



Knowledge and Attitudes of Parents with Children Aged 0-5 with Respect to Childhood Vaccines

0-5 Yaş Arası Çocuğu Olan Ebeveynlerin Çocukluk Çağı Aşılarına İlişkin Bilgi ve Tutumları

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Abstract

Objective: Vaccines are the most cost-effective public health tools for preventing infectious diseases and disease-related disabilities and deaths. Millions of children are saved every year through vaccination. However, increasing the rate of success through more vaccination is prevented worldwide by increasingly negative attitudes resulting from false information and other various reasons. This study aimed to determine the knowledge and attitudes of parents with children aged 0-5 with respect to childhood vaccines.

Material and Methods: The study was descriptive and cross-sectional. Its population consisted of 220 parents with children aged 0-5, who applied to the Family Health Center in Bursa, a city of Türkiye. The study was conducted between June and August 2021.

Results: It was revealed that the parents participating in the study were mostly female and unemployed, and that the parents jointly made the decision to vaccinate their child. Measles vaccine was the one most commonly known, while fever was the most commonly known adverse effect. The participants were most hesitant about the content of the vaccine. They obtained their knowledge of the vaccine mostly from health-care professionals. While 45.91% of the participants had a positive attitude towards vaccination, 1.36% had a negative attitude.

Conclusion: In line with the findings, it was determined that when the knowledge level of the parents increased, their attitudes towards the vaccine also increased in a more positive way.

Keywords: Vaccine, anti-vaccination, vaccine hesitancy, knowledge, attitude

Öz

Giriş: Aşılar, bulaşıcı hastalıklardan ve hastalıkların neden olduğu sakatlıklar ve ölümlerden korunmada en etkili maliyet etkin halk sağlığı aracıdır. Aşılar sayesinde her yıl milyonlarca çocuğun hayatı korunmaktadır. Çeşitli nedenlerle tüm dünyada aşılar karşı giderek artan olumsuz tutum ve bilgiler, aşılarından elde edilen başarıları engellemektedir. Bu çalışmanın amacı 0-5 yaş arası çocuğu olan ebeveynlerin çocukluk çağı aşılarına ilişkin bilgi ve tutumlarının belirlenmesidir.

Gereç ve Yöntemler: Çalışma, tanımlayıcı ve kesitsel nitelikte yapılmıştır. Çalışmanın örneklemini, Bursa'da bir Aile Sağlığı Merkezine başvuran, 0-5 yaş arası çocuğu olan 220 ebeveyn oluşturmuştur. Araştırma Haziran-Ağustos 2021 tarihleri arasında gerçekleştirilmiştir.

Bulgular: Araştırmaya katılan ebeveynlerin çoğunluğunun anne olduğu ve çalışmadığı, çocuğa aşı uygulanmasını anne ve babanın birlikte karar verdikleri belirlenmiştir. En sık bilinen aşı kızamık olurken ateş bilinen en yaygın yan etki olmuştur. Katılımcılar en çok aşının içeriğindeki maddelerden dolayı tereddüt etmektedirler. Katılımcılar aşıya ilişkin bilgileri en çok sağlık çalışanlarından elde etmektedir. Katılımcıların %45.91'i aşıya karşı olumlu tutum gösterirken; %1.36'sı olumsuz tutum göstermektedir.

Sonuç: Elde edilen bulgular doğrultusunda ebeveynlerin bilgi düzeyleri arttığında aşıya ilişkin tutumlarının daha olumlu yönde arttığı saptanmıştır.

Anahtar Kelimeler: Aşı, aşı karşıtlığı, aşı tereddütü, bilgi, tutum

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Introduction

Immunization is the creation of an artificial immune response in the host by using biological agents with reduced virulence. The vaccine both protects the individual by creating an immune response in the body and reduces the incidence of that disease in the community by reducing the exposure of unvaccinated individuals to the agent (1). In our country, some diseases such as polio have been eradicated, and significant reductions in the incidence of other diseases have been achieved with meticulously implemented immunization programs (2). Significant successes have been achieved with immunization not only at national level but also worldwide. According to the World Health Organization (WHO) data, 17% of the diseases that cause death in children under five years of age globally can be prevented by immunization (3). However, these achievements have been undermined by individuals who refuse or delay immunization (4). In Romania, 11.7% of the parents and in Malaysia, 18.2% of the parents have refused vaccination, and the consumption of measles, mumps and rubella vaccines has decreased in developed countries such as the USA and the UK. In a study conducted by Khattak et al. in Pakistan with the children of 610 parents, 27.9% of the parents refused to vaccinate their children and 60.6% of the refusing parents thought that vaccines had serious side effects. Khattak et al. reported that the main reasons for low vaccination rates were low socioeconomic status, education level and unemployment (5). Increasing opposition to vaccination all over the world has led to the re-emergence of some epidemics such as measles, which had been controlled with effective immunization. Therefore, vaccine-related studies are needed to prevent anti-vaccination. This study was conducted to determine the knowledge and attitudes of parents regarding childhood vaccines.

