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**ARAŞTIRMA MAKALESİ /** RESEARCH ARTICLE

# Mothers' Attitudes Toward Measles Vaccination and Vaccine Hesitancy: A Cross-Sectional Study

## *Annelerin Kızamık Aşısına ve Aşı Tereddütlerine Yönelik Tutumları: Kesitsel Bir Çalışma*

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## ABSTRACT

**Introduction:** The increase in vaccine-preventable diseases has recently been attributed to vaccine refusal or hesitancy. The study aimed to determine mothers' attitudes and approaches towards vaccines, particularly the measles vaccine.

**Material and Methods:** This descriptive and cross-sectional study was conducted between October 2023 and May 2024. A total of 403 mothers living with their children in the same home were included in the study using convenience sampling. Data were collected using a mother and child information form, a vaccination information form, and the perceptions about infectious diseases scale. In the analysis of the data, significance was determined at a 95% confidence interval.

**Results:** Mothers were 32,3 years old on mean, and nearly half of them were university graduates. Among the mothers, 88,1% reported that they themselves wanted to be vaccinated, and 72% reported that they trusted vaccine information. It was determined that those who reported that they were not affected by the vaccination opinions of their surroundings and that the vaccination program in our country was reliable. Among mothers, 17,4% reported being exposed to misinformation such as "vaccines are unnecessary," and 7,3% reported being exposed to misinformation such as "vaccines cause autism." An average score of 144,1 points was obtained on the scale. The scale score was found to be affected by the parents' age, education, and income level ($p<0,05$).

**Conclusion:** Negative attitudes towards vaccines are often due to a lack of information. Therefore, it is recommended that health professionals emphasize vaccine information approaches. In addition, efforts should be made to eliminate vaccine refusal/hesitancy through social projects. The importance of information prepared by using scientific evidence should not be forgotten.

**Keywords:** Measles vaccination, vaccine hesitancy, mothers

## ÖZ

**Giriş:** Aşı ile önlenebilir hastalıkların artışı son zamanlarda aşı reddine veya tereddütüne bağlanmaktadır. Çalışmada annelerin aşılara, özellikle kızamık aşısına karşı tutum ve yaklaşımlarını belirlenmesi amaçlanmıştır.

**Materyal ve Metodlar:** Bu tanımlayıcı ve kesitsel çalışma, Ekim 2023 ile Mayıs 2024 tarihleri arasında yürütüldü. Aynı evde çocuklarıyla yaşayan toplam 403 anne, kolayda örneklemeyle çalışmaya alındı. Veriler, anne ve çocuk bilgi formu, aşı bilgi formu ve bulaşıcı hastalıklar hakkındaki algılar ölçeği kullanılarak toplandı. Verilerin analizinde, anlamlılık %95 güven aralığında belirlendi.

**Bulgular:** Anneler ortalama 32,3 yaşında olup neredeyse yarısı üniversite mezunuydu. Annelerin %88,1'i kendilerinin aşı olmak istediklerini ve %72'si ise aşı bilgilerine güvendiklerini bildirdi. Çocuğu aşı olduktan sonra kızamık geçirenlerin hastalığı hafif atlattıkları tespit edildi. Yarısından fazlası çevrelerindeki aşı görüşlerinden etkilenmediklerini ve ülkemizdeki aşı programının güvenilir olduğunu bildirmiştir. Annelerin %17,4'ü "aşılar gereksizdir", %7,3'ü "aşılar otizme neden olur" şeklinde yanlış bilgilere maruz kaldığını bildirmiştir. Ölçekten ortalama 144,1 puan elde edilmiştir. Ölçek puanını ise ebeveynlerin yaşı, eğitim ve gelir düzeyinin etkilediği bulunmuştur ($p<0,05$).

**Sonuç:** Aşılara karşı olumsuz tutumlar genellikle bilgi eksikliğinden kaynaklanmaktadır. Bu nedenle, sağlık profesyonellerinin aşı bilgilendirme yaklaşımlarını vurgulamaları önerilmektedir. Ayrıca, sosyal projeler yoluyla aşı reddi/tereddütünü ortadan kaldırmak için çaba gösterilmelidir. Bilimsel kanıtlar kullanılarak hazırlanan bilgilerin önemi unutulmamalıdır.

**Anahtar Sözcükler:** Kızamık aşısı, aşı tereddütü, anneler

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## Introduction

Infectious diseases cause morbidity and mortality worldwide, especially in childhood (1). Measles is an acute viral infection that affects both children and adults and can lead to serious complications (2,3). Especially in developing countries, complications such as pneumonia, diarrhea, otitis media, blindness, encephalitis and Subacute Sclerosing Panencephalitis (SSPE) can be seen (4). In Türkiye, measles vaccine has been included in the routine vaccination schedule since 2006 (5). However, the number of cases reported between 2022 and 2024 shows that vaccination rates are insufficient and the risk of transmission is an ongoing public health threat (6,7).

