Review/*Derleme*

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An Overview of Studies on Parental Attitudes towards Vaccination in Türkiye

Türkiye'de Ebeveynlerin Aşıya İlişkin Tutumları Üzerine Yapılan Çalışmalara Toplu Bakış

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Abstract

Objective: Vaccination is an important method for preventing infectious diseases and has significantly reduced child mortality worldwide through the Expanded Immunization Program since 1974. Türkiye started implementing this program in 1981, achieving high vaccination rates and strengthening herd immunity. However, vaccine hesitancy and refusal pose a risk to public health. This study aims to examine the attitudes of parents in Türkiye towards vaccination and the factors influencing these attitudes between 2017 and 2024.

Material and Methods: A literature review was conducted using databases such as PubMed, Medline, ScienceDirect, Scopus, and Google Scholar with keywords "parents", "childhood vaccines", "parental attitude", "vaccine refusal", "vaccination schedule" and "vaccine hesitancy".

Results: The studies indicate that vaccine hesitancy rates increased during the pandemic, with social media playing a significant role. Furthermore, the dissemination of non-scientific information through digital sources contributes to vaccine hesitancy among parents.

Conclusion: Attitudes towards vaccination are influenced by health literacy, sociodemographic characteristics, information sources, and factors such as the COVID-19 pandemic.

Keywords: Parents, childhood vaccines, parental attitude, vaccine refusal, vaccine hesitancy

Öz

Giriş: Aşılama, bulaşıcı hastalıklardan korunmada önemli bir yöntem olup 1974 yılından itibaren Genişletilmiş Bağışıklama Programı ile dünya genelinde çocuk ölümlerinin büyük oranda önüne geçilmiştir. Türkiye, bu programı 1981 yılından itibaren uygulamaya başlamış ve yüksek aşılama oranlarıyla toplumsal bağışıklığı güçlendirmiştir. Ancak aşıya yönelik tereddüt ve reddetme, toplum sağlığı açısından risk oluşturmaktadır. Bu çalışmanın amacı, 2017-2024 yılları arasında Türkiye'deki ebeveynlerin aşıya yönelik tutumlarını ve bu tutumları etkileyen faktörleri incelemektir.

Gereç ve Yöntemler: Literatür taraması yöntemi kullanılarak, PubMed, Medline, ScienceDirect, Scopus ve Google Akademik gibi veri tabanlarında "ebeveyn", "çocukluk çağı aşıları", "ebeveyn tutumu", "aşı reddi", "aşı takvimi" ve "aşı tereddütü" anahtar kelimeleriyle aramalar yapılmıştır.

Bulgular: Çalışmalarda pandemi döneminde aşı tereddütü oranlarının arttığı ve sosyal medyanın bu konuda önemli bir rol oynadığı belirlenmiştir. Ayrıca, ebeveynlerin dijital kaynaklardan edindikleri bilimsel olmayan bilgiler aşı tereddütüne katkı sağlamaktadır.

Sonuç: Aşıya yönelik tutumlar, sağlık okuryazarlığından, sosyodemografik özelliklerden, bilgi kaynaklarından ve COVID-19 pandemisi gibi faktörlerden etkilenmektedir.

Anahtar Kelimeler: Ebeveyn, çocukluk çağı aşıları, ebeveyn tutumu, aşı reddi, aşı tereddütü

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Introduction

Vaccination is the most serious contribution to human health after the use of clean water in the prevention of infectious diseases. Vaccine, as a biological product, is one of the most important inventions of modern medicine (1). With the success of the Expanded Programme on Immunization, especially since 1974, 146 million deaths under five years of age have been prevented worldwide. For every death prevented, an average of 66 healthy life years have been gained. In addition, a 40% reduction in global infant mortality rates has been detected by increasing community immunity (2).

The World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) established the Expanded Programme on Immunization in 1974 (3). Our country started to implement this program as of 198, and by strengthening social immunity with high vaccination rates, great reductions in the incidence of vaccine-preventable diseases and related deaths have been achieved in half a century (4).

When vaccination rates decline, social immunity decreases and demand for healthcare services increases due to infectious vaccine-preventable diseases. As seen in the coronavirus disease-2019 (COVID-19) pandemic, when the risk of transmission increases, there is excessive demand for health services. Increases in vaccination rates lead to social immunity, reducing the transmission rate of diseases and protecting all individuals from the disease (5). Thanks to the positive contribution of immunization services to the health economy, vaccination is an effective way to reduce expenditures for therapeutic services in the future (6,7).

When historical processes of vaccination services are examined, differences in personal opinions such as ambivalence and negative attitudes towards vaccination are observed. In 2019, the WHO identified vaccine hesitancy as a global health threat (8). Vaccine hesitancy is defined as the delay in accepting or refusing vaccination/immunization services for oneself or one's child, despite being able to access them (7,9).

Parents' attitudes towards vaccination are of great importance for public health. Vaccine hesitation or refusal puts not only unvaccinated children at risk, but also the general population. In many articles examining the processes of acceptance, hesitation or refusal of vaccination, many factors such as differences in personal opinion, beliefs and misdirection of beliefs, level of education, level of health literacy, and the environment in which one lives have been identified as influential factors (10-12). For this reason, many region-specific factors may emerge in studies on attitudes (3).

The aim of this study is to contribute to the development of strategies to protect public health and to compile the findings in the literature and to create a descriptive study for future studies by evaluating the factors affecting parents' attitudes towards vaccination in four stages, first before the COVID-19 pandemic, then in the first and last period of the pandemic process and in the post-pandemic period, by analyzing the studies on parents' attitudes towards vaccination in the period between 2017 and 2024, the sample of which is Türkiye.

Materials and Methods

Research Design

The studies on parental attitudes towards childhood vaccinations in Türkiye between January 2017 and January 2024, in which the data were collected and in which parents other than mothers or fathers were not included in the study, were compiled. In studies conducted from the pre-pandemic period until today, attitudes towards vaccination vary from health literacy, sociodemographic characteristics, information sources and factors such as the COVID-19 pandemic. Four different periods were handled in the study as three years before March 2020, when the COVID-19 pandemic started in our country, the first period of the pandemic process until March 2020 and 2022, the last period of the pandemic process from 2022 to the beginning of 2023, and the studies conducted after 2023 accepted as post-pandemic studies.

Place and Time of the Study

Literature review was conducted between February 1 and June 30, 2024.

Population and Sample of the Study

Pubmed, Medline, Sciencedirect, Scopus and Google Scholar search engines yielded 53 studies. However, six of these studies were thesis studies, two were scale development and adaptation studies, six were attitudes towards adult vaccines, five were studies on parental attitudes towards COVID-19 vaccines, one was a literature review, and three were excluded because their data collection date was before January 2017 and the data collection date was uncertain. When parental attitudes towards childhood vaccines in Türkiye were analyzed, articles published in journals were found appropriate for the study to ensure methodological consistency and data quality. On the other hand, since thesis studies may differ between universities, the literature was analyzed with data from 30 studies, aiming to make the sources included in the study more methodologically consistent and comparable.

Data Collection

Articles were reviewed using the keywords "parent" and "childhood vaccines" and "parental attitudes" and "vaccine refusal" and "vaccine" and "vaccine calendar" and "vaccine hesitation" and their English-Turkish translations. Studies with Türkiye as a sample were examined by searching search engines (Figure 1).

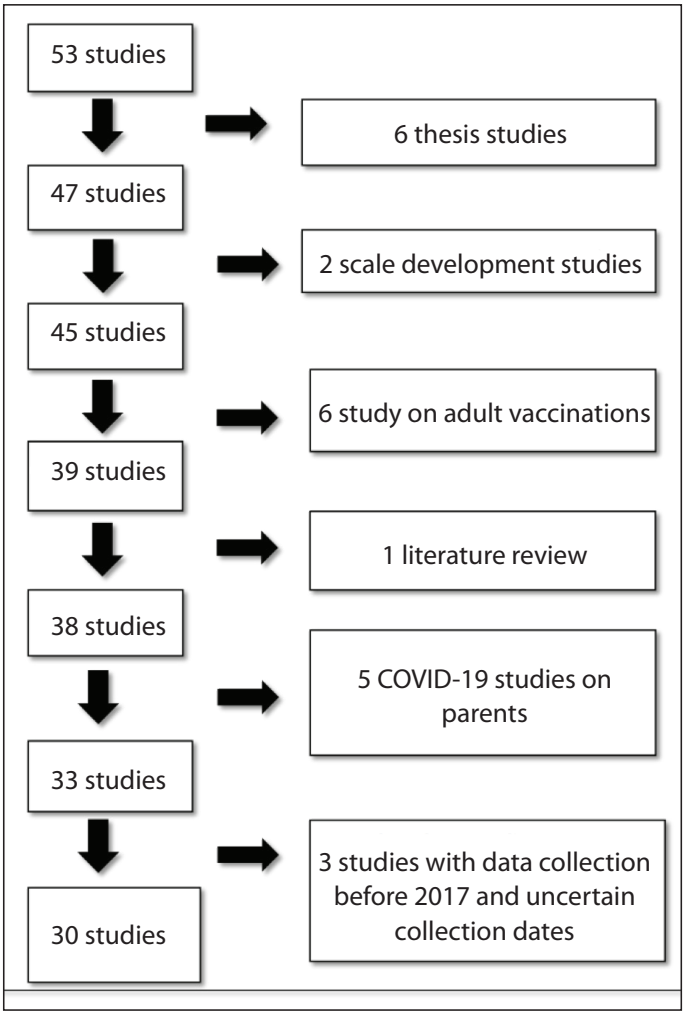

Figure 1. Selection stages of the analyzed publications.