Materials and Methods

Type of Study

The study was designed as cross-sectional and descriptive.

Place and Time of the Study

The study was conducted in a Family Health Center in Bursa between June and August 2021.

Research Population and Sample

The study population consisted of 500 parents with children between zero and five years of age registered in

a selected Family Health Center in Bursa, and the sample consisted of 230 parents who met the inclusion criteria of the study. The study was completed with 220 parents since incorrect questionnaires were excluded from the evaluation.

Data Collection Method

Data of the study were collected through face-to-face questionnaire interviews. "Socio-demographic data form", "vaccine information form" and "attitudes towards vaccination scale" were used to collect the data.

Data Collection Tools

Socio-Demographic Data Form: The form was prepared by the researcher and consisted of questions on sex, age, occupation, spouse's occupation, educational status, spouse's educational status, number of children, total monthly income, presence of social security, and the parent who decided to vaccinate the child (Appendix 1).

Vaccine Information Form: This form was prepared by the researchers in line with the relevant literature and consisted of 24 questions questioning parents' knowledge about vaccines. Participants who could answer the questions as yes, no, and no idea were given one point for yes answers and zero points for no and no idea answers. Participants could get a maximum of 24 points from the vaccination information form. Expert opinion was obtained from five experts (pediatric health and diseases nursing faculty member) for the form. No changes were needed in the form after expert opinion (Appendix 2).

Attitudes Towards Vaccination Scale: The scale was developed by Cvjetkovic et al. in 2017 and consists of 14 items. The scale consists of two sub-dimensions: attitude and opinion. Items 2, 3, 4, 12, 13, and 14 represent the attitude subdimension, and items 1, 5, 6, 7, 8, 9, 10, and 11 represent the thought subdimension. Turkish validity and reliability were conducted by Özümit in 2019. Scale items generally cover attitudes, behaviors and thoughts of individuals regarding vaccination practices. The attitudes towards vaccination scale is a 5-point Likert-type scale; it is scored as 1 "Strongly disagree" and 5 "Strongly agree". Reverse scoring is applied for items containing negative expressions in scoring. Scores between 14-32 are considered as negative attitude, scores between 33-51 as moderate and scores between 52-70 as positive attitude (6). For this study, the alpha coefficient of the opinion subdimension of the vaccine attitude scale was 0.810; the alpha coefficient of the attitude subdimension was 0.827; and the overall alpha coefficient of the vaccine attitude scale was 0.800 (Appendix 3).

Appendix 1. Socio-demographic data form

1) Sex

() Female () Male

2) Your age

() 18-25 () 26-30 () 31-35 () 36-40 () 41-45 () 46 and above

3) Profession

() Not working () Civil Servant () Laborer () Tradesman () Health Worker () Other

4) Profession of your spouse

() Not working () Civil Servant () Laborer () Tradesman () Health Worker () Other

5) Education Status

() Illiterate () Literate () Primary School () Secondary School () High School () University

6) Education status of your spouse

() Illiterate () Literate () Primary School () Secondary School () High School () University

7) Number of Children

() 1 () 2 () 3 () 4 and above

8) Total monthly income

() 0-1500 TL () 1501-3000 () 3001-4500 () Over 4500

9) Do you have social security? If yes, please specify.

.....

10) Which parent decides whether to vaccinate a child?

.....

Appendix 2. Vaccine information form

11) Biological products developed by eliminating the disease-causing properties of microbes such as viruses, bacteria, etc. that are capable of causing disease in humans and animals or by eliminating the effects of toxins secreted by some microbes are called vaccines.

Yes () No () No Idea ()

12) Vaccines are administered to healthy and at-risk people to protect them from diseases and their consequences.

Yes () No () No Idea ()

13) With the vaccine, the body recognizes germs that do not harm it, so that when it encounters the real germ, the person does not get sick thanks to the pre-developed defense system.

Yes () No () No Idea ()

14) Vaccines are highly reliable biological products. They are strictly controlled during production and distribution.

Yes () No () No Idea ()

15) Substances such as aluminum, thiomersal (ethyl mercury) in vaccines are at a very low level so as not to harm human health.

Yes () No () No Idea ()

16) Scientific evidence does not confirm the claims that vaccines increase a number of chronic diseases, especially autism.

Yes () No () No Idea ()

17) Administering more than one vaccine to a child creates an excessive burden on the child's immune system.