Recently, there has been a dramatic increase in measles cases. By 2024, reported measles cases in Europe and Central Asia reached 127.350, the highest level in 25 years (8). In Türkiye, 4.698 cases were reported in the last two years (April 2023 – March 2024) (7). This increase is attributed to factors such as the interruption of vaccinations during the COVID-19 pandemic, vaccine instability and misinformation (9). As measles is a highly contagious disease, although at least 95% vaccination rate should be achieved to ensure community immunity, this rate has not been achieved in many countries (10). Despite preventable diseases such as measles, vaccine hesitancy and refusal jeopardize public health (11). In particular, erroneous studies suggesting an association between vaccines and autism (and their media coverage) have led to public mistrust and an increase in vaccine refusal (12–14) Today, immunization is one of the most effective and affordable preventive health services and is indispensable for the sustainability of public health (15,17). In the literature, studies evaluating mothers' attitudes towards measles vaccination in Türkiye in a holistic manner are limited (5,15). Mothers are the most important determinants and primary decision-makers regarding decisions about vaccinating children (18). Furthermore, since perceptions and attitudes about children's health are largely shaped by mothers, examining this group provides a more accurate picture of the reasons for vaccine hesitancy (19). This study aims to examine the attitudes of women who have children towards measles vaccination and to reveal their current level of knowledge, feelings of confidence and reasons for indecision. This study will provide a basis for targeted interventions by analyzing the relationship between mothers' attitudes and vaccine hesitancy with up-to-date data. It will also provide a basis for policy recommendations to strengthen the role of health professionals in building trust.

### *Research questions*

- What are the attitudes of mothers who have children towards vaccinations?
- What are the attitudes of mothers who have children towards measles vaccination?
- What are the factors affecting the attitudes of mothers who have children towards measles vaccination?

## Material and Methods

### Study aims and design

This descriptive and cross-sectional study aimed to determine the attitudes and approaches of women who have children towards measles vaccination. The study was conducted via an online survey administered through Google Forms between October 2023 and May 2024.

### Participants

The study population consisted of mothers who were reachable in Türkiye between October 2023 and May 2024. In line with the relevant literature (19), the sample size was determined by performing a power analysis with the G*Power (v3.1.9.2) program. Accordingly, it was calculated that the minimum sample size required at 5% Type 1 error, 0,5% effect size and 95% confidence interval could be a total of 263,7 mothers. Considering factors such as data loss, incomplete responses, or failure to respond to the survey, the sample size was increased by 20% (20), and the study was planned to be completed with at least 290 mothers. Mothers were recruited through convenience sampling from the community. Convenience sampling is a non-random sampling method consisting of individuals who are accessible to the researcher and voluntarily participate in the study (21). All mothers who met the inclusion criteria were reached during the data collection process, and contrary to expectations, no data loss occurred. Therefore, the study was completed with 403 mothers, exceeding the predicted number. Having a child, agreeing to participate in the study and living in the same house with her child were the inclusion criteria, while having mental problems, being a foreign national and not speaking Turkish were the exclusion criteria.

### *Data collection tools*

In the study, 'The Mother and Child Information Form' , 'Vaccination Information Form' , and 'Perceptions About Infectious Diseases Scale' were used.

The mother and child information form was prepared by the researchers in line with the literature (15,16,22–27). The form consists of total 9 open-ended and closed-ended questions including descriptive information such as age, gender, and educational status.

The vaccination information form was created by the researchers in line with the literature (14,22,23,27,28). The form includes 24 open-ended and closed-ended questions inquiring information such as the vaccination status of their children, the reason for not vaccinating their children, and the status of getting measles disease.

Perceptions about infectious diseases scale developed in 2022 to measure the perception towards infectious diseases consists of 2 factors (perception towards protection methods, perception

towards transmission) and 34 items (25). A total of 34–170 points are obtained from the five-point Likert-type scale. An increase in the total and sub-dimensions of the scale indicates that the perception towards infectious diseases is positive (knowing the nature of infectious diseases, knowing the ways of transmission, being adequate in prevention and control). While the total Cronbach's alpha value of the scale was 0,90 (25), the total Cronbach's alpha value in this study was 0,95.

### Data collection

The form to be used and the questions in the scale were prepared in a computerized environment. The prepared form was published through web-based messaging applications and voluntary participants were invited to the study. Data were obtained from mothers who met the inclusion criteria and were easily accessible online using sampling methods. Before filling out the form, the text of "informed voluntary consent form on the internet" appears to the participants. In the consent text, information such as the purpose and duration of the study was given to the participants in writing in a language they could understand. After the mothers who read the text checked "I confirm" that they agreed to participate in the study, the questions became visible. It takes approximately 15–20 minutes to answer the questions.

### Ethical aspects of the study

The necessary ethics committee approval was obtained from local ethics committee (Date: 08.08.2023, Number: 2023/07). Informed consent was obtained from the participants online before the study. The principles of the Declaration of Helsinki were followed throughout the study.