Data Evaluation

Tables were created according to the time of collection of the data of the studies examining parents' attitudes towards vaccination between 2017 and 2024 in Türkiye since the attitude towards vaccination is thought to have changed before, during and after the COVID-19 pandemic. As a result, it was examined whether it affects the attitude towards vaccines in our national childhood vaccination calendar.

Quantitative and qualitative methods were used in the studies. While the measurement tools, statistical methods and results used in the analysis are included in the findings section, data collection years of the studies were taken into consideration during the creation of the table and sorted from the past to present. In addition, the place where the study was conducted, sample selection and number, vaccine hesitancy, vaccine refusal and vaccine confidence rates were evaluated in the tables. The abstracts of the articles included in the tables in this study can be found in the appendix of this article.

Results

Thirty studies were analyzed, 10 of which were pre-pandemic, 13 in the first period of the pandemic, four in the last period of the pandemic and three in the post-pandemic period.

Studies conducted before the pandemic (Table 1): The study of Topçu et al. with 33 parents who refused childhood vaccines in Ankara University and Adıyaman University Social Pediatrics Clinic with children aged 5-60 months and 99 parents who accepted childhood vaccines in the control group. The highest rates were distrust of vaccines (17%), belief that vaccines are dangerous (17%), trust in natural immunity (13%) and belief that vaccines are useless (13%). Among the parents who refused vaccines (33), 10 refused some vaccines and 23 refused all vaccines. The source of information for vaccine refusers was health professionals at a rate of 13% and social media at the same rate. In addition, people around them (36.3%), newspapers/magazines (27.3%) and scientific publications (21.2%) were also listed. The main reasons for rejection were possible side effects, autism and infertility claims. According to the authors, this is the first study in Türkiye on parental refusal of at least one vaccine and sociodemographic characteristics (13).

Argın et al. conducted their study in Kahramanmaraş province. No sample selection was made in the neighborhood determined for the study. The study group consisted of 110 parents (66.4% mothers and 33.6% fathers) who stated that they had children of vaccination age. Significance was found between socioeconomic income levels of the families and side effects of the vaccines. It was also observed that the higher the income level, the higher the level of knowledge. Of the parents, 67.3% think that vaccines have side effects. Healthcare professionals have a large proportion as a source of information about vaccines. However, mass media also has a high rate. It was determined that 58.6% wanted to have their children administer the vaccines included in the national vaccination calendar, 21.8% did not want to, and 19.6% were undecided (14).

In their study, Yelda Özer et al. included 61 parents who were vaccine refusers for childhood vaccines in 2017-2018 in the central districts of Adana province and 148 parents who had their children vaccinated as a control group. In addition, 80.3% had vaccinated their children at least once before. Therefore, the number of families who refused vaccination according to the WHO definition is 19.7%. Of the parents who refused the vaccine, 96.7% had concerns such as vaccine side effects/lack of trust. The rate of being negatively affected by the media is 86.9%. Of the parents in the control group, 27.4% stated that the negative news they came across in the media about vaccination could affect their decisions (15).

Table 1. Studies conducted in the pre-pandemic period

Article	Study Period	Place of Study	Participant Information Where the Study was Conducted	Number of Participants (Included in Analysis)	Results of the Study
Evaluation of childhood vaccine refusal and hesitancy intentions in Türkiye (13).	November-December 2017	Ankara University and Adıyaman University Social Pediatrics Clinic	Study group; those who refused vaccines Control group; those accepting childhood vaccinations; parents with children aged 5-60 months	Study group; 33 Control group; 99	• Vaccine distrust rate is 17%, • Vaccination is dangerous 17 • Reliance on natural immunity 13%, • 13% believe that vaccination is useless, • Among the parents who refused vaccines (33), 10 refused some vaccines and 23 refused all vaccines.
Ebeveynlerin çocuklarına aşı uygulanmasına karşı düşünce ve tutumları: Kahramanmaraş örneği (14).	May-June 2018	East Kent neighborhood of Kahramanmaraş Dulkadiroğlu district	Parents residing in the neighborhood	110	Have their children receive the vaccines included in the national vaccination calendar • 58.6% wanted, • 21.8% did not want to, • 19.6% were undecided.
Aşı reddi nedenleri ve aşılar hakkındaki görüşler (15).	2017-2018	In the central districts of Adana province	Study group; refusing vaccines Parents whose children were vaccinated as the Control group	Study group; 61 Control group; 148	Parents who refuse vaccination; • 96.7% had concerns about vaccine side effects/ lack of trust.
I'm a mother, therefore I question: Parents' legitimation sources of and hesitancy towards early childhood vaccination (16).	2019	Ankara	Mothers with children aged 0-5 who refuse to vaccinate their children	23	
Knowledge, behavior and attitude of mother's about childhood immunization and reasons of vaccination rejection and hesitancy: A study of mixt methodology (17).	August 2018-May 2019	Four FHCs in the central districts of Hatay province	Mothers who applied to the FHC for any reason were the Control group Mothers who randomly participated in the study with qualitative research method were the Study group.	Control group; 350 Study group; 25	Completion rate of childhood vaccinations; • Yes; 97.43%, • No; 2.57%, • 98% of mothers stated that vaccinations were necessary.
Ebeveynlerin sağlık okuryazarlığı düzeyinin çocukluk dönemi aşılarına yönelik tutum ve davranışlarıyla ilişkisi (18).	January 11-31, 2019	Central district of Kırıkkale province	Parents with a 0-12-month-old baby	279	• 98.6% of parents vaccinated their children, • 95.3% stated that vaccination was necessary.
Investigation of knowledge, attitude and behaviours of parents refusing childhood vaccines in Malatya, an eastern city of Türkiye (19).	September-November 2019	Malatya province	Parents who refuse childhood vaccinations	151	
Determining the relationship of parents' knowledge and attitudes and health literacy about the admission or refusal of childhood immunization (20).	November 15, 2019-January 15, 2020	Adana Çukurova University Hospital	Parents of pediatric patients aged 0-5 years admitted to the pediatric health and diseases outpatient clinic and pediatric infection outpatient clinic/service	220	• 95.9% of mothers think that vaccines are necessary.
Vaccine rejection for parents with babies of 0-24 months: Solution recommendations for causes and reduction (21).	November 2019-May 2020	Two FHCs and one private hospital in Konya	Mothers who refused vaccination using typical case sampling	20	
Ebeveynlerin aşı tereddüt düzeylerinin ve karşıtlık nedenlerinin incelenmesi (22).	January - February 2020	İstanbul; Health centers in Esenyurt, Bağcılar, Başakşehir, Küçükçekmece districts	Control group; parents with children aged 0-5 years and based on the survey research; Study group; parents who refuse vaccination	Control group; 276 Study group; 25	

In the study by Çelik et al. the authors included 23 mothers with children aged 0-5 years living in Ankara who refused vaccination of their children in 2019. Attitudes such as the fact that the uniform vaccine is applied to all children in accordance with the health policy of our country, the fact that digital research on its content consists of misinformation, the content is not considered appropriate in religious terms, the tendency towards natural ingredients with the idea that the vaccine does not provide 100% protection, and distrust in the pharmaceutical sector were identified (16).