Yes () No () No Idea ()

18) Fever, headache, muscle pain, loss of appetite, pain at the injection site, swelling and redness are mild side effects that can be seen after vaccination.

Yes () No () No Idea ()

19) After vaccine administration, cold application and paracetamol can be given as painkillers instead of injection to relieve complaints when necessary.

Yes () No () No Idea ()

20) Vaccinations in the Ministry of Health vaccination calendar are given to children free of charge.

Yes () No () No Idea ()

21) When is the first vaccination given to a newborn baby?

() At birth () At one month () At one year of age () I don't know

22) It is legally obligatory to receive the vaccines included in the vaccination calendar.

Yes () No () No Idea ()

23) The vaccines included in the vaccination schedule protect children against which of the following diseases.

Pertussis Yes () No () No Idea ()

Polio Yes () No () No Idea ()

Diphtheria (croup) Yes () No () No Idea ()

Hepatitis A Yes () No () No Idea ()

Hepatitis B Yes () No () No Idea ()

Mumps Yes () No () No Idea ()

Measles Yes () No () No Idea ()

Rubella Yes () No () No Idea ()

Pneumonia Yes () No () No Idea ()

Varicella Yes () No () No Idea ()

Tetanus Yes () No () No Idea ()

Tuberculosis Yes () No () No Idea ()

24) Have you had or will you have your child vaccinated with all of the vaccines in the vaccination calendar?

☐ Yes ☐ No

- If no, what is the reason?

☐ Vaccines are not necessary for human health.

☐ Vaccines contain substances harmful to the human body.

☐ Companies producing vaccines do not think about human health.

☐ Natural immunization or alternative and complementary medicine (cupping etc.) is more effective in preventing diseases.

☐ Vaccines have serious side effects such as autism.

☐ Vaccines contain substances such as dead fetuses and pig gelatin.

☐ Vaccines cause infertility.

☐ Vaccines are religiously objectionable.

☐ Other.....

25) Although very rare, vaccines can have serious side effects.

☐ Yes ☐ No

- If yes, which of the following is or are?

☐ Infection of the lymph nodes

☐ Parotitis (swelling of the salivary glands)

☐ Bone infection

☐ Fever

☐ Prolonged crying attack in infants

☐ Febrile convulsion

☐ Rash

☐ Hypotonic hyporesponsive attack (pallor, unresponsiveness to environmental stimuli, muscle relaxation)

☐ Diarrhea, vomiting

☐ Thrombocytopenia (decrease in blood cells that stop bleeding)

☐ Anaphylaxis (allergic shock picture)

26) What are your sources of information about vaccines?

☐ Social media (X, Facebook, etc.)

☐ Scientific journals, articles

☐ Health professionals (physicians, nurses, midwives, etc.)

☐ Social environment (relatives, neighbors, etc.)

27) Would the broadcasting of informative public service announcements about vaccination on television by the competent authorities (e.g. Ministry of Health) increase your confidence in vaccination?

☐ Yes ☐ No ☐ No Opinion (Please specify your thoughts, if any.).....

Appendix 3. Attitudes towards vaccination scale

	Totally agree	Agree	Undecided	Disagree	Totally disagree
1) Allegations in the media that vaccines can cause certain psychological and neurological diseases such as autism and multiple sclerosis cause me to worry about the safety of vaccination.					
2) It is important to immunize the entire population to prevent the emergence of new epidemics.					
3) Educating parents about vaccines is an important way to bring the population into vaccination coverage.					
4) Doctors and nurses have an important role in educating parents about the importance of childhood immunization.					
5) Since all of the diseases included in the vaccination program are now very rare, it is no longer necessary to vaccinate children.					
6) Stopping an infectious disease is safer than vaccinating against it.					
7) Vaccines contain substances that are proven to be harmful to children's health.					
8) Before compulsory vaccination, diseases were being eradicated through better hygiene and sanitation.					
9) The state does not have the right to mandate vaccination of children; it should be the parents who make the positive decision for their children.					
10) There is insufficient evidence that vaccination prevents the occurrence of infectious diseases.					
11) Pharmaceutical companies are aware that vaccination is harmful, but in order to make a profit, they encourage vaccination of children.					
12) (If I were the responsible person) I would vaccinate children as part of the recommended immunization program.					
13) (If I am the responsible person) I recommend that parents vaccinate their children as part of the recommended immunization program.					
14) If HIV (the virus that causes AIDS) and hepatitis vaccines against C (the virus that causes jaundice) were available I would definitely get vaccinated.					

