient evidence about its effectiveness and reliability, fear of vaccine side-effects, being in an at-risk group, having already had Covid-19 disease, and believing the vaccine is unnecessary.

Increasing awareness of Covid-19 can also reduce the spread of the disease (Akwa et al., 2020). However, studies on the subject have determined only moderate levels of awareness of Covid-19 (Alahdal et al., 2020; Labban et al., 2020). Similarly in the present study, parents exhibited a moderate level of awareness of Covid-19. In addition, 46.6% of parents regarded their level of knowledge of Covid-19 as adequate.

Alahdal et al. (2020) reported that fathers possessed higher levels of awareness of Covid-19 than mothers (Alahdal et al., 2020), while in the present study, mothers exhibited higher levels of awareness and hygiene precautions. We attribute this to mothers playing a greater role and assuming greater responsibility in child care in Turkey. Sizer et al. (2020) and Labban et al. (2020) reported a higher level of information concerning Covid-19 among individuals with high education and income levels (Labban et al., 2020; Sizer et al., 2020). In addition, Labban et al. (2020) determined greater information concerning Covid-19 among health workers. In the present study, and consistent with other research, parents educated to university level and above exhibited greater awareness of Covid-19. However, although healthcare workers represented the largest group in our sample (20.8%), parents who were teachers exhibited higher levels of Covid-19 awareness. This may be associated with parents' learning and research characteristics deriving from their occupations. It is also possible that awareness declined in healthcare worker parents since they had come to regard Covid-10 as a normal part of life.

Parents who fear contracting Covid-19, or that their children may become infected, hold more favorable opinions concerning the Covid-19 vaccine and are more willing to have their children immunized (Yigit et al., 2021; Yilmaz & Sahin, 2021). However, parents in regions where the virus is less common are less desirous of having their children vaccinated (Lima et al., 2020). Occupation, marital status, education level, and socioeconomic status all affect parents' willingness to have their children vaccinated. Parents with high levels of education (Brandstetter et al., 2021; Yilmaz & Sahin, 2021), those with good economic status (Bell et al., 2020; Yilmaz & Sahin, 2021), parents with a single child (Yilmaz & Sahin, 2021), and parents who are health workers (Wang et al., 2020; Yilmaz & Sahin, 2021) are generally more eager to have their children vaccinated. However, in contrast to these studies, Hetherington et al. (2020) reported that parents with low levels of education and poor economic status were more willing to have their children vaccinated (Hetherington et al., 2020).

Parents who are hesitant about having their children immunized in childhood are also reported to be less willing to have their children vaccinated against Covid-19 (Lima et al., 2020). In the present study, a statistically significant association was determined between parents allowing their children to receive free-of-charge vaccines in the immunization schedule and the wish to have children vaccinated against Covid-19. More than half of the parents who allowed their children to receive free-of-charge vaccines in the immunization schedule were found to want their children to be vaccinated against Covid-19, or undecided on the subject. However, Yilmaz and Sahin (2021) determined no significant association between allowing children to receive free-of-charge vaccines in the immunization schedule and the wish to have

children vaccinated against Covid-19. In the study of Wang et al. (2021) with Chinese healthcare workers, it was determined that the acceptability of the Covid-19 vaccine for children under the age of 18 was low (Wang et al., 2021).

### Practice implications

In order to increase Covid-19 vaccination rates, doubts and lack of information concerning the vaccine need to be overcome by identifying reasons for vaccine hesitancy. Doubts and lack of information concerning the vaccine can be resolved by providing greater information on the subject and through vaccination campaigns.

### Limitations

The Discussion section was limited by the insufficiency of studies evaluating parents' awareness of Covid-19 together with their acceptance of Covid-19 vaccination for their children. Since this study was conducted with a small number of samples, it cannot be generalized to the whole population. Since we collect data from social media (Facebook and Instagram), there is no specific location where the research was conducted.

### Conclusions

In conclusion, the parents in this study exhibited a moderate level of awareness of Covid-19. In addition, parental desire to have their children vaccinated against Covid-19 was low.

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### Ethical approval and permissions

Before commencement of the research, permission was obtained from the Health Ministry Health Services General Directorate Scientific Research Platform, and approval was granted by the XXX University Non-Interventional Clinical Research Ethical Committee.

### Author statement

EBK and HK contributed to the planning and design of the study. EBK and HK assembled the data. EBK performed the statistical analysis, interpreted the data and assisted with the revisions of the article, read and approved the final article.

### Declaration of Competing Interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this study.

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EBK ve HK contributed to the study conception and design. Material preparation were performed by EBK. Data collection were performed by EBK and HK. Data analysis were performed and the first draft of the manuscript was written by EBK. EBK and HK commented on previous versions of the manuscript, read and approved the final manuscript.

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