In Hatay, 350 mothers participated in the study by Çıklar and Güner. Of the mothers, 98% stated that vaccines are necessary. The reasons for the necessity of vaccination were stated as "creates resistance against microbes" by 36.15% and "protects against disease" by 47.52%, respectively. When the damages that can be seen in the child if vaccines are not administered were evaluated, 30% stated that their children would get sick frequently and 26.57% stated that they would get sick very quickly. Regarding the question when the first vaccine was given to a newborn baby, 65.43% of the mothers answered at birth. Lack of knowledge about paid vaccines (60.57%) was identified. Flu vaccine (33.33%) and rotavirus vaccine (24.64%) are the best-known paid vaccines (17).

Ertuğrul and Albayrak conducted their study in Kırıkkale province and 279 parents with 0-12-month-old infants participated in the sample with the lot quality technique. Mean health literacy (HLS) score of the parents was 30.57 ± 8.30, 62.8% had inadequate and problematic-limited overall HLS level, 98.6% of them had their children vaccinated, 74.6% of them made decisions about the health and vaccination status of their babies together with their spouses, 75.3% of the parents received information about vaccines from a doctor, and 56.3% from a midwife, 3% received information about vaccines from the doctor and 56.3% from the midwife/nurse. 93.2% stated that their babies were vaccinated at the family medicine center and 61.6% stated that their babies did not experience any side effects after vaccination. More than half of the parents (57.7%) stated that routine vaccinations could be postponed in case of illness, while 38% stated that they could be postponed in case of fever. 98.6% of the parents stated that their children were vaccinated, and 95.3% stated that vaccination was necessary. When the opinion on mandatory vaccination programs is examined, 81.4% think that vaccination should be mandatory (18).

Gökçe et al. conducted a study in Malatya province and 151 parents who refused vaccines participated. 91% of the participants refused vaccines due to the side effects of the vaccines, and 93% did not find the information provided by health personnel about vaccines sufficient. 95.4% stated that they received information from television, while 71% stated that it caused infertility (19).

Yıldızeli et al. conducted their study in Adana province and included a total of 220 mothers with children aged 0-5 years who applied to the pediatric outpatient clinic of the hospital. 95.9% of the mothers thought that vaccinations were necessary and had a high level of health literacy. A statistically significant difference was found between the mean total scores of the health literacy scale and education status, employment status, social security status, number of children and paid vaccination status of their children. Mothers who had paid vaccination for their children had higher mean total health literacy scores (20).

Atasever et al. conducted their study in two family health centers (FHC) and one private hospital in Konya province. Twenty mothers who refused childhood vaccinations participated in the study. Mothers did not know about immunization. In addition, breast milk and propolis ranked first among traditional/alternative treatment methods. It was determined that mothers also used herbal products and spiritual practices. They were opposed to the vaccine because it was not produced in our country, and beliefs such as that it causes autism, that it contains harmful substances, and that the vaccinated child gets sick more often emerged (21).

Aygün and Tortop conducted their study in İstanbul. According to the results obtained with the "Vaccine Hesitation Scale" for 276 parents with children aged 0-5 years, eight themes emerged as the reasons for refusal with a semi-structured interview form with 25 parents who refused vaccination. They stated that the rate of "hesitation about vaccination" was 72%, the rate of "social media being ineffective in their decisions about the vaccines" was 68%, the rate of "religious objectionability of the vaccines" was 64%, the rate of "the fact that the source and content of the disease" was harmful was 72%, the rate of "vaccines were useless" was 64%, the rate of "there was not enough information about vaccines" was 56% and "infectious diseases were not dangerous" was 52% (22).

Studies conducted in the first period of the pandemic (Table 2): Yüksel and Kara Uzun conducted their study in Ankara province and 133 parents with children in the age range of the national childhood vaccination calendar participated in the study. 97.7% of them stated that vaccination was a necessary practice, 93.9% had a complete vaccine for their baby, 47.7% had knowledge about non-routine vaccines, but 17.4% had non-routine vaccines. The most known non-routine vaccine was the rotavirus vaccine. There was a positive correlation between the level of education and occupation of the mother and non-routine vaccination of her children. No vaccine hesitancy or opposition to vaccination was found in the study (23).

Emlek Sert et al. conducted their study in the streets of Bornova district in İzmir province with the participation of 302 parents with children aged 0-5 years. While 97.7% of the

Table 2. Studies conducted in the first period of the pandemic

Article	Study Period	Place of Study	Participant Information Where the Study was Conducted	Number of Participans (Included in Analysis)	Results of the Study
Ebeveynlerin çocukluk çağı aşıları hakkındaki bilgi, davranış ve tutumları (23).	August-September 2020	Ankara City Hospital Pediatric Hospital Healthy Child Polyclinic	Parents with children within the age range of the national childhood vaccination schedule.	133	• 97.7% said that vaccination is a necessary practice, • 93.9% had a fully immunized baby, • 47.7% had knowledge about non-routine vaccinations, • 17.4% were found to receive non-routine vaccinations.
Knowledge beliefs, and behaviors of Turkish parents about childhood vaccination (24).	Februar-June 2020	Bornova district of İzmir province (street survey)	Parents with children aged 0-5 years.	302	• 97.7% had fully vaccinated their children according to the national vaccination schedule.
Reasons for vaccine rejections and ethical dimension of vaccine rejections: A qualitative research in the case of Gaziosmanpaşa Mustafa Furuncu FHC (25).	March-June 2020	İstanbul Gaziosmanpaşa Mustafa Furuncu FHC	Parents with children aged 0-4 years who do not come for vaccination.	10	
Comparison of opinions and attitudes of parents with vaccine refusal before and during the COVID-19 pandemic (26).	June 24-December 24, 2020	A maternity hospital in İstanbul	Between December 12, 2017 and December 24, 2020, parents who refused to have their child vaccinated against hepatitis B at birth.	Group 1= 20 Group 2= 24	
Factors associated with pediatric vaccine hesitancy of parents: A cross-sectional study in Türkiye (27).	September-December 2020	Sakarya University Training and Research Hospital	Parents with children between the ages of 12 months and 6 years who receive services from the prenatal class.	370	• Vaccine hesitation rate is 13.8%, • The vaccine refusal rate was 4.8%.
Changes in parents' attitudes towards childhood vaccines during COVID-19 pandemic (28).	August 2020 to February 2021	Pediatrics at Trakya University Hospital in Edirne	Parents of children applying to the outpatient clinic.	Group 1= 160 Group 2= 450	Number of parents hesitant about childhood vaccinations; • 17 (10.6%) in Group 1, • 90 (20%) in Group 2.
Ebeveynlerin çocukluk dönemi aşıları ile ilgili bilgi, tutum ve davranışlarının incelenmesi (29).	November 2020-February 2021	In two FHCs in a district center in the Western Black Sea Region	Parents with children aged 0-6 years.	110	• 90.9% vaccinated their children, • 29.1% had at least one specific vaccine, • 85.5% think that vaccines are necessary.
The effect of parents' health literacy level on the attitudes and behaviors of childhood vaccinations (30).	February 15- March 26, 2021	Türkiye	Parents with children aged 0-59 months.	1038	• 42.3% are low, • 33.6% medium, • 24.1% have high vaccine hesitancy.
Annelerin rutin çocukluk çağı aşılarına ilişkin görüşlerinin değerlendirilmesi (31).	June and November 2021	Nevşehir province	Mothers with children aged 0-2 years.	347	• Vaccine hesitation rate was 22.8%.
Knowledge and attitudes of parents with children aged 0-5 with respect to childhood vaccines (32).	June-August 2021	Bursa province FHC	Parents with children aged 0-5 years who applied to family medicine participated.	220	• 90.9% had their children vaccinated in accordance with the national vaccination schedule, • When attitude towards vaccination was analyzed, it was determined that 45.91% had a "positive attitude" and 1.36% had a "negative attitude".

Table 2. Studies conducted in the first period of the pandemic (continue)

Article	Study Period	Place of Study	Participant Information Where the Study was Conducted	Number of Participans (Included in Analysis)	Results of the Study
COVID-19 pandemisinde doğum yapan annelerin çocukluk dönemi aşıları hakkındaki farkındalıkları (33).	May-September 2021		Mothers with healthy babies hospitalized in the postpartum ward of a training and research hospital.	206	
The relation between digital literacy, cyberchondria, and parents' attitudes to childhood vaccines (34).	July-October 2021	Türkiye	582 parents with children aged 3-5 years participated online.		• The vaccine hesitancy rate of parents was 31.3%, • The rate of not trusting vaccines as a reason for not having their children fully vaccinated is 24.5%.
Parents' attitudes toward childhood vaccines and COVID-19 vaccines in a turkish pediatric outpatient population (35).	September-December 2021	In three different cities in Türkiye; Gülhane Training and Research Hospital, Mersin City Training and Research Hospital, Department of Pediatrics and Afyon Çay State Hospital.	Parents of hospitalized children aged 0-5 years	1087	• Vaccine hesitation rate was 9.8%.

parents fully vaccinated their children according to the national vaccination schedule, 2.3% did not vaccinate their children. 98% trusted the information provided by health professionals about vaccination. The study found that although parents' knowledge about vaccines is quite good, there are negative knowledge and beliefs that may affect vaccination (24).

