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ORIGINAL ARTICLE

Evaluation of Mothers' Perspectives on Childhood Vaccination During The Covid-19 Pandemic

Covid-19 Pandemisi Sırasında Annelerin Çocukluk Çağı Aşıları Hakkındaki Bakış Açılarının Değerlendirilmesi

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ABSTRACT

Objective: The COVID-19 pandemic, which clearly showed how the availability of a vaccine could impact lives around the world, may also have changed mothers' perspectives on childhood vaccines. This research was conducted to evaluate mothers' perspectives on childhood vaccination during the COVID-19 pandemic.
Methods: This descriptive study was conducted 1-15 June 2020 in Turkey. The study was completed with 455 mothers. A descriptive information form and the "Attitudes towards Vaccination Scale" were used. Independent sample t-test and ANOVA were used to compare quantitative data as well as descriptive statistical methods.
Results: Of the mothers, 96% (n=437) stated that they had their child/children vaccinated regularly. It was found that 4% of the mothers had a negative attitude; 61.8% had a positive attitude toward vaccination. The top three reasons why mothers who partially or never had their children vaccinated were side effects, negative experiences with vaccination and the foreign origin of the vaccines. The COVID-19 outbreak had a positive impact on the attitudes of 19.3% of mothers towards vaccination, and a negative impact on 9%.
Conclusion: The results of the study showed that the majority of mothers had a positive attitude towards vaccination. However, there are still mothers who do not have their children vaccinated. Health institutions and government organizations should continually stress the importance of vaccination on different platforms, not only for health crises such as the COVID-19 pandemic, but always, and following scientific recommendations.

Keywords: Childhood Vaccine, COVID-19, Vaccination, Vaccine Rejection

ÖZ

Amaç: Bir aşının varlığının, tüm dünyadaki yaşamları nasıl etkileyebileceğini açıkça ortaya koyan COVID-19 salgını, annelerin çocukluk çağı aşılarına karşı bakış açısını da değiştirmiş olabilir. Çalışmanın amacı COVID-19 pandemisi sırasında annelerin çocukluk çağı aşıları hakkındaki bakış açılarını değerlendirmektir.
Yöntem: Bu tanımlayıcı çalışma 1-15 Haziran 2020 tarihinde Türkiye'de yapılmıştır. Çalışma 455 anne ile tamamlanmıştır. Tanımlayıcı bilgi formu ve "Aşıya Yönelik Tutum Ölçeği" kullanılmıştır. Tanımlayıcı istatistiksel yöntemlerin yanı sıra nicel verileri karşılaştırmak için bağımsız örneklem t testi ve ANOVA kullanılmıştır.
Bulgular: Annelerin %96'sı (n=437) çocuğuna/çocuklarına düzenli olarak aşı yaptırdığını belirtmiştir. Annelerin %4'ünün aşılara yönelik olumsuz tutuma sahip olduğu; %61.8'inin ise olumlu bir tutum içinde olduğu bulunmuştur. Çocuğuna kısmen ya da hiç aşı yaptırmayan annelerin ilk üç nedeni yan etkiler, aşı ile ilgili olumsuz deneyimler ve aşıların yabancı kaynaklı olmasıdır. COVID-19 salgını, annelerin %19.3'ünün aşıya yönelik tutumunu olumlu, %9'unu ise olumsuz yönde etkilemiştir.
Sonuç: Araştırmanın sonucu, annelerin büyük çoğunluğunun aşılamaya karşı olumlu bir tutum içinde olduğunu göstermiştir. Ancak hala çocuklarına aşı yaptırmayan anneler bulunmaktadır. Sağlık kurumları ve devlet kurumları aşının önemini sadece COVID-19 pandemisi gibi sağlık krizleri anında değil her zaman farklı platformlarda vurgulamalı ve bilimsel tavsiyelere uymalıdır.