### Data analysis

The data were computerized using IBM Statistical Package for Social Sciences (SPSS) program version 26. In the first stage, percentages and descriptive statistics were calculated. In the analysis of continuous data, mean, median, standard deviation, minimum and maximum values were calculated. In the analysis of categorical data, numbers and percentages were calculated. Normality distributions were examined before intra- and inter-group comparisons of variables. Normality distributions were analyzed by Shapiro-Wilk test. Accordingly, chi-square and Fisher Exact's chi-square tests were used for the comparison of paired groups. Mann-Whitney U test and Kruskal-Wallis tests were used in the comparison analysis of nonparametric variables. Tamhane's T2 test and Bonferroni tests were utilized to determine the group from which the significance originated since variance equality was not achieved. Significance was based on $p<0.05$ at 95% confidence interval.

## Results

The study was completed with 403 women with an average age of 32.3 years. Table 1 shows the distribution of scale total and subscale scores. The total score of the Perception Scale for Communicable Diseases was the 144,1±20,7 (min-max=34–170), "perception towards general protection methods" sub-dimension score was 112±16,1 (min-max=26–130), and the "perception towards contagion" sub-dimension score was 32,1±5,6 (min-max=8–40). These findings indicate that mothers have a high level of awareness regarding infectious diseases.

Table 2 shows the distribution of descriptive characteristics of the mother and the comparison of scale scores. It was found that educational level significantly affected perception scores ($p<0,05$) and that mothers with a university degree had higher perception levels. In addition, income level and age variables were also found to have a significant effect on scale scores.

Table 3 shows the distribution of mothers' responses to the propositions about vaccination practices. Accordingly, the vast majority of mothers believe that vaccines prevent diseases, but some also state that they are influenced by the opinions of those around them. It has also been found that mothers whose children contracted measles after being vaccinated reported that the disease was milder.

Table 4 shows the distribution of information about the negativity of vaccines. The most common misconceptions were found to be that "vaccines are unnecessary" (17,4%), "they cause autism" (7,3%), and "they spread disease" (5,1%). These findings show that misinformation plays a significant role in vaccine hesitancy.

The comparison of the scale scores with the information on vaccines is shown in Table 5. According to the findings, mothers who received incorrect information had significantly lower scale scores ($p<0,05$).

The comparison of the information on vaccines according to the variables of education, age and number of children is shown in

**Table 1.** Distribution of the mean scores of the perception scale for infectious diseases and its sub-dimensions

| Perception scale for infectious diseases | Items | Mean ± Sd | Min-Max (Med) | Cronbach's alpha |
|---|---|---|---|---|
| 1st sub-dimension | 1–26 (26) | 112±16,1 | 26–130 (115) | 0,96 |
| 2nd sub-dimension | 27–34 (8) | 32,1±5,6 | 8–40 (32) | 0,90 |
| Total score | 1–34 | 144,1±20,7 | 34–170 (146) | 0,97 |

Sd: Standard deviation; Min: Minimum; Max: Maximum; Med: Median; 1st sub-dimension: Perception towards general protection methods; 2nd Sub-dimension: Perception towards infection.

**Table 2.** Distribution of descriptive family characteristics and comparison with the perception scale for infectious diseases score (N=403)

| Characteristics | | Mean ± Sd | Min-Max (Med) | +PSID^p |
|---|---|---|---|---|
| **Age** | | 32,3±6,2 | 21–50 (31) | 0,572* |
| | | **n** | **%** | |
| **Child number**[+] | 1 child | 201 | 49,9 | 0,123* |
| | 2 children | 137 | 34,0 | |
| | 3 children and above | 65 | 16,1 | |
| **Mother's education level** | Primary school[a] | 68 | 16,9 | 0,000* c >a a >b b >d |
| | High school[b] | 109 | 27,0 | |
| | Undergraduate[c] | 182 | 45,2 | |
| | Graduated[d] | 44 | 10,9 | |
| **Mother's employment status** | Working | 143 | 35,5 | 0,153** |
| | Not working | 260 | 64,5 | |
| **Presence of chronic disease in the family** | Yes | 152 | 37,7 | 0,104** |
| | No | 251 | 62,3 | |
| **Presence of a person diagnosed with autism in the family** | Yes | 17 | 4,2 | 0,275** |
| | No | 386 | 95,8 | |
| **Person with autism in the family** | No one diagnosed with autism[a] | 386 | 95,8 | 0,005* d >b |
| | Own child[b] | 5 | 1,2 | |
| | Brother[c] | 1 | 0,2 | |
| | Relative[d] | 11 | 2.7 | |
| **Total** | | 403 | 100 | |

Sd: standard deviation; Min: minimum; max: maximum; Med: median; *Kruskal-Wallis test; ***Mann-Whitney U test; post hoc: Tamhane's T2, Bonferroni; p<0.05.
+ Only 1 family was found to have a fifth child who was 25 years old.
+PSID: perception scale for infectious diseases.