Gültekin and Çağlar called 10 parents of 0-4-year-old children who did not come to İstanbul Gaziosmanpaşa Mustafa Furuncu FHC for vaccination and reminded them of routine vaccinations. It was determined that they lacked information about vaccine content and met their information needs from non-scientifically based content in the digital environment (25).

Korkmaz et al. conducted a study in İstanbul between December 12, 2017 and December 24, 2020 in which 44 parents who refused to have their child vaccinated against hepatitis B at birth participated. When a comparison was made between the parents who refused the vaccine before the pandemic (Group 1= 20) and the parents who refused the vaccine during the pandemic (Group 2= 24), the view that Group 2 also gets infectious diseases was significant compared to Group 1. The opinions of all parents about vaccine refusal did not change during the process. The opinion that vaccines contain harmful substances was significantly higher in both groups. In Group 2, the beliefs that vaccines do not protect against diseases, that they are not necessary and that different diseases develop due to vaccination were statistically significant (26).

Yörük and Güler conducted their study in Sakarya province. A total of 370 parents with children aged 12 months-6 years who received services from the prenatal class of a tertiary hospital in Türkiye participated in the study. Vaccine hesitation was 13.8% and vaccine refusal was 4.8%. Vaccine hesitancy was significantly higher in mothers with university education, who became pregnant with treatment, who did not receive training on pediatric vaccines during prenatal follow-up, who followed anti-vaccine groups on social media, and who followed anti-vaccine groups. The reasons for hesitation were determined as not using regular vitamin D and iron supplements, becoming pregnant with treatment, following anti-vaccine groups on social media and being concerned about the content of the vaccine (27).

Duran et al.'s study consists of two groups in Edirne province. In Group 1, there were 160 parents of children admitted after the first peak of the COVID-19 pandemic, and in Group 2, there were 450 parents of children admitted after the second peak, totaling 610 parents. The number of parents who hesitated to participate in childhood vaccinations was 17 (10.6%) in Group 1 and 90 (20%) in Group 2. There was a statistically significant difference between the two groups. Parents who have experienced COVID-19 or are concerned about the devastating effects of this disease have low hesitant attitudes towards childhood and COVID-19 vaccines. However, as the pandemic progressed, parents' hesitancy towards childhood vaccines increased (28).

In the study of Çay and Göl, 110 parents with children aged 0-6 years participated in the study conducted in the Western Black Sea Region. It was determined that 90.9% of the parents had their children vaccinated, and 29.1% had at least one special vaccine. 85.5% thought that vaccines were necessary. 74.5% think that vaccines have side effects, 8.5% think that autism is a side effect and 6.1% think that infertility is a side effect of vaccines (29).

Dağlı and Topkara included 1038 parents with children aged 0-59 months. Mean PACV score of the parents was 2.33 ± 0.83 and 42.3% had low, 33.6% had moderate and 24.1% had high vaccine hesitancy. Vaccine hesitancy decreased as the parents' level of health literacy increased. Parents who received information about vaccines had higher levels of health literacy than those who did not receive information. This shows that parents tend to obtain more information about vaccines as their health literacy levels increase. 82.1% of parents received information about vaccines and 15.5% received negative information about vaccines. The proportion of parents who received negative opinions about vaccines from health personnel was 8.2% (30).

Akman and Yıldız conducted their study in Nevşehir province with 347 mothers who have children between the ages of 0-2 years participated online with the snowball sampling method. In the study, a moderate level of opposition to vaccination was found. While 45.2% of the mothers reported that they were concerned about vaccine side effects, 22.8% of them were hesitant about vaccination (31).

Torun and Bal Yılmaz conducted their study in Bursa province. A total of 220 parents with children aged 0-5 years who applied to the family doctor's office participated in the study. 77.3% of the parents decided to vaccinate their children together. 90.9% of the parents stated that their children were vaccinated in accordance with the national vaccination schedule. When the reasons for those who did not give permission for vaccination were examined, it was determined that they did not vaccinate their children on the grounds that vaccines are harmful to human health. The higher the income level of the participants, the higher their level of knowledge. When attitude towards vaccination was analyzed, it was determined that 45.91% of the participants had a "positive attitude" and 1.36% had a "negative attitude" (32).

In the study of Ayyıldız and Kolcu, there were 206 mothers with healthy babies hospitalized in the postpartum ward of a training and research hospital. In the questionnaire created as a result of the literature review, the effect of giving birth during the COVID-19 pandemic on attitudes towards childhood vaccines was examined. 53.9% of the mothers stated that giving birth during the COVID-19 pandemic did not affect their attitude towards vaccination. The rate of knowledge about childhood vaccines is low (36.4%). They stated that 72.8% received information about vaccines from nurses (33).

In Üstüner Top et al.'s study, 582 parents with children aged 3-5 years participated online. Vaccine hesitancy rate of the parents was found to be 31.3%. The rate of being affected by anti-vaccine news on social media was 28.3%. The rate of not trusting vaccines as a reason for not fully vaccinating their children was 24.5% (34).

Durmaz et al. conducted research on 1087 parents of 0-5-year-old children hospitalized in three different cities in Türkiye. Parents who are hesitant about childhood vaccinations have a very low attitude towards COVID-19 vaccines and are influenced by social media. Vaccine hesitation rate is 9.8% (35).

Studies conducted in the last period of the pandemic (Table 3): Turan conducted his study in Aksaray province and 259 parents with children aged 0-18 years participated. While 58.71% (n= 150) of the parents had vaccine hesitancy, 79.15% of them reported that the COVID-19 pandemic negatively affected their attitudes towards childhood vaccinations, the most frequently used information sources were acquaintances/friends, and the least frequently used information sources were FHC physicians/nurses (36).

In the study by Mercan et al. 158 parents in Kırklareli participated in the study. Of the participants, 97.5% knew that vaccination was necessary, 73.4% knew that a child with a fever above 38 degrees would not be vaccinated, and 77.2% knew that vaccines had side effects. 94.3% of the parents reported that the agenda they heard about opposition or hesitation to vaccination did not affect them. 98.1% of the study group reported that their last child was vaccinated on time. When analyzed according to the National vaccination calendar, 78.3%-98.7% of the research group stated that their last child was vaccinated on time, 0.7%-8.0% stated that they received their vaccinations even with a delay, and parents stated that they received information from healthcare professionals and online sources (37).

Akgül and Ergün conducted a study in İstanbul and one of the parents (n= 191; 88% mother, 9.9% father, 2.1% other) of primary school students participated. It was found that 24.1% of the parents were hesitant about childhood vaccinations, 12% did not find childhood vaccinations necessary, 2.1% did not vaccinate their first child and 5.3% did not vaccinate their other children, and 7.9% regretted having their children vaccinated before the pandemic period (38).

Kurt et al. conducted their study in Adıyaman province. Between 2014 and 2021, 300 families who refused vaccination participated in the study. At the end of providing general vaccination information to the families, 9.3% of them were convinced about vaccination. Participants who received some vaccines (11.6%) had a higher rate of persuasion

Table 3. Studies conducted in the last period of the pandemic

Article	Study Period	Place of Study	Participant Information Where the Study was Conducted	Number of Participants (Included in Analysis)	Results of the Study
Ulusal aşılama programında yer alan çocukluk çağı aşılarına yönelik ebeveynlerin tutumları: Aksaray örneği (36).	March-September 2022	Aksaray	Parents with children aged 0-18	259	• Vaccine hesitation rate 58.71% (n= 150)
48 ay ve daha küçük çocuğu olan ebeveynlerin çocukluk çağı aşılarına yönelik bilgi, tutum ve davranışlarının incelenmesi (37).	March-June 2022	Kırklareli	Parent	158	97.5% of the participants stated that vaccination is necessary, 98.1% stated that their last child was vaccinated on time. When analyzed for each vaccine according to the National Vaccination Calendar; the research group; • 78.3%-98.7% said that their last child was vaccinated on time, • 0.7%-8.0% had received their vaccinations, albeit with a delay.
Ebeveynlerin çocukluk çağı aşıları ile COVID- 19 aşısına yönelik tutumları arasındaki ilişki (38).	01-30 June 2022	İstanbul	One of the parents of primary school students in İstanbul	191	• 24.1% were hesitant about childhood vaccinations, • 12% did not find childhood vaccinations necessary, • 2.1% did not vaccinate their first child and 5.3% did not vaccinate their other children, • 7.9% regretted having their children vaccinated before the pandemic period.
Childhood vaccine attitude and refusal among Turkish parents (39).	September 1-October 22, 2022	Adıyaman	Families who refused vaccination in 2014-2021	300	

than those who did not receive any vaccines (2.6%). Fathers (17.3%) had a significantly higher rate of persuasion than mothers (7.7%) (39).