Anahtar Kelimeler: Çocukluk çağı aşıları, COVID-19, Aşılama, Aşı reddi

1.Introduction

Vaccination is one of the leading methods of preventing deadly diseases (1). It is the most effective, safest, and least costly way to protect infants and children from many diseases and ensures healthy growth and development (2,3). Türkiye was able to eradicate polio by 2002 due to the successful implementation of vaccination programs. Moreover, neonatal tetanus, which is responsible for a high rate of mortality, has not been seen in Turkey since 2009. While the number of measles cases was 16.244 in 2000, this figure fell to only 9 in 2016 (4). However, with the increase in vaccine rejection in recent years, the number of cases has increased once again. According to World Health Organization (WHO) data, 2.904 measles cases were reported in Türkiye in 2019 (5). According to Türkiye Demographic and Health Surveys 2018 data, 67% of 12-23-month-old children and 72% of 24-35-month-old children in Türkiye had all age-appropriate basic vaccinations (6).

Parental confidence in vaccines is critical to the success of national immunization programs (7). While the number of families rejecting the vaccine in Türkiye was 183 in 2011, this number increased to over 10.000 in 2016 and

to over 20,000 in 2018 (8,9). If vaccine rejection continues at this rate of acceleration in our country, it is conceivable that there will be a significant increase in disease incidence after about 5 years and once-eradicated infectious diseases may occur again (8). In a study conducted in the U.S. (10), it was determined that 56.8% of measles cases had not been vaccinated. In a retrospective cohort study conducted in Colorado (11), it was stated that unvaccinated children were 22 times more likely than vaccinated children to contract measles and 6 times more likely to contract pertussis.

Studies conducted with families that are against vaccination (12-14) indicate that there are many factors that affect parents' decisions. These include factors such as negative experiences, the thought that vaccines contain harmful substances, the anxiety about the side effects of vaccines, the thought that their children are being vaccinated excessively and unnecessarily, and religious beliefs (12-14). In the study of Cıklar & Doner Guner (15), it was revealed that mothers believed that their children needed to be vaccinated but that they were anxious about the content of the vaccine and the conditions under which the vaccines were being stored. In a qualitative study with mothers who rejected the vaccine (16), it was reported that the most important factor impacting mothers' decisions was related again to a lack of confidence in the content of the vaccine. Burghouts et al. (17) found in their study that mothers who rejected the vaccine (37%) did so due to anxiety over potential side effects and the worry that children would have limited tolerance toward the vaccine. Ur Rehman et al. (18) reported that 80% of the mothers in their study were unaware that vaccination was necessary. This is an indication of how important it is to correctly inform and educate mothers so that the full vaccination process can be completed. Kajetanowicz & Kajetanowicz (19) stated that as a result of reduced morbidity and mortality rates in diseases for which immunization can be attained through vaccination, fear of the disease may dissipate in society, with the ensuing result that people may believe that there is no need for vaccinations. This can in turn elicit a decrease in vaccination rates.

In recent years, vaccine hesitation and rejection has been one of the most challenging subjects discussed. With the COVID-19 pandemic, however, and the deaths caused by the virus, the value of vaccination became clear to all concerned. This study was conducted at the beginning of the COVID-19 pandemic, at a time when a vaccine had not as yet been created and the world was in a state of anxious expectation. This atmosphere may have been responsible for changing mothers' outlook on childhood vaccines. This study seeks to evaluate mothers' perspectives on childhood vaccination during the COVID-19 epidemic.

The research questions of the study are as follows:

1- What are mothers' perspectives on vaccines during the COVID-19 pandemic?

2- What are the factors affecting mothers' attitudes towards vaccination?

2. Method

This descriptive, cross-sectional study was conducted via the internet due to pandemic. Mothers with children aged 0-18 were reached by simple random sampling method. The questionnaires have been created with Google.form. The system has a preventive feature in refilling the forms filled on the same account. They were shared with authors' profile between 1-15 June 2020 in Instagram and Facebook, two social media platforms that are very popular among mothers. A total of 455 mothers who consented to participate in the study and submitted the questionnaire were included in the study. Inclusion criteria were having a child between the ages of 0-18, being literate, and consenting to participate in the study.

2.1. Data collection tools

A descriptive information form and the "Attitudes towards Vaccination Scale" were used in the collection of study data.

Descriptive Information Form

The descriptive information form was prepared by the researchers in line with the literature (8,19,20). It includes questions about the socio-demographic characteristics of mothers and the vaccination status of children.