**Table 3.** Distribution of mothers' responses to propositions related to vaccination practices

| Characteristics | | n | % |
|---|---|---|---|
| Did you choose to vaccinate your children? | Yes | 355 | 88,1 |
| | No | 48 | 11,9 |
| Did you vaccinate your children because it was compulsory? | Yes | 181 | 44,9 |
| | No | 222 | 55,1 |
| Do you think children are vaccinated more often than necessary? | Yes | 122 | 30,3 |
| | No | 281 | 69,7 |
| Do you trust your knowledge about vaccines? | Yes | 290 | 72,0 |
| | No | 113 | 28,0 |
| Have your children had any symptoms of illness/disease after vaccination? | Yes | 37 | 9,2 |
| | No | 366 | 90,8 |
| Symptoms of illness/disease in your children after vaccination | Did not happen | 366 | 90,8 |
| | Fever | 29 | 7,2 |
| | Weakened immune system | 2 | 0,5 |
| | Diarrhea | 1 | 0,2 |
| | Fatigue | 1 | 0,2 |
| | Irritability | 1 | 0,2 |
| | Autism | 3 | 0,7 |
| Is there an increased risk of developing autism after vaccination? | Yes | 55 | 13,6 |
| | No | 348 | 86,4 |
| Do you have concerns about vaccines? | Yes | 173 | 42,9 |
| | No | 230 | 57,1 |
| Who do you consult if you have concerns about vaccines* | Doctor | 335 | 76,1 |
| | Nurse | 22 | 5,0 |
| | Midwife | 17 | 3,9 |
| | Health professional | 16 | 3,6 |
| | Relative | 4 | 0,9 |
| | Familiar | 11 | 2,5 |
| | Research | 11 | 2,5 |
| | Internet | 10 | 2,3 |
| | There's no one I trust | 14 | 3,2 |
| Are you influenced by the opinions of others around you about vaccination? | Yes | 130 | 32,3 |
| | No | 273 | 67,7 |
| Is there enough information about vaccines? | Yes | 110 | 27,3 |
| | No | 293 | 72,7 |
| Do you recommend that people around you vaccinate their children? | Yes | 331 | 82,1 |
| | No | 72 | 17,9 |
| Do you think the vaccination program in your country is safe and effective? | Yes | 264 | 65,5 |
| | No | 139 | 34,5 |
| Are you familiar with vaccines and their contents? | Yes | 279 | 69,2 |
| | No | 124 | 30,8 |
| From whom did you receive information about vaccines and their contents? | Internet/media | 63 | 15,6 |
| | Midwife/doctor/nurse | 223 | 55,3 |
| | Television | 1 | 0,2 |
| | Books | 14 | 3,5 |
| | No information received | 102 | 25,3 |
| No problems experienced | | 368 | 91,3 |
| Problem experienced** | | 35 | 8,7 |
| | **Total** | 403 | 100 |

*Participants marked more than one option.
Problems experienced; 77,1% fever, 8,5% autism and 5,7% weakened immune system.

**Table 4.** Distribution of information on the negatives of vaccines (n=403)

| Characteristics | | n | % |
|---|---|---|---|
| Have you heard any negative information about vaccines? | Yes | 209 | 51,9 |
| | No | 194 | 48,1 |
| What are the negatives you have heard about vaccines? | Allergy | 3 | 0,7 |
| | Autism | 30 | 7,3 |
| | Brain damage | 9 | 2,2 |
| | Chip implantation | 2 | 0,5 |
| | Mercury poisoning | 5 | 1,2 |
| | Paralysis | 2 | 0,5 |
| | High number of side effects | 18 | 4,4 |
| | Not religiously appropriate | 2 | 0,5 |
| | Circulation problems | 1 | 0,2 |
| | No effect, unnecessary | 72 | 17,4 |
| | Developmental problems | 7 | 1,7 |
| | Disease spread pathway | 21 | 5,1 |
| | Genetic/hereditary problems | 10 | 2,4 |
| | Infertility | 8 | 1,9 |
| | Not knowing the context | 4 | 1,0 |
| | Forward-looking issues | 20 | 4,8 |
| | Musculoskeletal problems | 2 | 0,5 |
| | Death | 2 | 0,5 |
| | Cancer | 1 | 0,2 |
| | I heard no negativity | 194 | 47,0 |
| Measles vaccine prevents measles outbreak | True | 313 | 77,7 |
| | False | 90 | 22,3 |
| Do you know what the measles vaccine contains? | Yes | 267 | 66,3 |
| | No | 136 | 33,7 |
| Has your child been vaccinated against measles? | Yes | 363 | 90,1 |
| | No | 40 | 9,9 |
| Has your child ever had measles? | Yes | 50 | 12,4 |
| | No | 353 | 87,6 |
| If measles, how severe were the symptoms? | Soft | 34 | 68 |
| | Medium | 14 | 28 |
| | Severe | 2 | 4 |
| Have your children changed after measles vaccination? | It happened | 41 | 11,3 |
| | Did not happen | 322 | 88,7 |
| Changes that occur after measles vaccination | Physical | 17 | 41,4 |
| | Emotional | 17 | 41,4 |
| | Spiritual | 6 | 14,6 |
| | Social | 1 | 2,6 |

* Participants selected more than one option.