Data Analysis

Data were analyzed using SPSS (Statistical Package for Social Sciences) for Windows 25.0 software. Descriptive statistical methods (number, percentage, mean, standard deviation) were used to evaluate the data. Whether the data were normally distributed or not was evaluated with normality tests as well as histograms, Q-Q graphs, box-plot graphs, skewness and kurtosis and distribution measures such as coefficient of variation (7). In order to

ensure normality, values should be observed close to the 45-degree line in the scatter diagram and the box should be positioned by centering the median line in the box-plot graph (8). In our study, normal distribution was checked with kurtosis-skewness values. When normal distribution was achieved, Pearson's correlation analysis and t-test were used for continuous variables between two groups, and ANOVA test was used for comparisons with more than two groups.

Table 1. Distribution of socio-demographic characteristics of the participants (n= 220)

Descriptive features		n (%)
Parent replying the questionnaire	Mom	179 (81.4)
	Dad	41 (18.6)
Age (years)	18-25	20 (9.1)
	26-30	52 (23.6)
	31-35	67 (30.5)
	36-40	41 (18.6)
	41-45	33 (15.0)
	46 and over	7 (3.2)
Profession	Not-working	107 (48.6)
	Civil servant	28 (12.7)
	Laborer	28 (12.7)
	Tradesman	4 (1.8)
	Healthcare professional	13 (5.9)
	Other (lawyer, judge, prosecutor, architect, engineer, banker, contractor, pilot, university lecturer, and etc.)	40 (18.2)
Education status	Illiterate	4 (1.8)
	Literate	4 (1.8)
	Elementary school	25 (11.4)
	Middle school	27 (12.3)
	High school	53 (24.1)
	University	107 (48.6)
Number of children	1	88 (40.0)
	2	89 (40.5)
	3	31 (14.1)
	4 and over	12 (5.5)
Total monthly income	0-1500 TL	4 (1.8)
	1501-3000 TL	33 (15.0)
	3001-4500	62 (28.2)
	4500 and over	121 (55.0)
Presence of social security	Yes	201 (91.4)
	No	19 (8.6)
Parent who decides to vaccinate the child	Mother	45 (20.5)
	Father	5 (2.3)
	Both	170 (77.3)

Results

Of the participants, 81.4% were mothers. When the age distribution of the participants was analyzed, 30.5% were between the ages of 31 and 35 and when the occupational distribution was analyzed, 48.6% of them were not working. It was found that most of the participants had one or two children, and 48.6% of them were university graduates. It was found that 55% of the participants had an income of 4500 TL

and above, 91.4% had social security, and 77.3% of the parents decided to vaccinate the child together (Table 1).

The scale items measuring the participants' knowledge about vaccines are given in Table 2.

According to the information obtained from the vaccination information form, 90.9% of the participants stated that their children received the vaccines included in the vaccination calendar. When the reasons for those who

Table 2. Parents' knowledge on vaccinations

Information on vaccination		n (%)
Biological products developed by eliminating the disease-causing properties of microbes such as viruses, bacteria, etc. that are capable of causing disease in humans and animals or by eliminating the effects of toxins secreted by some microbes are called vaccines.	Yes	177 (80.5)
	No	6 (2.7)
	No idea	37 (16.8)
Vaccines are administered to healthy and at-risk people to protect them from diseases and their consequences.	Yes	190 (86.4)
	No	11 (5.0)
	No idea	19 (8.6)
With the vaccine, the body recognizes germs that do not harm it, so that when confronted with the real germ, the person does not get sick thanks to a pre-developed defense system.	Yes	183 (83.2)
	No	15 (6.8)
	No idea	22 (10.0)
Vaccines are highly reliable biological products. They are strictly controlled during production and distribution.	Yes	168 (76.4)
	No	10 (4.5)
	No idea	42 (19.1)
Substances such as aluminum, thiomersal (ethyl mercury) in vaccines are at a level that does not harm human health.	Yes	110 (50.0)
	No	14 (6.4)
	No idea	96 (43.6)
Scientific evidence does not confirm claims that vaccines increase some chronic diseases such as autism.	Yes	97 (44.1)
	No	18 (8.2)
	No idea	105 (47.7)
Multiple vaccinations overload the child's immune system.	Yes	62 (28.2)
	No	91 (41.4)
	No idea	67 (30.5)
Fever, headache, muscle pain, loss of appetite, pain at the injection site, swelling and redness are mild side effects that can occur after vaccination.	Yes	195 (88.6)
	No	5 (2.3)
	No idea	20 (9.1)
After vaccination, cold application and painkillers can be given to alleviate complaints if necessary.	Yes	167 (75.9)
	No	7 (3.2)
	No idea	46 (20.9)
Vaccinations included in the Ministry of Health vaccination calendar are given to children free of charge.	Yes	204 (92.7)
	No	1 (0.5)
	No idea	15 (6.8)
When is the first vaccine given to a newborn?	At birth	25 (11.4)
	1 st month	87 (39.5)
	1 year old	95 (43.2)
	I do not know	13 (5.9)
It is legally mandatory to receive the vaccinations included in the vaccination calendar.	Yes	102 (46.4)
	No	77 (35.0)
	No idea	41 (18.6)

did not allow vaccination were analyzed, it was determined that they did not get their children vaccinated on the grounds that vaccines are harmful to human health. In addition, the participants stated that they thought that vaccines had side effects such as fever, that they most frequently received

information about vaccination from healthcare professionals, and 62.7% of the participants stated that the broadcasting of informative public service announcements about vaccination on television by competent authorities would increase trust in vaccination (Table 3).