The Attitudes Toward Vaccination Scale

The "Attitudes Toward Vaccination Scale", which is used to determine social attitudes towards vaccination, was developed in 2017 by Cvjetkovic et al. (22). Turkish validity and reliability studies were carried out by Ozumit (20). The scale, consisting of 14 items in total, is a five-point Likert type of instrument. It comprises two factors: attitude and thought. A total score of between 14-32 on the scale is accepted as representing a negative attitude; a score of between 33-51 shows a moderate, while a score of between 52-70 is interpreted as revealing a positive attitude. The Cronbach alpha of the original scale was 0.90 with high internal consistency. The Cronbach a value of the Turkish validity and reliability scale was 0.853. The Cronbach a value of scale for this study was 0.90.

2.2. Statistical analysis

Whether the data obtained from the study showed normal distribution or not was evaluated with the Kolmogorov-Smirnov test. It was determined that the data showed normal distribution. The independent sample t-test and ANOVA as well as descriptive statistical methods were used to compare quantitative data (numbers, percentages, means, standard deviation). The results were evaluated at a 95% confidence interval and with a significance level of $p<0.05$.

2.3. Study Ethics

An informed consent form that provided the mothers with information about the study was obtained. Before the study was carried out, permission was received

from Ethics Committee (E-25403353-050.99-68536). Permission was also obtained for the scale that was used in the study.

3. Results

The study was completed with a total of 455 mothers. Of the mothers, 38 (8.4%) stated that their child had a chronic disease. The most common chronic diseases among the children in the study were asthma/allergic asthma and bronchitis. The characteristics of the participants are given in Table 1.

Table 2 shows the characteristics of the participants in the context of vaccinating children. A portion of 96% (n=437) of the mothers stated that they had their child/children vaccinated regularly. It was determined that 19.3% of the mothers had a positive opinion about vaccines after COVID-19, while 9% displayed a negative change in their opinions.

Table 1. Introductory Characteristics of Mothers

Descriptive characteristics		n	%
Age	20-29 years	91	20.0
	30-39 years	226	49.7
	Above 40	138	30.3
Educational Status	High School or Lower	123	27.0
	University or Above	332	73.0
Employment status	Working	310	68.1
	Not working	145	31.6
Place of Residence	Province	321	70.5
	County / Village	134	29.5
Family type	Nuclear family	437	96.0
	Extended family	15	3.3
	I live alone.	3	0.7
Income status	More income than expenses	111	24.4
	Income is equivalent to expenses	287	63.1
	Less income than expenses	57	12.5
Relationship status with spouse	We live together.	432	94.9
	We are separated.	19	4.2
	My husband died.	4	0.9
Total Number of Children	1 child	223	49.0
	2 children	186	40.9
	3 children	39	8.6
	4 or more children	7	1.5
Presence of chronic disease in the child	Yes	38	8.4
	No	417	91.6
	TOTAL	455	100

Table 2. Characteristics of Mothers in the Context of Vaccinating Children

		n	%
Status of whether children receive regular and timely vaccinations	Yes	437	96.0
	Some of my children yes, some of them no.	10	2.2
	No	8	1.8
Reasons for regular vaccinations[a€]	Because I believe it is necessary	304	69.5
	Because I think it protects from diseases	260	59.4
	Because I think it's necessary	44	10.0
Reasons for not being vaccinated or delaying it[∞€]	Side effects	12	66.6
	Negative experience	8	44.4
	The vaccine having a foreign origin	8	44.4
	Thinking that diseases will not cause problems	5	27.7
	Unnecessary	4	22.2
	Negative news in the press	3	16.6
	Choosing an alternative method	3	16.6
	Religious Belief	3	16.6
Vaccine-related information resources[€]	Healthcare workers	424	93.2
	Internet / social media	163	35.8
	Books	138	30.3
	Neighbor/friend	16	3,5
	Religious officials	2	0.4
Has the COVID-19 pandemic changed the mother's perspective on vaccination?	Yes, it has changed in a positive way	88	19.3
	Yes, it has changed in a negative way.	41	9.0
	No, there has been no change.	326	71.7

aThis was only answered by 437 mothers who had their children vaccinated regularly and promptly.