**Table 5.** Comparison of perception scale for infectious diseases scores with knowledge on vaccines

| Characteristics | Perception scale for infectious diseases (*p*) | | |
|---|---|---|---|
| | Total score | 1st sub-dimension | 2nd sub-dimension |
| Are children vaccinated regularly? | 0,004 | 0,003* | 0,082* |
| Did you want to vaccinate your children yourself? | 0,001 | 0,000* | 0,050* |
| Do you vaccinate your children because it is compulsory? | 0,031 | 0,004* | 0,721* |
| Do you think children are vaccinated more than is necessary for them? | 0,001 | 0,000* | 0,612* |
| Are you familiar with vaccines and their contents? | 0,066 | 0,064* | 0,046* |
| If yes, from whom did you get the information? | 0,043** | 0,073** | 0,021** |
| Do you trust the information you receive about vaccines? | 0,119 | 0,061* | 0,199* |
| Have your children had problems/illnesses after vaccination? | 0,741 | 0,924* | 0,491* |
| Does the risk of developing autism increase after vaccination? | 0,004 | 0,002* | 0,111* |
| Do you have any concerns about vaccines? | 0,009 | 0,001* | 0,432* |
| Do the opinions of others around you about vaccines affect your opinion? | 0,489 | 0,438* | 0,969* |
| Do you think you are adequately informed about vaccines? | 0,201 | 0,115* | 0,775* |
| Have you heard any negative information about vaccines? | 0,406 | 0,153* | 0,413* |
| Do you recommend vaccination for children around you? | 0,000 | 0,000* | 0,032* |
| Do you think the vaccination program in Türkiye is safe and effective? | 0,001 | 0,001* | 0,015* |
| Has your child been vaccinated against measles? | 0,071* | 0,135* | 0,036* |
| Has your child ever had measles? | 0,056* | 0,041* | 0,197* |
| If your child had measles, to what extent? | 0,262** | 0,162** | 0,928** |
| Measles contains attenuated live virus | 0,052* | 0,067* | 0,067* |
| Measles vaccine prevents measles outbreak | 0,061* | 0,061* | 0,094* |
| I know what the measles vaccine contains | 0,002* | 0,002* | 0,003* |
| Have your children changed after vaccination? | 0,041* | 0,007* | 0,911* |
| Which change happened after vaccination? | 0,096** | 0,160** | 0,211** |

*Mann-Whitney U Test; **Kruskal-Wallis test; p<0.05
Subdimension 1:Sub-dimension of perception towards general protection methods; Sub-dimension 2:Sub-dimension of perception towards infection

**Table 6.** Comparison of vaccine-related information according to education, age and number of children

| Characteristics | Variables (*p*) | | |
|---|---|---|---|
| | Mother's age | Mother's education level | Number of children |
| Are children vaccinated regularly? | 0,000* | 0,463** | 0,316* |
| Did you want to vaccinate your children yourself? | 0,000* | 0,173** | 0,650* |
| Do you vaccinate your children because it is compulsory? | 0,041* | 0,000** | 0,094* |
| Do you think children are vaccinated more than is necessary for them? | 0,000* | 0,266** | 0,546* |
| Are you familiar with vaccines and their contents? | 0,000* | 0,000** | 0,145* |
| If yes, from whom did you get the information? | 0,000* | 0,004** | 0,489* |
| Do you trust the information you receive about vaccines? | 0,000* | 0,414** | 0,572* |
| Is there an increased risk of developing autism after vaccination? | 0,000* | 0,008** | 0,659* |
| Do you have any concerns about vaccines? | 0,005* | 0,654** | 0,695* |
| Do you recommend vaccination for children around you? | 0,000* | 0,063** | 0,053* |
| Do you think the vaccination program in our country is safe and effective? | 0,000* | 0,174** | 0,226* |
| Measles contains attenuated live virus | 0,000* | 0,000** | 0,009* |
| Measles vaccine prevents measles outbreak | 0,000* | 0,461** | 0,674* |
| I know what the measles vaccine contains | 0,000* | 0,013** | 0,685* |

* Chi-squared test; **Kruskal-Wallis test; p<0.05

Table 6. Accordingly, it has been observed that as the level of education increases, the rate of possessing accurate information rises, and that the level of knowledge is more variable among mothers with more than one child.

## Discussion

Measles is a highly contagious infectious disease that can be prevented by vaccination (29). This study investigated attitudes toward the measles vaccine and influencing factors among mothers, who are the primary target group for vaccination, with an average age of 32.3 years. The findings revealed that although the majority of mothers voluntarily had their children vaccinated, approximately half of them also had concerns about vaccines.

Common misconceptions about vaccines often present barriers to vaccination (30). One of the most significant findings of the study is that more than half of the mothers reported hearing negative information about vaccines. Among the things they heard, the most common responses were that vaccines are unnecessary, vaccines cause autism, and vaccines are a way of spreading disease. Similar studies also support these findings. For example, in a study, it was determined that anti-vaccine views were widespread on social media and that this increased parents' hesitancy to vaccinate (31). At the same time, other study showed that parents' doubts about vaccines were related to their inability to receive adequate information from healthcare professionals (32).