Studies conducted after the pandemic (Table 4): Didem et al. conducted their study in Edirne province. Three hundred fifteen parents with preschool-age children participated in the study.

Table 4. Studies conducted after the pandemic

Article	Study Period	Place of Study	Participant Information Where the Study was Conducted	Number of Participants (Included in Analysis)	Results of the Study
The frequency and determinants of vaccine hesitancy among parents of preschool and kindergarten students in Edirne central district (40).	January 15-June 15, 2023	Edirne	Parents with preschool-age children	315	• Vaccine hesitation rate was 13%.
Yor Opinions of parents with 0-24 month old children on vaccination and vaccine rejection during the COVID-19 pandemic: A qualitative research (41).	April-June 2023	Türkiye	Parents with children aged 0-24 months	15	
Understanding parental perspectives on childhood vaccines: Examining attitudes and behaviors of parents with young children (42).	April-June 2023	Türkiye	138 parents with children aged 0-24 months		• 63% have no hesitation about childhood vaccinations, • The number of participants who decided not to vaccinate was 16 (16.33%), while 10 (10%) postponed vaccination, • 69.38% (n= 68) trust the information they receive about vaccines.

The rate of vaccine hesitation was 13%. Factors associated with hesitation were low-income level, religious concerns based on cultural and contextual factors, and negative media narratives (40).

Yorulmaz et al. conducted their study in Türkiye. Fifteen parents with children aged 0-24 months participated in the study. They stated that with vaccination awareness and knowledge level vaccines protected their children from diseases, that they trusted the information they received from healthcare professionals and that this information was effective in their decision to vaccinate. Attitudes towards vaccine refusal: Majority of the parents do not experience hesitation. However, some of them stated that negative news about vaccines on social media affected them. The impact of the COVID-19 pandemic on vaccination was that they postponed their vaccination appointments during this process, and that their concerns decreased thanks to communication with healthcare professionals, and they went to vaccination (41).

Silahlı et al. conducted their study in Türkiye. One hundred and thirty-eight parents with children aged 0-24 months participated in the study. Of the parents, 63% had no hesitation about childhood vaccinations. 73% (n= 72) reported that vaccination was more effective than natural immunization, 16 (16.33%) decided not to vaccinate, while 10 (10%) postponed vaccination. 69.38% (n= 68) trusted the information they received about vaccines and reported that they could openly discuss their concerns about vaccines with health professionals. When asked about the sources of information about childhood vaccinations, 92.78% (n= 90) of the respondents reported receiving information from health professionals. In contrast, 53.61% (n= 52) of the respondents reported using online sources (42).

Discussion

Studies on parents' attitudes towards childhood vaccines between 2017 and 2024, with Türkiye as the sample, were analyzed for this study. Rates of vaccine hesitancy and refusal and the factors affecting them were determined. The findings reveal that parents' attitudes towards vaccination vary and that the COVID-19 pandemic has a significant impact on these attitudes. This suggests that strategies related to vaccine hesitancy and refusal should be re-evaluated. When the studies were examined, most of them were conducted with a quantitative method and were cross-sectional. The prepared questionnaires consisted of questions created after the literature review, forms in which sociodemographic characteristics were examined, and scales whose validity and reliability were analyzed in this field. In the studies conducted with the scale prepared on parents' attitudes towards childhood vaccines, parents' hesitation about vaccination was determined at different rates such as 13%, 24.1%, 58.71% and 13.8% (27,30,36,40). The highest rate of hesitation was 58.71% during the pandemic period and when vaccines received a lot of media coverage. The number of studies conducted after the pandemic is quite low and the hesitation rate for childhood vaccines varies between 13% and 10% (40,42). Derdemezis et al. examined the attitude of parents towards the childhood vaccination program during the COVID-19 pandemic in Greece, and it was found that the possibility of reflection on childhood vaccines was high due to the increase in the rate of hesitation and the increase in skepticism towards vaccines released during the pandemic period (43).

Studies conducted in Türkiye in the pre-pandemic period show that parents are generally less hesitant about vaccination and have more positive views on the necessity of vaccination (17,20). Studies conducted during this period have indicated that rates of vaccine opposition and hesitancy are low, but in some regions, there is still mistrust of the vaccine and concerns about side effects (13,14). Similarly, a study conducted by Dubé et al. in Canada found that parents were generally favorable to vaccination, but hesitant in certain groups (44).

The number of studies conducted in the first period of the pandemic is quite high compared to other periods. When a period-based review is made in the studies during the COVID-19 pandemic process, the reasons for hesitation and opposition are similar in 2021 studies. Korkmaz et al. examined the reasons for refusal in the pre-pandemic period and the reasons for refusal after the pandemic with 44 parents who refused hepatitis B vaccine after birth. No significant differences were found between the groups in the reasons for refusal. In addition, the view that the vaccine is useless was significantly higher among parents who refused the vaccine during the pandemic period (26). Similarly, giving birth during the pandemic did not affect the attitude of mothers towards vaccination (33). However, in the study of Duran et al. a comparison was made in two groups. While the rate of hesitation towards vaccination was low at the beginning of the pandemic process, it was found that the rate of hesitation increased in parents in the following processes (28).

In studies conducted in the last period of the pandemic, the rate of hesitation towards childhood vaccinations started to increase. In studies conducted in 2022, hesitancy towards childhood vaccinations increased and parents who were worried because they had vaccinated their children in the past were identified (36,38,45). In the study conducted for physicians in Ankara during the pandemic period, it was concluded that parents postponed childhood vaccinations but had their children vaccinated (46). However, even if the health literacy rate of parents is high, the rate of administering the COVID-19 vaccine to their children is low (36,45,47). This may be attributed to the fact that parents in Türkiye have been influenced by misinformation and speculation about the vaccine spread in the media during the pandemic.

Ertuğrul and Albayrak examined the effect of health literacy on attitude towards vaccination. Although the health literacy level of the parents was low, 98.6% stated that it was necessary to vaccinate their children (18). In the study by Yıldızeli et al. health literacy level was high and 95.9% stated that vaccination was necessary (20). Dağlı and Topkara found that the rate of hesitation towards vaccination decreased with increasing health literacy level (30). It is predicted that the period will increase sensitivity towards vaccines and low health literacy level may affect the rate of community immunization in the future. In addition, in the study on health literacy and vaccines, the rate of parents vaccinating their children was low (48).

As a source of information, parents primarily mentioned healthcare professionals and then digital content providers such as mass media and social media. It was also concluded that they trusted the knowledge of healthcare professionals and found it sufficient. However, in the study published by Gökçe et al. 93% of the parents stated that they did not find the information they received from healthcare professionals about vaccination sufficient (19). In the study by Ertuğrul and Albayrak, 75.3% of the parents stated that they received information about vaccines from a doctor, 56.3% from a midwife/nurse, and 93.2% stated that their children were vaccinated by family medicine. Since parents also stated mass media as a source of information at a high rate, it should be considered that parents' knowledge about vaccines using digital resources may pose a risk in the future due to unscientific content (14,34). Similar to these studies conducted in Türkiye, it was observed that social media and digital content significantly affected parents' attitudes towards vaccination. Especially during the pandemic period, the increased use of social media and the rapid spread of misinformation about vaccines have increased parents' hesitation about vaccination. In this study, most of the parents stated that the negative content they encountered on social media influenced their decisions. In many studies, the effect of anti-vaccine content on social media on the increase in hesitation rates has been determined. It has been stated that social media is used as a platform for anti-vaccine campaigns and as a result, vaccine hesitation and refusal increase (49,50). In parallel with these studies, the study conducted in Türkiye also found that parents were exposed to misinformation on social media, which undermined their trust in vaccines. In particular, misinformation spread on social media about the side effects and safety of vaccines negatively affects parents' decisions to vaccinate. This may be due to the ease of information retrieval with the increase in content production in digital resources and families' easy access to information regardless of socioeconomic status or education level.