Table 2. Parents' knowledge on vaccinations (continue)

The vaccines in the vaccination schedule protect children against which or which of the following diseases?		n (%)
Pertussis	Yes	111 (50.5)
Polio	Yes	145 (65.9)
Diphtheria	Yes	29 (13.2)
Hepatitis A	Yes	128 (58.2)
Hepatitis B	Yes	142 (64.5)
Mumps	Yes	142 (64.5)
Measles	Yes	189 (85.9)
Rubella	Yes	146 (66.4)
Pneumonia	Yes	59 (26.8)
Varicella	Yes	167 (75.9)
Tetanus	Yes	117 (53.2)
Tuberculosis	Yes	34 (15.5)

According to the attitudes towards vaccination scale, scores between 14-32 indicate "negative attitude", scores between 33-51 indicate "moderate" and scores between 52-70 indicate "positive attitude" towards vaccination. When the scores of the participants on the scale of attitudes towards vaccination are categorized, 45.91% of the participants show "positive attitude", while 1.36% of the participants show "negative attitude" towards vaccination (Figure 1).

The comparison of the participants' socio-demographic data and their scores from the vaccination information form is given in Table 4. When the results were examined, it was determined that the participants' knowledge scores about vaccination did not show a statistically significant difference according to their sex, age, occupation, educational status, and the presence of social security ($p > 0.05$) (Table 4).

It was found that there was a statistically significant difference in the participants' vaccination knowledge scores according to the number of children they had ($p < 0.05$). The vaccination knowledge level of the participants decreases as the number of children increases (Table 4).

It was found that the participants' knowledge about vaccination scores showed a statistically significant difference according to their income level ($p < 0.05$). The higher the income level of the participants, the higher their level of knowledge (Table 4).

It was found that the knowledge scores of the participants about vaccination showed a statistically significant difference according to the parent who decided to vaccinate the child ($p < 0.05$). The knowledge level of individuals whose parents decided to vaccinate the child together was higher than the knowledge level of individuals whose parents decided to vaccinate the child separately (Table 4).

The comparison of the socio-demographic data of the participants and the scores they obtained from the attitudes towards vaccination scale is given in Table 5. When the results were examined, it was found that the overall attitude towards vaccination, thought subdimension and attitude subdimension scores did not show a statistically significant difference according to the participants' sex, age, occupation, educational status, number of children they had, the presence of social security and the parent who decided to vaccinate the child ($p > 0.05$) (Table 5).

It was determined that the total attitude towards vaccination scores of the participants showed a statistically significant difference according to their monthly income ($p < 0.05$). As the income level of the participants increased, their positive attitudes towards vaccination also increased (Table 5).

Discussion

In our study conducted to determine the level of knowledge about childhood vaccines and attitudes towards vaccines of parents with children between zero and five years of age, the Cronbach's alpha coefficient of the vaccine information form was found to be "0.843", the alpha coefficient of the thought subdimension of the attitudes towards vaccines scale was found to be "0.810", the alpha coefficient of the attitude subdimension was found to be "0.827", and the overall alpha coefficient of the scale was found to be "0.800". The reliability of the scales is evaluated by Cronbach's alpha (α) coefficient, which takes a value between 0 and 1. Scales with values between "0.80" and "1.00" are considered highly reliable (9). According to the results we obtained, the scales were found to be reliable. In the scale study conducted by Özümit, the alpha coefficient of the thought sub-dimension of the scale was found to be "0.90", the alpha coefficient of the