∞A total of 18 mothers responded, "some of my children yes, some of my children, no" (n=10 mothers) and "no" (n=8 mothers) to the question referring to the " status of children getting their vaccinations regularly and promptly."

€Since more than one option was answered, the total number and percentage of n is high.

Table 3. Sub-dimensions of Attitudes Toward Vaccination Scale and Total Score

	Med. (min-max)	X±SD
The "Attitude" sub-dimension	26 (6-30)	24.87 ± 4.19
The "Thought" sub-dimension	29 (8-40)	27.97 ± 6.20
Total Score of the Scale	54 (15-70)	52.84 ± 9.45

Table 4. Comparison of Mothers' Characteristics and Vaccine-Related Attitudes Scale Scores

Descriptive characteristics		X ± SD	df	F	p	Significant difference
Mother's age	20-29 years	52.12 ± 10.38	2/452	1.406	0.246	
	30-39 years	52.46 ± 9.73				
	Above 40	53.95 ± 8.23				
Family type	Nuclear family	52.95 ± 9.41	2/452	0.752	.472	
	Extended family	50.46 ± 10.43				
	I live alone.	49.00 ± 12.12				
Income status	More income than expenses	54.10 ± 10.20	2/452	2,915	0.055	
	Income is equivalent to expenses	52.84 ± 9.29				
	Less income than expenses	50.40 ± 8.36				
Relationship status with spouse	We live together. (1)	53.08 ± 9.40	2/452	3.300	0.038	1>2
	We are separated. (2)	47.42 ± 9.97				
	My husband died. (3)	53.00 ± 4.69				
Total Number of Children	1 child	53.10 ± 9.35	3/451	0.174	.914	
	2 children	52.50 ± 9.69				
	3 children	52.82 ± 9.14				
	4 or more children	54.00 ± 9.45				
Regular and timely vaccination of children	Yes (1)	53.62 ± 8.32	2/452	63.109	<0.001	1>2 1>3 2>3
	Some of my children yes, some of them no.(2)	43.60 ± 12.42				
	No (3)	21.75 ± 4.02				
Has the COVID-19 pandemic changed the mother's perspective on vaccination?	Yes, it has changed in a positive way.(1)	54.57 ± 7.63	2/452	32.958	<0.001	1>2 2<3
	Yes, it has changed in a negative way.(2)	42.19 ± 9.78				
	No, there has been no change.(3)	53.72 ± 9.03				

Note: *The p values were calculated using ANOVA. p<0.05 evaluated as significance level. df: degree of freedom*

Table 4 Comparison of Mothers' Characteristics and Vaccine-Related Attitudes Scale Scores (continue)

Descriptive characteristics		X ± SD	**t**	**p**	**Significant difference**
Settlement	Province (1)	53.63 ± 9.52	2.758	0.006	1>2
	Town/Village (2)	50.97 ± 9.03			
Mother's Educational Level	High School and below (1)	50.88 ± 7.72	-2.713	0.007	1<2
	University and above (2)	53.57 ± 9.93			
Mother's working status	Working (1)	53.65 ± 9.53	2.668	0.008	1>2
	Not working (2)	51.13 ± 9.07			
Presence of chronic disease in children	Yes (1)	49.84 ± 11.40	-2.055	0.040	1<2
	No (2)	53.12 ± 9.22			

Note: *The p values were calculated using independent sample t-test. p<0.05 evaluated as significance level.*

Table 3 shows the scores of the mothers on the sub-dimensions of the scale and the total score obtained from the scale. The study showed that the mean score of the mothers in the "Attitudes Toward Vaccination Scale" was 52.84±9.45. It was found that 4% of the mothers had a negative attitude, 34.3% had a moderate attitude, and 61.8% had a positive attitude.

The comparison of the descriptive characteristics of the mothers with the scores of the "Attitudes Toward Vaccination Scale" is given in Table 4. It was determined that there was a significant difference between the scale scores of the mothers in terms of place of residence, mother's education level, mother's employment status, cohabitation status, presence of chronic disease in the child, children's regular and timely vaccination, and opinions about the vaccine after the COVID-19 outbreak.