Since the national vaccination schedule established in accordance with the vaccination policy of our country is implemented free of charge by family medicine, which is a primary health care institution, and since this practice is voluntary with the consent of the parents, the first health care provider that the family consults during the hesitation and refusal phase is most likely the family physician and family health worker. Thanks to vaccine communication, the health service provider's correct transmission of the message about vaccination and reassurance affect the parents' decision to vaccinate (51). Healthcare providers who successfully communicate vaccine communication increase trust in vaccines (52). Conversely, parents' vaccine ambivalence may progress to vaccine refusal due to inadequate communication (53). This is an indication that health workers have an important role in the process of vaccine information and administration (18). Yıldızeli et al. reported that mothers with high health literacy rates trusted the information they received from health workers and that the information of health workers was effective in their decision to vaccinate (20). As can be understood from the studies, the vaccine knowledge of healthcare workers can affect the attitude towards vaccination. Therefore, vaccine knowledge and vaccine communication skills of healthcare workers to promote vaccination is an important strategy to combat vaccine hesitancy and vaccine refusal.

In the study by Çay and Göl, it was found that parents evaluated side effects and unscientific claims such as autism and infertility as side effects. In the study, although parents stated that they considered healthcare professionals as a source of information, the presence of misconceptions and misinformation was determined (29). In the studies conducted, parents' preference for health professionals as a source of information is very useful for the correct management of the hesitation process (32). Parents who postponed their children's vaccinations during the pandemic period stated that their hesitation decreased thanks to the communication they established with healthcare professionals (54). Healthcare providers' vaccination knowledge plays a critical role in parents' attitudes towards vaccination. The ability of health care providers to convey accurate and reliable vaccination information has been found to positively influence parents' vaccination decisions (51). Health professionals need to understand parents' concerns about vaccination and provide clear and science-based responses to these concerns.

In the studies, regardless of the date, parents' vaccine hesitancy rates increase due to possible side effects of vaccines, autism and infertility (13,19,21,29). The misleading written materials that emerged in the US in the 1970s, claiming that vaccines cause autism, have been scientifically disproven. However, parents' anti-vaccine rhetoric is still skeptical of vaccines because of the autism response and protective ingredients such as thiomersal (55). The fact that health professionals, who are the defenders and scientific content narrators against autism allegations that have created

controversy on vaccines and autism allegations to date, have not been able to respond correctly at the desired rate, it is necessary to develop vaccine communication strategies to be made in this field and to address the misinformation and myths spread by the society and to explain the correct information through the appropriate channel for the education level and information needs of each parent who hesitates (56-59).

In this context, the Ministry of Health should continue its education and information activities by creating resources for parents. Education campaigns can be organized to provide easy access to reliable information. For this purpose, large masses can be reached through media channels such as radio, television and digital content providers. It is important to continuously update vaccine communication strategies by receiving feedback from various segments of the society. Parents can be trained on vaccine content information and reasons for hesitation. In addition, mobile applications and interactive websites can be developed to access accurate information from digital information sources. These platforms should answer parents' questions and provide up-to-date information with user-friendly interfaces. By creating platforms where parents can share their opinions and experiences on vaccination, mutual exchange of information can be encouraged.

Conclusion

This literature review summarizes and analyzes the findings of various studies conducted in Türkiye by identifying factors affecting parents' attitudes towards vaccination. Attitudes towards vaccination vary from health literacy, sociodemographic characteristics, information sources and factors such as the COVID-19 pandemic. The studies analyzed are cross-sectional in specific regions. Therefore, the results cannot be generalized and changes in parents' attitudes cannot be monitored over time. Future attitude studies can be designed to cover all regions of the country and regional comparisons can be made. As a result of the planning of trainings aiming to increase the health literacy of parents, intervention studies can be conducted on the level of influence on their attitudes. The long-term effects of the pandemic on attitudes towards vaccination have not yet been determined. In the future, the effect of the pandemic process on attitudes and the permanence of this effect can be examined.

Studies should be conducted on the vaccine literacy of parents and trainings to be provided on this issue. Health authorities and professionals should be more active on social media platforms with accurate and reliable information. In addition, training programs should be organized to increase parents' health literacy and correct misinformation about vaccines. Thus, by providing parents with access to accurate information, attitudes towards vaccination can be changed positively.

Although parents' trust in the knowledge of healthcare professionals can positively affect their attitudes towards vaccination, healthcare professionals need to continuously update their knowledge on vaccination and improve their communication skills. In this context, continuous training programs should be organized for healthcare professionals and resources containing up-to-date and accurate information about vaccines should be provided. Thus, healthcare professionals can reduce vaccine hesitation and refusal by providing more effective and reliable information to parents.

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Appendix. Article Abstracts

Topçu et al. included 33 parents who refused childhood vaccinations in Ankara University and Adıyaman University Social Pediatrics Clinic and 99 parents who accepted childhood vaccinations between November and December 2017. The study group consisted of 21 mothers and 12 fathers who refused the vaccine and the control group consisted of 55 mothers and 44 fathers. A questionnaire study was conducted on the behavioral intentions and attitudes of parents towards childhood vaccines and their sources of information. The highest rates were distrust of vaccines (17%), belief that vaccines are dangerous (17%), trust in natural immunity (13%), and belief that vaccines are useless (13%). Among the parents who refused vaccines (33), 10 refused some vaccines and 23 refused all vaccines. The source of information for vaccine refusers was health professionals at a rate of 13% and social media at the same rate. In addition, people around them (36.3%), newspapers/magazines (27.3%) and scientific publications (21.2%) were also listed. The main reasons for rejection were possible side effects, autism and infertility claims. According to the authors, this is the first study in Türkiye on parental refusal of at least one vaccine and sociodemographic characteristics (13).

Argın et al. conducted their study in Kahramanmaraş province between May and June 2018. No sample selection was made in the neighborhood determined for the quantitative study and consisted of 110 parents (66.4% mothers and 33.6% fathers) with children of vaccination age who agreed to participate in the study. A data collection form consisting of questions on sociodemographic characteristics developed in line with the literature and a 20-question data collection form to assess vaccination knowledge/opposition was used. There was a significant correlation between the socioeconomic income level of the families and the side effects of vaccines. The higher the income level, the higher the level of knowledge. 67.3% of the parents think that vaccines have side effects. Healthcare professionals are the main source of information about vaccines. However, mass media also has a high rate. It was determined that 58.6% wanted to have their children administer the vaccines included in the national vaccination calendar, 21.8% did not want to, and 19.6% were undecided (14).

Hasar et al. included 61 parents (1st group) who were determined to have vaccine refusal for childhood vaccines in 2017-2018 in the central districts of Adana province and 148 parents (2nd group) who had their children vaccinated as a control group. In addition, 80.3% had vaccinated their children at least once before. Therefore, the number of families who refused vaccination according to the WHO definition is 19.7%. Of the parents who refused the vaccine, 96.7% had concerns such as vaccine side effects/lack of trust. The rate of being negatively affected by the media is 86.9%. 27.4% of the parents in the control group stated that the negative news they came across in the media about vaccination could affect their decisions (15).

In the study by Çelik et al. 23 mothers with children aged 0-5 years living in Ankara who refused vaccination of their children in 2019 participated in the study. As a result of the interview conducted with the mothers about the reasons for refusal; attitudes such as the fact that the uniform vaccine is applied to all children as required by the health policy of our country, the fact that the research conducted in the digital environment about its content consists of misinformation, the content is not deemed appropriate in religious terms, the tendency towards natural ingredients with the idea that the vaccine does not provide 100% protection, and distrust in the pharmaceutical sector were determined (16).

Çıklar and Güner conducted their study in Hatay province between August 2018 and May 2019. In the study, in which quantitative and qualitative methods were applied together, descriptive statistical analysis was performed with a questionnaire evaluating the knowledge, attitudes and behaviors of 350 mothers towards childhood vaccines. With the qualitative research method, 25 mothers were randomly selected to participate in the study and semi-structured questions were prepared and thematic language analysis was conducted with the content of the findings obtained by in-depth interview method. 98% of the mothers stated that vaccines are necessary. The reasons for the necessity of vaccination were stated as "creates resistance against microbes" by 36.15% and "protects against disease" by 47.52%, respectively. When the damages that can be seen in the child if vaccines are not administered are evaluated, 30% stated that their children would get sick frequently and 26.57% stated that they would get sick very quickly. Regarding the question when the first vaccine is given to a newborn baby, 65.43% of the mothers answered at birth. Lack of knowledge about paid vaccines (60.57%) was identified. Flu vaccine (33.33%) and rotavirus vaccine (24.64%) are the best-known paid vaccines (17).