Table 3. Parents' attitudes towards childhood vaccines

		n (%)
Have you vaccinated your child with all the vaccines on the vaccination schedule?	Yes	200 (90.9)
	No	20 (9.1)
The reason for not getting the child vaccinated**	Vaccinations are not necessary for human health.	3 (15.0)
	Vaccines contain substances harmful to the human body	4 (20.0)
	Companies producing vaccines do not think about human health.	3 (15.0)
	Natural immunization or alternative and complementary medicine (cupping etc.) is more effective in preventing diseases.	1 (5.0)
	Vaccines have serious side effects such as autism.	4 (20.0)
	Vaccines contain substances such as dead foetus, pig gelatin.	2 (10.0)
	Vaccines cause infertility.	1 (5.0)
	Vaccines are religiously objectionable.	2 (10.0)
Although very rare, vaccines can have serious side effects.	Yes	145 (65.9)
	No	75 (34.1)
Vaccine side effects**	Infection of the lymph nodes	16 (11.0)
	Paratite	5 (3.4)
	Bone infection	6 (4.1)
	Fire	126 (86.9)
	Prolonged crying attacks in infants	40 (27.6)
	Febrile convulsions	32 (22.1)
	Rash	50 (34.5)
	Hypotonic hyporesponsive attack	5 (3.4)
	Diarrhea, vomiting	12 (8.3)
	Thrombocytopenia	2 (1.4)
	Anaphylaxis	11 (7.6)
What are your sources of information on vaccines**	Social media	22 (10.0)
	Scientific journal, article	23 (10.5)
	Health workers	80 (36.4)
	Social environment	26 (11.8)
Would the broadcasting of informative public service announcements about vaccination on television by competent authorities (e.g. Ministry of Health) increase your confidence in vaccination?	Yes	138 (62.7)
	No	46 (20.9)
	No idea	36 (16.4)

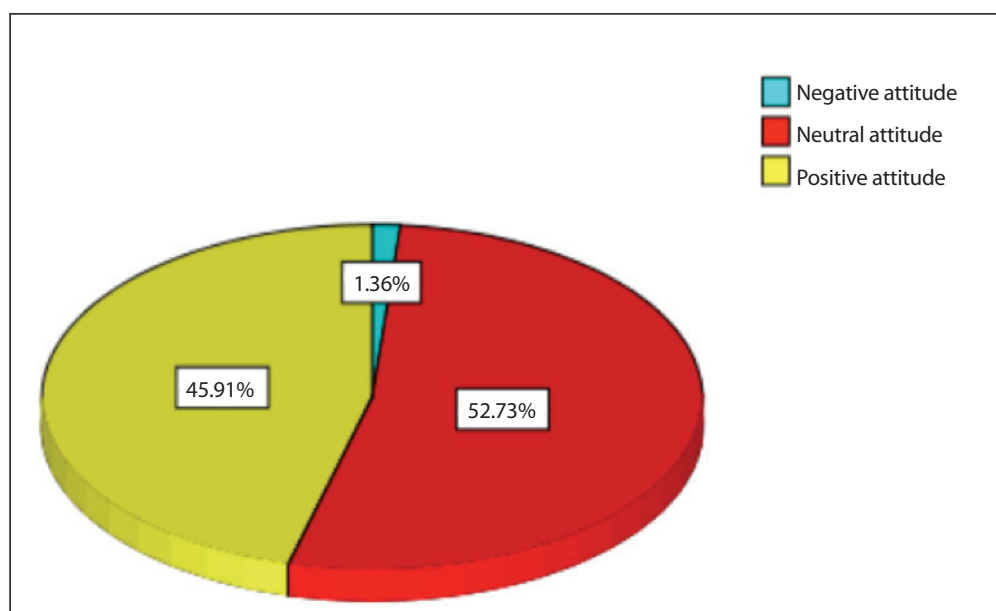


Figure 1. Parents' attitudes towards vaccines.

attitude subdimension was found to be "0.87" and the general alpha coefficient of the scale was found to be "0.853", which are similar to those of our study (10).

A significant positive weak correlation was found between the participants' level of knowledge about vaccination and their attitudes towards vaccination ($p < 0.05$). According to the results of the study, the increase in parents' knowledge about vaccination ensures that their attitudes towards vaccination are positive.

No statistically significant difference was found in the attitudes of the participants towards vaccination according to sex, age, occupation, educational status, number of children they had and the parent who decided to vaccinate ($p < 0.05$). Similarly, in a study conducted by Argın et al. in Kahramanmaraş, no statistically significant difference was found between factors such as whether the parents were mothers or fathers, age, education level, income status of the families, and number of children (11). In our study, 77.2% of the participants stated that the parents decided to vaccinate the child together. In the study conducted by Özlem, similar to our study, 77.8% of the participants stated that the parents decided together (12).

Of the participants, 88.6% stated that side effects such as fever, muscle and headache may occur after vaccination, and 75.9% stated that cold application and painkillers could be given to alleviate the side effects. In the study conducted by Derince, it was found that 80% of children developed mild side effects such as fever and tenderness at the injection site after vaccination, and 64.4% of families gave antipyretics to alleviate side effects. Derince also found that families were less familiar with other methods such as warm showers, cold application,

and drinking plenty of fluids to combat fever. He stated that explaining the side effects seen after vaccination and coping methods to families would be important in preventing families from not vaccinating their children for simple reasons (13). In a study conducted by İlder et al. in Konya province with families who refused vaccines for various reasons, more than half of the families (68.8%) refused vaccines because they thought that vaccines contained harmful substances (18). Similar to our study, the participants mostly refused vaccines because they thought that vaccines contained harmful substances.