4. Discussion

In the study, 2.2% of the mothers stated that they did not have some of their children vaccinated, and 1.8% stated that they did not have any of their children vaccinated. Ozceylan et al. (23) asked mothers in their study, "Have you or your children ever been vaccinated?" and determined that the rate of those who had never been vaccinated was 6.17%. Gunes (24) found the overall vaccine hesitancy rate as 13.7%. It is stated in the literature (1,25) that the rate of vaccine rejection varies between 8% and 19%. The rate of not getting vaccinated in this study was lower than in other studies. This result suggests that vaccination awareness-raising activities carried out in the country are effective.

The study found that 69.5% (n=304) of the mothers stated that they had their children vaccinated regularly and promptly because they believed it was necessary; this result is similar to what is reported in the literature (26-29). In the study, the reasons why mothers did not have their children vaccinated regularly or did not have them vaccinated at all were stated as a consideration for the risk of side effects, negative experiences with vaccination, and the foreign manufacture of vaccines. Whyte et al. (31) found that the most common fears of parents were related to autism (96.2%), insufficient research or testing of vaccines (95.4%), and the possible presence of toxic components (92.9%). In another study (31) that examined the reasons for parental refusals to vaccination, it was determined that 75% refused because they believed in alternative treatments, and 25% did not believe in vaccines and were suspicious of their content. It was reported in the study of Topcu et al. (32) that parents refused the vaccine due to possible side effects such as autism and infertility. It has also been determined that parents believe that the risks of diseases that can be prevented by vaccines are lower than the risks of vaccination itself. The fact is, however, that side effects that may occur due to the vaccine constitute many times a lesser risk than complications that may occur due to the disease (8,33). Additionally, studies have proven that conditions such as vaccine-related autism (34-36) and infertility (37) have not been observed. At the same time, none of the ingredients in the vaccine are at a level that would harm children (33).

It was seen that almost all the mothers stated that they received information about the vaccine from health workers. It was further determined that they also received information from the internet/social media, books, neighbors/friends, and religious officials. It is reported in the literature (9,38,39) that parents' primary source of information about vaccinations is healthcare professionals. This reveals how important health workers are for the success of vaccination efforts. Health professionals should provide accurate and sufficient information to parents about vaccines, and parents should be informed so that they understand the importance of vaccines. This will contribute to increasing children's vaccination rates by reducing vaccine refusals.

It was determined in the study that the attitudes towards vaccination of mothers living in the small towns/villages were more negative ($p<0.05$). In the study of Schoeps et al. (40), the vaccination rate was found higher in the urban area. Generally, rural areas are seen as more disadvantaged areas in terms of education and health opportunities. In a study by Buyukkarakurt (41), it was determined that 11% of people living in rural areas had not heard of childhood vaccinations. It is an expected result that mothers living in the province have higher scores when it is considered that they have the opportunity to access education and health opportunities more easily.

It was found that mothers with a high school or lower education level had a more negative attitude towards vaccination. It has been determined in the literature (24,28,42,43), similar to our results, that as education level increases, the knowledge level and positive attitudes of parents about vaccines increase. It was found in one study (44) that the more educated mothers were, the more they understood the importance of childhood vaccination, which in turn accelerated vaccination rates. It was shown in another study (15) that the higher the level of education a mother had, the more this had a positive effect on her to have her children vaccinated. In a study by Ekiyor et al. (45), it was found that people with a higher level of education were more likely to consent to taking the COVID-19 vaccine. However, there are also studies (27,46) showing that the level of education does not affect attitudes towards vaccination. Based on the results of the present study, it can be said that individuals' vaccine awareness and consciousness were greater with the higher the level of their education.

It was revealed that working mothers' attitudes towards vaccination in children were more positive. Similar results were obtained in similar studies (46,47). This result may be related to the higher involvement of mothers with higher education in working life.

Another finding of the present study suggests that the attitudes of divorced mothers towards vaccination are more negative. No study could be found in the lit-

erature review comparing the state of being together with a spouse and the attitude score towards the vaccine. However, it has been revealed in the literature (48,49) that children from broken families are at risk of neglect and abuse. It has been suggested that this is because the stressful situation experienced by the family negatively affects their coping abilities, which in turn causes them to neglect the child. Considering that refusing vaccination is also a form of medical negligence, the result of the study can be evaluated in this context as well.