Ertuğrul and Albayrak conducted their study in Kırıkkale province between January 11-31, 2019. With the quantitative research method, a descriptive questionnaire and descriptive statistical analysis of the European Health Literacy Scale Turkish Adaptation (EHSL-TR) were applied to 279 parents with 0-12-month-old babies with the lot quality technique in the sample. The mean health literacy (HLS) score of the parents was 30.57 ± 8.30, 62.8% had inadequate and problematic-limited overall HLS level, 98.6% had their children vaccinated, 74.6% made decisions about the health and vaccination status of their babies together with their spouses, 75.3% received information about vaccines from a doctor, 56.3% received information about vaccines from their spouses, 75.3% received information about vaccines from a doctor, 56.3% received information about vaccines from their spouses. 3% received

information about vaccines from the doctor and 56.3% from the midwife/nurse. 93.2% stated that their babies were vaccinated at the family medicine center and 61.6% stated that their babies did not experience any side effects after vaccination. More than half of the parents (57.7%) stated that routine vaccinations could be postponed in case of illness, while 38% stated that they could be postponed in case of fever. 98.6% of the parents stated that their children were vaccinated and 95.3% stated that vaccination was necessary. When the opinion on mandatory vaccination programs is examined, 81.4% think that vaccination should be mandatory (18).

Gökçe et al. conducted their study between September and November 2019 in Malatya province, and 151 parents who refused vaccination participated in the study. Parents were interviewed by telephone. As a result of the literature review, the study included questions about sociodemographic characteristics, parents' thoughts, behaviors and understanding of child vaccines. 91% of the participants refused vaccines due to the side effects of vaccines and 93% did not find the information provided by health personnel about vaccines sufficient. 95.4% stated that they received information from television, while 71% stated that it caused infertility (19).

Yıldızeli et al. conducted their study in Adana province between November 15, 2019 and January 15, 2020. Using a quantitative research method, 220 mothers with children aged 0-5 years who applied to the pediatric outpatient clinic of the hospital participated in the study. The personal information form included 33 questions on sociodemographic characteristics, knowledge and attitudes about vaccines, and the HLS. 95.9% of the mothers thought that vaccines were necessary and had high levels of HLS. A statistically significant difference was found between the mean total scores of the Health Literacy Scale and education level, employment status, social security status, number of children and paid vaccination status of their children. Mothers who had paid vaccination for their children had higher mean total HLS scores (20).

Atasever et al. conducted their study in two FHCs and one private hospital in Konya province between November 2019 and May 2020. Using a qualitative research method, 20 mothers who refused childhood immunizations participated in the study. A semi-structured introductory information form developed as a result of the literature review, views on immunization, views on vaccine refusal, views on the risks of vaccine refusal, and in-depth interview technique were used. Nvivo was used for qualitative data. The thematic framework was determined using the participants' responses. Mothers do not know about immunization. In addition, breast milk and propolis ranked first among traditional/alternative treatment methods. It was determined that mothers also used herbal products and spiritual practices. They were opposed to the vaccine because it is not produced in our country, and beliefs such as that it causes autism, that it contains harmful substances, and that the vaccinated child gets sick more often emerged (21).

Aygün and Tortop conducted their study in İstanbul between January and February 2020. In the study, in which quantitative and qualitative methods were applied together, the reasons for refusal were analyzed by thematic language analysis with a semi-structured interview form with 25 parents who refused vaccination according to the results obtained with the vaccine hesitation scale for 276 parents with children aged 0-5 years. Eight themes emerged. 87% of the participants were female and 43.5% were primary school graduates. The rate of hesitation regarding vaccination was 72%, 68% stated that social media was not effective in their decisions about vaccines, 64% stated that vaccines were objectionable in religion, 72% stated that the source and content of the disease were harmful, 64% stated that vaccines were useless, 56% stated that there was not enough information about vaccines, and 52% stated that infectious diseases were not dangerous. No significant difference was found in vaccine hesitancy according to age, number of children, level of education and seminar attendance (22).

Yüksel and Kara Uzun conducted their study in Ankara province between August and September 2020. With the quantitative research method, 133 parents with children in the age range of the national childhood vaccination schedule were given a questionnaire form (25 questions) consisting of demographic data, general attitude of the parent about vaccination, level of knowledge, antenatal follow-up status and thoughts about non-routine vaccines and descriptive statistical analysis was performed. It was found that 97.7% of the parents thought that vaccination was a necessary practice, 93.9% of them were fully vaccinated, 47.7% had knowledge about non-routine vaccines, but 17.4% had received non-routine vaccines. The most known non-routine vaccine was the rotavirus vaccine. There was a positive correlation between the level of education and occupation of the mother and non-routine vaccination of her children. No vaccine hesitancy or opposition to vaccination was found in the study (23).

Emlek Sert et al. conducted their study on the streets of Bornava district in İzmir province between February and June 2020. A total of 302 parents with children aged 0-5 years participated in the quantitative study. Descriptive statistical analysis was performed with a 26-question questionnaire created in line with the literature. While 97.7% of the parents fully vaccinated their children according to the national vaccination schedule, 2.3% did not vaccinate their children. 98% trusted the information provided by health professionals about vaccination. Although parents' level of knowledge about vaccines was quite good, negative knowledge and beliefs that may affect vaccination were also found to exist (24).

Gültekin and Çağlar conducted their study between March and June 2020 and 10 parents of children aged 0-4 years who did not come to İstanbul Gaziosmanpaşa Mustafa Furuncu FHC for vaccination were called and reminded of routine vaccinations. Families who refused the vaccine were told about the study and interviewed by phone because it coincided with the pandemic period. In the qualitative study, the sociodemographic characteristics of the families, the vaccines that refused to be administered to their children, the vaccination status of their other children, and the reason for the parents' refusal were examined. In the study, it was determined that families lacked information about vaccine content and met their information needs from non-scientifically based content in the digital environment (25).

Korkmaz et al. conducted their study in İstanbul between June 24 and December 24, 2020. Between December 12, 2017 and December 24, 2020, 44 parents who refused to have their child vaccinated against Hepatitis B at birth participated in the quantitative study. A questionnaire consisting of 24 questions about socio-demographic characteristics, reasons for not vaccinating, and whether there was a change of opinion after the COVID 19 pandemic was used. As a result of descriptive statistical analyses, when a comparison was made between parents who refused the vaccine before the pandemic (Group 1: 20) and parents who refused the vaccine during the pandemic (Group 2: 24); the opinion that Group 2 also gets infectious diseases is significant compared to Group 1. The opinions of all parents about vaccine refusal did not change during the process. The opinion that vaccines contain harmful substances was significantly higher in both groups. In Group 2, the beliefs that vaccines do not protect against diseases, that they are not necessary and that different diseases develop due to vaccination are statistically significant (26).

Yörük and Güler conducted a study in Sakarya province between September and December 2020. Using a quantitative research method, 370 parents with children between the ages of 12 months and 6 years who received services from the prenatal class of a tertiary hospital in Türkiye participated in the study. Vaccine hesitancy was 13.8% and vaccine refusal was 4.8%. Vaccine hesitancy was significantly higher in mothers with university education, who became pregnant with treatment, who did not receive training on pediatric vaccines in prenatal follow-up, who followed anti-vaccine groups on social media, and who followed anti-vaccine groups. The reasons for hesitation were determined as not using regular vitamin D and iron supplements, becoming pregnant with treatment, following anti-vaccine groups on social media and being concerned about the content of the vaccine (27).

Duran et al. conducted a study in Edirne province between August 2020 and February 2021. The quantitative study consists of two groups. In Group 1, there were 160 parents of children admitted after the first peak of the COVID-19 pandemic, and in Group 2, there were 450 parents of children admitted after the second peak, totaling 610 parents participated. The World Health Organization's 10-item Vaccine Hesitancy Scale (WHO-VHS) was administered to each group. The number of parents who hesitated about childhood vaccinations was 17 (10.6%) in Group 1 and 90 (20%) in Group 2, with a statistically significant difference between the two groups. Parents who have experienced COVID-19 or are concerned about the devastating effects of this disease have low hesitant attitudes towards childhood and COVID-19 vaccines. However, as the pandemic progressed, parents' hesitancy towards childhood vaccines increased (28).