The most important barrier to the spread of measles is the administration of the measles vaccine (33,34). This indicates the importance of the vaccine. According to the findings, more than three-quarters of mothers agreed that measles vaccine prevents outbreaks, while 22,3% had misconceptions. This rate indicates that there is still a lack of knowledge about the effectiveness of the vaccine in the community. Measles is a disease that can spread rapidly among unvaccinated individuals due to its high contagiousness, and according to WHO data, epidemic risks increase when vaccination rates decrease (26). Therefore, maintaining high vaccination rates is essential to ensure community immunity.

The perception of infectious diseases actually lies at the heart of the perception of vaccines. Even when the effects and complications of infectious diseases are known, unexpected problems can sometimes arise when children are involved (26,35). As these is not known, it is not surprising that there is no information about the vaccines that prevent or mildly overcome them. In this study, mothers scored high on the "Perceptions About Infectious Diseases Scale," indicating that their perception of infectious diseases was also high. The findings show that individuals with higher perceptions of infectious diseases are more supportive of vaccination. For example, mothers who preferred to voluntarily vaccinate their children had statistically higher scale scores than mothers who believed vaccination programs were reliable and effective. Similarly, in the other study found that individuals' awareness of infectious disease risk was directly related to vaccine acceptance (36). These findings support that awareness of diseases has a positive effect on vaccine acceptance.

Lack of information about vaccines can cause concerns. Lack of misinformation may even lead to vaccine refusal. In this study, the majority of mothers stated that they were not sufficiently informed about vaccines. Similarly, other study reported that vaccine hesitancy in the community is largely related to lack of information and loss of trust (37). This indicates that more effective communication strategies should be used to address parents' concerns about vaccines (31). Based on the findings, this problem can be eliminated by determining the lack of misinformation and providing information accordingly.

It is important to get vaccine information from the right source (37). The fact that the source of information is an expert in vaccines is essential for the transfer and dissemination of accurate information (37). Accurate vaccination information helps to increase vaccination rates and eliminate diseases. Furthermore, when examining sources of information about vaccines, it was determined that more than half of mothers obtained information from healthcare professionals, while very few obtained information from internet and media sources. Similarly, in a study, it was reported that misinformation obtained by parents over the internet increased vaccine hesitancy (38). In addition, Torun and Ertuğrul (2022) found that parents' level of trust in healthcare professionals directly affects vaccine acceptance and that a decrease in this trust increases vaccine refusal (39). Based on the findings, it can be said that accurate vaccine information from the right source will increase confidence in vaccines, increase vaccination rates and eliminate communicable diseases.

Immunization policies followed by countries are important in relation to vaccination (38,40). It is undeniable that countries play an active role in access to vaccines, vaccination and accurate transmission of vaccine information. In the study, more than half of the mothers reported that the vaccination program in Türkiye is safe and effective. This rate indicates that confidence in vaccination is largely maintained, but certain concerns still exist. World Health Organization also reported that confidence in vaccination programs at the global level varies from country to country and that vaccine hesitancy increases in individuals exposed to misinformation (26). This information again shows the importance of countries' health policies. And considering that communicable diseases can cause not only endemics but also pandemics, each country needs to adopt and implement the right health policies.

All vaccines, including measles vaccine, are of great importance in terms of preventing the spread of the disease and ensuring community immunity. Although mothers generally have a positive attitude towards measles vaccination, it is seen that the factors that cause hesitation are mainly due to lack of information and misconceptions. High perception of communicable diseases emerges as an important factor on vaccine acceptance. The findings of the study show that confidence in the effectiveness of vaccination programs is generally high, but parents need more information about vaccine contents and possible side effects. These findings are directly related to the United Nations' Sustainable Development Goals 'Health and Quality of Life' (Goal 3) and 'Quality Education' (Goal 4), as they are critical to protecting public health and increasing health literacy.

### Limitations and strengths of the study

In this study, the fact that some mothers' children's vaccination ages did not fully correspond led to responses being based on memory, which limited the accuracy of the data. Other limitations of the study include the collection of data using a self-report scale and the cross-sectional design of the study, which does not allow for causal inferences between variables. The strengths of the study include the large sample size and the use of a scale with high internal consistency, which increased the validity and reliability of the findings. The fact that the study is one of the few investigations examining mothers' attitudes toward the measles vaccine in Türkiye with current data contributes significantly to the literature.

## Conclusion

In conclusion, the study revealed that the majority of mothers tend to vaccinate their children, but lack of information and misconceptions increase vaccine hesitancy. Incorrect information that the measles vaccine is unnecessary or causes autism plays a decisive role in parental decisions. It was also found that mothers with a high perception of infectious diseases have a more positive attitude towards vaccines.

The measles vaccine is critical for maintaining public immunity, and reducing misinformation and strengthening parents' access to accurate information are essential requirements for increasing vaccine acceptance. To reduce vaccine hesitancy, healthcare professionals must provide parents with regular, evidence-based information. Furthermore, strengthening digital content verification processes, increasing social media monitoring, and activating reporting and monitoring mechanisms for false information are important to limit the spread of misinformation online. Increasing parental awareness can be supported through community-based educational activities, short informational campaigns, and structured information sessions in primary health care settings.