To the statement "When is the first vaccine given to a newborn baby?", 11.4% of the participants gave the correct answer "at birth". In the study conducted by Uzuner et al., the rate of mothers giving the correct answer was found to be 64.4% (14). In the study conducted by Abiç in 2022, 53.7% of the parents answered the same question correctly (15).

It was observed that the participants were most familiar with measles (85.9%), varicella (75.9%) and rubella (66.4%) vaccines among childhood vaccines. Similarly, measles (71.5%) was the most commonly known vaccine in Göksüğüür's study (16).

Among the sources of information about vaccines, 10% of the participants stated social media, 10.5% scientific journals and articles, 36.4% healthcare professionals and 11.8% social environment. In the study conducted by Türkay et al., it was found that the participants received information mostly from healthcare professionals (41%) (17). In another study, 76.9% of the participants stated that they received information about vaccines from healthcare professionals and 18.9% from their social environment (14). According to the studies, parents receive the most information about vaccines from healthcare

Table 4. Comparison of parents' demographic data and vaccine information form scores

		Information scores	
		$\bar{x} \pm SS$	p
Sex	Female	15.01 $\pm$ 4.5	p< 0.05
	Male	11.41 $\pm$ 5.4	
Age	18-25	12.45 $\pm$ 3.62	p= 0.113
	26-30	13.46 $\pm$ 5.1	
	31-35	15.13 $\pm$ 4.8	
	36-40	14.34 $\pm$ 4.78	
	Over 41 years old	15.1 $\pm$ 5.11	
Occupation	Not working	14.36 $\pm$ 4.46	p= 0.350
	Officer	15.04 $\pm$ 4.98	
	Labourer	12.89 $\pm$ 5.2	
	Other	14.67 $\pm$ 5.38	
Spouse occupation	Not working (1)	11.62 $\pm$ 5.04	p< 0.05
	Officer (2)	14.14 $\pm$ 5.08	
	Labourer (3)	14.02 $\pm$ 4.66	
	Other (4)	15.64 $\pm$ 4.50	
Education	Primary school and below	15.33 $\pm$ 4.39	p= 0.453
	Middle school	14.81 $\pm$ 4.78	
	High school	14.43 $\pm$ 5.49	
	University	13.87 $\pm$ 4.73	
Spouse's education level	Primary school and below (1)	16.15 $\pm$ 4.11	p< 0.05
	Secondary school (2)	16.14 $\pm$ 4.06	
	High school (3)	14.80 $\pm$ 4.56	
	University (4)	12.91 $\pm$ 5.14	
Number of children	1 (1)	15.52 $\pm$ 4.44	p< 0.05
	2 (2)	14.03 $\pm$ 4.73	
	3 and above (3)	12.56 $\pm$ 5.49	
Total monthly income	0-3000 TL (1)	12.51 $\pm$ 4.3	p< 0.05
	3001-4500 (2)	13.61 $\pm$ 4.76	
	Over 4500 (3)	15.27 $\pm$ 4.91	
Existence of social security	Yes	14.45 $\pm$ 4.99	p= 0.292
	No	13.21 $\pm$ 3.43	
The parent who decides to vaccinate the child	Mom/Dad	12.80 $\pm$ 4.81	p< 0.05
	Mom and dad together	14.79 $\pm$ 4.82	

Table 5. Comparison of parents' attitudes towards vaccination according to demographic data