Çay and Göl conducted their study in the Western Black Sea Region between November 2020 and February 2021. In the quantitative study, 110 parents with children aged 0-6 years participated in a cross-sectional descriptive study. It was determined that 90.9% of the parents had their children vaccinated and 29.1% had at least one special vaccine. 85.5% thought that vaccines were necessary. 74.5% think that vaccines have side effects, 8.5% think that autism and 6.1% think that infertility is a side effect of vaccines (29).

Dağlı and Topkara conducted their study online in Türkiye between February 15 and March 26, 2021. In the quantitative study, 1038 parents with children aged 0-59 months participated in a cross-sectional descriptive study. An introductory information form, parents' attitudes towards childhood vaccines scale (PACV) and HLS were used in the study. The mean PACV score of the parents was 2.33 ± 0.83 and 42.3% had low, 33.6% had moderate and 24.1% had high vaccine hesitancy. Vaccine hesitancy decreased as the parents' level of HLS increased. Parents who received information about vaccines had higher levels of HLS than those who did not receive information. This shows that parents tend to learn more about vaccines as their HLS levels increase. 82.1% of parents received information about vaccines and 15.5% received negative information about vaccines. The proportion of parents who received negative opinions about vaccines from health personnel was 8.2% (30).

Akman and Yıldız conducted their study between June and November 2021 with 347 mothers of children aged 0-2 years living in Nevşehir province, who participated online with the snowball sampling method. Sociodemographic characteristics and antivaccine scale were used. In the study, a moderate level of opposition to vaccination was found. While 45.2% of the mothers reported that they were concerned about vaccine side effects, 22.8% of them had vaccine hesitancy (31).

Torun and Bal Yılmaz conducted their study in Bursa province between June and August 2021. In the quantitative study, 220 parents with children aged 0-5 years who applied

to family medicine participated in the cross-sectional study. Sociodemographic information form, vaccine information form and attitude towards vaccination scale were used. Descriptive statistical analyses revealed that 77.3% of the parents decided to vaccinate their children together. 90.9% stated that their children were vaccinated in accordance with the national vaccination schedule. When the reasons of those who did not give permission for vaccination were examined, it was determined that they did not vaccinate their children on the grounds that vaccines were harmful to human health. The higher the income level of the participants, the higher their level of knowledge. When attitude towards vaccination was analyzed, it was determined that 45.91% of the participants had a "positive attitude" and 1.36% had a "negative attitude" (32).

In the study by Ayyıldız and Kolcu, 206 mothers with healthy babies who were hospitalized in the postpartum ward of a training and research hospital between May and September 2021 participated. In the questionnaire created as a result of the literature review, the effect of giving birth during the COVID-19 pandemic on attitudes towards childhood vaccinations was examined. 53.9% of the mothers stated that giving birth during the COVID-19 pandemic did not affect their attitude towards vaccination. The rate of knowledge about childhood vaccines is low (36.4%). They stated that 72.8% received information about vaccines from nurses (33).

In Üstüner Top et al.'s study, 582 parents with children aged 3-5 years participated online between July and October 2021. As a result of the literature review, sociodemographic characteristics, digital literacy scale, cyberchondria severity scale and parental attitude towards childhood vaccinations scale were used. The vaccine hesitancy rate of parents was found to be 31.3%. The rate of being affected by anti-vaccine news on social media was 28.3%. The rate of not trusting vaccines as a reason for not fully vaccinating their children was 24.5% (34).

Durmaz et al. conducted a study on the parents of children aged 0-5 years who were hospitalized in three different cities in Türkiye between September and December 2021. One thousand and eighty-seven parents participated in the study in which sociodemographic characteristics, PACV and attitudes towards COVID-19 vaccines scale (ATV-COVID-19) were used. Parents who are hesitant about childhood vaccinations have very low attitudes towards COVID-19 vaccines and are influenced by social media. Vaccine hesitation rate is 9.8 (35).

Turan conducted his study in Aksaray province between March-September 2022. A total of 259 parents with children aged 0-18 years participated in the quantitative study by snowball sampling method. Descriptive statistical analysis was performed using a personal information form and the PACV. It was determined that 58.71% (n= 150) of the parents had vaccine hesitancy, 79.15% of them stated that the COVID-19 pandemic negatively affected their attitudes towards childhood vaccinations, the most frequently used information sources were acquaintances/friends, while the least frequently used information sources were FHC physicians/nurses (36).

Mercan et al. conducted their study in Kırklareli province between March and June 2022. A total of 158 parents participated in the quantitative study with a cross-sectional method. A descriptive information form and the scale of parents' attitudes on child vaccinations were used. 97.5% of the participants knew that vaccination was necessary, 73.4% knew that a child with a fever above 38 degrees Celsius would not be vaccinated, and 77.2% knew that vaccines had side effects. 94.3% of the parents reported that the agenda they heard about opposition or hesitation to vaccination did not affect them. 98.1% of the survey group reported that their last child was vaccinated on time. When analyzed for each vaccine according to the national vaccination calendar, 78.3%-98.7% of the research group stated that their last child was vaccinated on time, 0.7%-8.0% stated that they received their vaccinations even with a delay, and parents stated that they received information from healthcare professionals and online sources (37).

Akgül and Ergün conducted their study in İstanbul between June 01-30, 2022. One of the parents (n= 191; 88% mother, 9.9% father, 2.1% other) of primary school students in İstanbul participated in the quantitative study. Sociodemographic diagnostic form, scale of parents' attitudes towards childhood vaccines and scale of attitudes towards COVID-19 vaccines were used. It was found that 24.1% of the parents were hesitant about childhood vaccinations, 12% did not find childhood vaccinations necessary, 2.1% did not vaccinate their first child and 5.3% did not vaccinate their other children, and 7.9% regretted having their children vaccinated before the pandemic period (38).

Kurt et al. conducted their study in Adıyaman province between September 1 and October 22, 2022. In the quantitative study, 300 families who refused vaccination in 2014-2021 participated. The questionnaire, which was created in line with the literature, included sociodemographic questions, reasons for vaccine refusal and vaccine attitude scale. Descriptive statistical analyses showed that 9.3% of the families were convinced about vaccination after general vaccination information was given to them. Participants who received some vaccines (11.6%) had a higher rate of persuasion than those who did not receive any vaccines (2.6%). Fathers (17.3%) had significantly higher rates of persuasion than mothers (7.7%) (39).

Didem et al. conducted their study in Edirne province between January 15 and June 15, 2023. In the quantitative study, 315 parents with preschool-age children participated. Sociodemographic characteristics, literature-based questions about the factors that may lead to vaccine hesitancy and the

PACV scale were used. The rate of vaccine hesitancy was 13%. Factors associated with hesitation were low-income level, religious concerns based on cultural and contextual factors, and negative media narratives (40).

Yorulmaz et al. conducted their research in Türkiye between April and June 2023. The qualitative study was conducted using a phenomenological research design. Fifteen parents with children aged 0-24 months participated. Their views on sociodemographic characteristics, childhood vaccinations and vaccine refusal were obtained. The consolidated list of criteria (COREQ) was used for reporting the study. MAXQDA qualitative data analysis software was used. As a result, they stated that they had vaccination awareness and knowledge, believed that vaccines protected their children from diseases, trusted the information they received from healthcare professionals, and that this information was effective in their decision to vaccinate. Regarding attitudes towards vaccine refusal, most parents did not experience hesitation. However, some of them stated that negative news about vaccines on social media affected them. The impact of the COVID-19 pandemic on vaccination was that they postponed their vaccination appointments during this process, and that their concerns decreased thanks to communication with healthcare professionals, and they went to vaccination (41).

Silahlı et al. conducted their study in Türkiye between April and June 2023. In the quantitative study, 138 parents with children aged 0-24 months participated by snowball sampling method. The parental attitudes towards childhood vaccines scale and sociodemographic data form were used. Descriptive statistical analyses showed that 63% of the parents had no hesitation about childhood vaccines. 73% (n= 72) reported that vaccination was more effective than natural immunization, 16 (16.33%) participants decided not to vaccinate, while 10 (10%) participants postponed vaccination. 69.38% (n= 68) trusted the information they received about vaccines and reported that they could openly discuss their concerns about vaccines with health professionals. When asked about the sources of information about childhood vaccinations, 92.78% (n= 90) of respondents reported receiving information from health professionals. In contrast, 53.61% (n= 52) of respondents reported using online sources (42).