**Ethical Considerations:** This study was approved by the Istinye University Human Research Ethics Committee with the decision dated 18.04.2024 and numbered 5/33

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**Data Availability Statement:** All relevant data are within the paper and they are available from the corresponding author on reasonable request.

**Author Contributions:** Concept – ANS, AS; Supervision – ANS, AS, BH; Materials – ANS, AS; Data Collection and/or Processing – ANS, AS; Analysis and/or Interpretation – ANS, AS; Writing – ANS, AS

## References

1. Bhutta AZ, Saeed MA. Childhood infectious diseases: overview. International Encyclopedia of Public Health. 2008;620–640. https://doi.org/10.1016/B978-012373960-5.00568-2
2. Misin A, Antonello RM, Di Bella S, Campisciano G, Zanotta N, Giacobbe DR, et al. Measles: an overview of a re-emerging disease in children and immunocompromised patients. Microorganisms. 2020;8(2):276. https://doi.org/10.3390/microorganisms8020276
3. Turkkan ON, Onal ZE, Sas C, Akici N, Gurbuz T, Nuhoglu C. Evaluation of measles cases considering demographic features, disease morbidity and mortality. Haydarpasa Numune Med J. 2017;57(2):83–88. https://doi.org/10.14744/hnhj.2017.66376

4. Kahraman S, Kaplan F. Reasons for increase in recent years of measles disease in Turkey. Bandırma Onyedi Eylül University J Health Sci Res. 2020;2(3):175–183. https://doi.org/10.46413/boneyusbad.757720
5. Karabey M, Karabulut N, Alacam S, Gunduz A, Caymaz C, Altuntas Aydin O. Increase in measles cases in a city hospital, Istanbul, Turkey. Cent Eur J Public Health. 2024;32(2):125–131. https://doi.org/10.21101/cejph.a7981
6. Caliskan D, Piyal B, Akdur R, Ocaktan ME, Yozgatligil C. An analysis of the incidence of measles in Turkey since 1960. Turk J Med Sci. 2016;46(4):1101–1106. https://doi.org/10.3906/sag-1503-62
7. Bulbul B, Hacimustafaoglu M. Measles Infection and Prevention. Klinik Tıp Pediatri Derg. 2020;12(1):5–12. https://dergipark.org.tr/tr/pub/ktpd/issue/59848/864964
8. World Health Organization (WHO). European Region reports highest number of measles cases in more than 25 years - UNICEF, WHO/Europe; 2025. https://www.who.int/europe/news/item/13-03-2025-european-region-reports-highest-number-of-measles-cases-in-more-than-25-years---unicef--who-europe#:~:text=According%20to%20an%20analysis%20by, the%20highest%20number%20since%201997
9. Gambrell A, Sundaram M, Bednarczyk RA. Estimating the number of US children susceptible to measles resulting from COVID-19-related vaccination coverage declines. Vaccine. 2022;40(32):4574–4579. https://doi.org/10.1016/j.vaccine.2022.06.033
10. Hayman DTS. Measles vaccination in an increasingly immunized and developed world. Hum Vaccin Immunother. 2019;15(1):28–33. https://doi.org/10.1080/21645515.2018.1517074
11. Hviid A, Hansen JV, Frisch M, Melbye M. Measles, mumps, rubella vaccination and autism: a nationwide cohort study. Ann Intern Med. 2019;170(8):513-520. https://doi.org/10.7326/M18-2101
12. Rao TS, Andrade C. The MMR vaccine and autism: sensation, refutation, retraction, and fraud. Indian J Psychiatry. 2011;53(2):95–96. https://doi.org/10.4103/0019-5545.82529
13. Gabis LV, Attia OL, Goldman M. Barak N, Tefera P, Shefer S, Shaham M, Lerman-Sagie T. The myth of vaccination and autism spectrum. Eur J Paediatr Neurol. 2022;36:151–158. https://doi.org/10.1016/j.ejpn.2021.12.011
14. Nalbantoglu B, Gokcay EG. Indirect benefits of vaccines. Namik Kemal Med J. 2020;8(2):102–106. https://doi.org/10.37696/nkmj.715738
15. Yapici G, Tunc AT. Evaluation of elimination and eradication programs for vaccine preventable diseases in Turkey. Lokman Hekim Journal. 2019;9(2):171–183. https://doi.org/10.31020/mutftd.552075
16. Kimotho SG. Role of risk perceptions and vaccine hesitancy on decision-making among low-income mothers in Kenya: a qualitative study. BMJ Public Health,. 2025;3:e001601. https://doi.org/10.1136/bmjph-2024-001601
17. Dubé E, Ward JK, Verger P, MacDonald NE. Vaccine Hesitancy, Acceptance, and Anti-Vaccination: Trends and Future Prospects for Public Health. Annu. Rev. Public Health. 2021;42:175-191. https://doi.org/10.1146/annurev-publhealth-090419-102240
18. Giannakou K, Kyprianidou M, Hadjikou A, Fakonti G, Photiou G, Tzira E, et al. Knowledge of mothers regarding children's vaccinations in Greece: an online cross-sectional study. BMC Public Health. 2021;21:2119. https://doi.org/10.1186/s12889-021-12179-5