The attitudes towards vaccination of mothers with children who had a chronic disease were more negative in the study. Topcu et al. (32) determined that the rate of having a child with a health problem is higher among families that refuse the vaccine. Koseoglu et al. (50), on the other hand, determined that mothers of children with chronic diseases exhibited a higher rate of providing their children with paid vaccinations. The author asserted that this result stemmed from the fact that families of at-risk children were provided with information more frequently and therefore mothers acted more prudently to protect their sick children. The differences noted in the results of the various studies may be attributed to the fact that the research had been conducted in different populations or they may have stemmed from differences in the chronic illnesses that the children had. The fact that vaccines are not administered in flare-ups experienced in some chronic illnesses or during immunosuppressive therapy and other treatments may have contributed to this outcome. On the other hand, it is of vital importance that children with chronic illness be vaccinated. The results of the study demonstrate the importance of identifying children with a chronic disease and their mothers as an at-risk group so that vaccination education can be given a priority.

It was determined in the study that mothers who had their children vaccinated regularly and in promptly displayed more positive attitudes towards vaccination. Although this result is an expected one, it also shows that the mothers had the vaccines administered because they really believed that the vaccine was necessary. When mothers were asked about their reasons for having their children vaccinated regularly, they commonly answered "because I believe it is necessary," which also supports this conclusion. This result may be attributed to the fact that the realization that vaccines were responsible for reducing the number of deaths related to COVID-19 gradually spread out through the entire population.

The study revealed that 88 mothers (19.3%) who stated that their opinions about the vaccine changed positively after the COVID-19 pandemic were more positive than the others. The number of mothers whose opinions about the vaccine changed negatively after the COVID-19 pandemic was 41 (9%). In studies (51-53) conducted before the pandemic, it was determined that parents did not perceive infectious diseases as dangerous and therefore refused vaccination. It is however thought that the seriousness of the situation was understood after the COVID-19 outbreak. It was reported in Israel that when 60% of the population had been fully vaccinated against COVID-19, statistics showed that the daily case count fell from 11,000 to 135, and the number of deaths from 101 to 1. This is clear evidence of how important a tool vaccination can be in efforts to end a pandemic (54). These outcomes may provide guidance to healthcare personnel in their efforts to organize education programs for families who are vaccine-hesitant or reject it completely. Reminding families of how valuable the vaccine proved to be in preventing deaths and keeping COVID-19 under control may be a useful technique in convincing parents to change their minds about vaccination.

The mean score of mothers on the scale of attitudes towards vaccination in the study was 52.84±9.45, and it was found that the majority of mothers (61.8%) had positive attitudes. In Ozumit's (20) study, the mean score of the mothers was 53.28±8.74. In the study by Cvjetkovic et al. (22) with medical, law and engineering students, it was found that all students had a positive attitude (56.78±11.10), but medical students scored significantly higher than other students (59.52±9.62). It was determined in this study that 4% of the mothers had a negative attitude towards the vaccine and 34.3% had a moderate attitude. The scores are too high to be underestimated. In line with this finding, it can be said that there is a greater need in the country for awareness-raising campaigns for vaccinating children.

Conclusion and Recommendations

The results of the study showed that the majority of mothers had a positive attitude towards vaccination. However, it is worthy of note to mention that there are still mothers who do not have their children vaccinated. The COVID-19 outbreak had a positive impact on the attitudes of 19.3% of mothers included in this study towards vaccination, and a negative impact on 9%. The fact that 93.2% of the mothers in this study stated that they received information about the vaccine from healthcare professionals reveals how important the role of healthcare professionals is in this regard. Health professionals should guide families with appropriate training and information campaigns of preventing vaccine hesitation and rejection. The results of studies should be utilized in developing educational content, and priority should be given to groups that may be at risk.

Limitations of the study

Only mothers were included in the study as parents. Mothers with negative attitudes towards vaccination may have been more reluctant to participate in the research and may not have participated. Another limitation is that the study was carried out during the initial phase of the COVID-19 pandemic when the vaccine had as yet not been created.

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