		General attitude towards vaccination		Thought subdimension		Attitude subdimension	
		$\bar{x} \pm SS$	p	$\bar{x} \pm SS$	p	$\bar{x} \pm SS$	p
Sex	Female	50.72 $\pm$ 8.31	0.455	24.53 $\pm$ 4.29	0.641	26.19 $\pm$ 6.22	0.198
	Male	49.63 $\pm$ 8.76		24.88 $\pm$ 4.31		24.76 $\pm$ 7.21	
Age	18-25	48.75 $\pm$ 7.23	0.050	25.3 $\pm$ 3.53	0.115	23.45 $\pm$ 6.21	0.073
	26-30	51.56 $\pm$ 8.57		24.5 $\pm$ 4.39		27.06 $\pm$ 6.04	
	31-35	48.45 $\pm$ 8.61		23.72 $\pm$ 4.63		24.73 $\pm$ 6.6	
	36-40	51.02 $\pm$ 8.46		24.49 $\pm$ 3.88		26.54 $\pm$ 6.74	
	Over 41 years old	53.0 $\pm$ 7.57		25.95 $\pm$ 4.09		27.05 $\pm$ 5.97	
Occupation	Not working	51.04 $\pm$ 7.14	0.400	24.48 $\pm$ 3.84	0.210	26.56 $\pm$ 5.67	0.261
	Officer	52.25 $\pm$ 10.6		26.11 $\pm$ 4.42		26.14 $\pm$ 7.78	
	Labourer	50.14 $\pm$ 7.77		23.82 $\pm$ 4.76		26.32 $\pm$ 5.62	
	Other	48.88 $\pm$ 9.51		24.46 $\pm$ 4.7		24.42 $\pm$ 7.28	
Spouse occupation	Not working	49.21 $\pm$ 8.06	0.709	23.97 $\pm$ 4.14	0.720	25.24 $\pm$ 6.39	0.803
	Officer	50.69 $\pm$ 10.01		24.24 $\pm$ 4.31		26.45 $\pm$ 8.12	
	Labourer	50.26 $\pm$ 7.61		24.68 $\pm$ 4.19		25.58 $\pm$ 5.92	
	Other	51.13 $\pm$ 8.54		24.88 $\pm$ 4.44		26.25 $\pm$ 6.25	
Education	Primary school and below	50.58 $\pm$ 9.5	0.133	24.3 $\pm$ 4.61	0.657	26.27 $\pm$ 6.57	0.147
	Middle school	53.96 $\pm$ 8.5		25.52 $\pm$ 3.41		28.44 $\pm$ 6.93	
	High school	50.38 $\pm$ 8.39		24.68 $\pm$ 4.41		25.7 $\pm$ 6.49	
	University	49.7 $\pm$ 7.87		24.41 $\pm$ 4.35		25.29 $\pm$ 6.14	
Spouse's education level	Primary school and below (1)	51.35 $\pm$ 9.18	p< 0.05	24.5 $\pm$ 4.19	0.087	26.85 $\pm$ 6.53	p< 0.05
	Secondary school (2)	52.52 $\pm$ 8.4		24.31 $\pm$ 4.14		28.21 $\pm$ 6.58	
	High school (3)	53.46 $\pm$ 8.15		25.78 $\pm$ 4.11		27.68 $\pm$ 6.12	
	University (4)	47.87 $\pm$ 7.49		24 $\pm$ 4.39		23.87 $\pm$ 5.97	
Number of children	1	50.84 $\pm$ 9.34	0.903	25.13 $\pm$ 4.43	0.315	25.72 $\pm$ 6.95	0.919
	2	50.28 $\pm$ 7.47		24.17 $\pm$ 4.2		26.11 $\pm$ 5.99	
	3 and above	50.35 $\pm$ 8.3		24.4 $\pm$ 4.15		25.95 $\pm$ 6.3	
Total monthly income	0-3000 TL (1)	48.57 $\pm$ 6.72	0.051	23.46 $\pm$ 4.38	0.071	25.11 $\pm$ 4.64	0.218
	3001-4500 (2)	49.29 $\pm$ 7.65		24.18 $\pm$ 4.06		25.11 $\pm$ 6.04	
	Over 4500 (3)	51.74 $\pm$ 9.03		25.16 $\pm$ 4.31		26.59 $\pm$ 7.02	
Existence of social security	Yes	50.8 $\pm$ 8.34	0.110	24.59 $\pm$ 4.22	0.969	26.2 $\pm$ 6.35	p< 0.05
	No	47.58 $\pm$ 8.47		24.63 $\pm$ 5.08		22.95 $\pm$ 6.6	
The parent who decides to vaccinate the child	Mom/Dad	50.0 $\pm$ 7.94	0.620	24.24 $\pm$ 4.67	0.506	25.76 $\pm$ 5.6	0.839
	Mom and dad together	50.67 $\pm$ 8.53		24.7 $\pm$ 4.18		25.97 $\pm$ 6.66	

professionals. Therefore, healthcare professionals are the most important factor that can positively affect parents' attitudes towards vaccination.

Conclusion

In this study, which we conducted to measure parents' knowledge and attitudes towards childhood vaccines, it is important that the Ministry of Health informs the public

about the importance of childhood vaccines through media outlets and social media, develops policies to raise awareness of parents, and encourages health personnel, from whom families most frequently receive information about vaccines, to provide continuous training on childhood vaccines and to develop sensitivity in order to protect the gains to be achieved with vaccination.

Ethics Committee Approval: This study approval was obtained from Ege University Medical Research Ethics Committee (Decision no: 21-7T/3, Date: 08.07.2021).

Informed Consent: Patient consent was obtained.

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