19. Craig L, Mullan K. How mothers and fathers share childcare: a cross-national time-use comparison. Am Sociol Rev. 2011;76:834–861. https://doi.org/10.1177/0003122411427673
20. Serdar CC, Cihan M, Yücel D, Serdar MA. Sample size, power and effect size revisited: simplified and practical approaches in pre-clinical, clinical and laboratory studies. Biochem Med (Zagreb). 2021;31(1):010502. https://doi.org/10.11613/BM.2021.010502
21. Stratton SJ. Population research: convenience sampling strategies. Prehosp Disaster Med. 2021;36(4):373–374. https://doi.org/10.1017/S1049023X21000649
22. Solmon DA, Moulton LH, Ömer SB, Stokley S, Halsey NA. Factors associated with refusal of childhood vaccines among parents of school-aged children: a case-control study. Arch Pediatr Adolesc Med. 2005;159(5):470–476. https://doi.org/10.1001/archpedi.159.5.470
23. Han Yekdeş D, Marangoz B, Eskiocak M. An intervention study for improve information and attitudes family health nurses in a province about immunization and vaccine hesitancy. J Pediatr Inf. 2022;16(3):e145–e152. https://doi.org/10.5578/ced.20229708
24. McKee C, Bohannon K. Exploring the reasons behind parental refusal of vaccines. J Pediatr Pharmacol Ther. 21(2):104-109. https://doi.org/10.5863/1551-6776-21.2.104
25. Demir Gökmen B, Bakan AB, Yildiz GN, Okanli A. Development of the perceptions about infectious diseases scale. J Nurs Meas. 2022;30(4):645–661. https://doi.org/10.1891/JNM-D-21-00003
26. World Health Organization. Ten threats to global health in 2023. Retrieved from https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2023
27. Wiley K, Christou-Ergos M, Degeling C. Childhood vaccine refusal and what to do about it: a systematic review of the ethical literature. BMC Med Ethics. 2023;24(96):1–17. https://doi.org/10.1186/s12910-023-00978-x
28. Beyazgul B, Gunduzalp A. Ignored group in measles disease and immunization: young adults. J Harran Univ Med Fac. 2024;21(1):138–142. https://doi.org/10.35440/hutfd.1450742
29. World Health Organization. Measles. 2024. https://www.who.int/news-room/fact-sheets/detail/measles
30. Evsile S, Celep G, Duran AP, Bahadır A, Memiş K, Davvara M. Evaluation of attitudes and behaviors of families with children aged 0-24 months about childhood vaccines. J Curr Pediatr. 2025;23(2):126–133. https://doi.org/10.4274/jcp.2025.21447
31. Troiano G, Nardi A. Vaccine hesitancy in the era of COVID-19. Public Health. 2021;198:60–65. https://doi.org/10.1016/j.puhe.2021.02.025
32. MacDonald NA; SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: definition, scope and determinants. Vaccine. 2024;33(34):4161–4164. https://doi.org/10.1016/j.vaccine.2015.04.036
33. Storr C, Sanftenberg L, Schelling J, Heininger U, Schneider A. Measles status-barriers to vaccination and strategies for overcoming them. Dtsch Arztebl Int. 2018;115(43):723–730. https://doi.org/10.3238/arztebl.2018.0723
34. Parums DV. A Review of the resurgence of measles, a vaccine-preventable disease, as current concerns contrast with past hopes for measles elimination. Med Sci Monit. 2024;30:e944436. https://doi.org/10.12659/MSM.944436
35. MacDonald NE, Dubé E. Addressing vaccine hesitancy in immunization programs, clinics and practices. Paediatr Child Health. 2018;23(8):559-560. https://doi.org/10.1093/pch/pxy131.
36. Oruç Ö, Yıldırım D, Kocatepe V, Demirkıran İ. Awareness of Infectious Disease Risks and Vaccination Behaviors Among Health Professionals. Clin Exp Health Sci. 2023;13(2):293-298. https://doi.org/10.33808/clinexphealthsci.959620
37. Jones AM, Omer SB, Bednarczyk RA, Halsey NA, Moulton LH, Salmon DA. Parents' source of vaccine information and impact on vaccine attitudes, beliefs, and nonmedical exemptions. Adv Prev Med. 2012;2012:932741. https://doi.org/10.1155/2012/932741
38. Dubé E, Vivion M, MacDonald NE. Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: influence, impact and implications. Expert Rev Vaccines. 2015;14(1):99-117. https://doi.org/10.1586/14760584.2015.964212.
39. Torun EG, Ertuğrul A. Parental Attitudes and Knowledge Towards Childhood Vaccination. J Pediatr Inf 2022;16(1):e35-e40. https://doi.org/10.5578/ced.20229905
40. Farina S, Maio A, Gualano MR, Ricciardi W, Villani L. Childhood mandatory vaccinations: current situation in European countries and changes occurred from 2014 to 2024. Vaccines (Basel). 2024;12(11):1296. https://doi.org/10.3390/vaccines12111296