

Original Article

Determination of Parents' Views on Vaccine Hesitancy and Its Causes and Childhood Vaccines

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Abstract

Background: Although childhood vaccines are safe and effective, vaccine hesitancy has become a global problem.

Objective: The aim of this study was to determine the opinions of parents about vaccine hesitancy and its causes and childhood vaccines.

Methodology: This descriptive and cross-sectional study was conducted with parents who applied to a State Hospital, Family Health Centers, and Community Health Centers in a provincial center in eastern Turkey. No sampling method was employed, as the study aimed to include the entire population. This approach ensured the highest possible number of volunteer participants. Data were collected using the socio-demographic characteristics form, and the "Scale of Vaccine Hesitancy." To maximize participation, the questionnaire forms were distributed electronically via Google Forms.

Results: The mean age of the parents was 35.10 ± 10.47 years and the mean number of children was 2.69. In addition, 52.9% were university graduates, 37% were civil servants and 55.2% were actively working. While 55.8% of the parents considered vaccination necessary, 80.5% thought that they would get sick more quickly if not vaccinated. Most participants (82.1%) reported that they had vaccinated their children before, and 79.8% stated that they did not encounter any problems after vaccination. Additionally, most parents (60.7%) indicated that vaccines have side effects, and 41.6% believed that vaccines cause autism. More than half of the families (58.8%) stated that they followed the complete routine vaccination schedule, while 85.7% expressed reluctance to receive multiple vaccines simultaneously. Some parents (21.1%) indicated that they held religious or cultural beliefs opposing vaccination, with 84.6% adopting the views of religious opinion leaders as a source. Furthermore, 92.3% acknowledged that these beliefs significantly influenced their vaccination decisions.

Conclusion: Parents' vaccine hesitancy scores were found to be at a moderate level. It was also observed that parents put forward different reasons for opposition to vaccination. It is predicted that nurses, who are an important member of the health care team, should help and guide families in the prevention of vaccine opposition, support and inform families on the issues they need.

Keywords: Child, Nurse, Parent, Vaccine, Vaccine hesitancy.

Introduction

Vaccination is an important protection method that protects infants and children from many diseases, disabilities and death (Salmon et al., 2015). Although this method has been practiced for years, individuals prefer not to vaccinate their infants and children for

various reasons (Wiley et al., 2020). Vaccine hesitancy is an important public health problem listed among the ten threats to global health (World Health Organization, 2019). The concept of "vaccine hesitancy", which has been increasing worldwide in recent years, has started to be seen in our country and

has the potential to be a significant danger if no measures are taken (Akbas Gunes, 2020).

Vaccine hesitancy threatens individual and public health. In the literature, it is reported that vaccine hesitancy has different causes and may be related to age, gender and cultural factors (Domek et al., 2018; Wiley et al., 2020). In addition to all these factors, a complete measure cannot be taken since the exact cause is not fully understood (Larson et al., 2011). It was determined that the number of unvaccinated children in Turkey was 12 thousand in 2016 and 23 thousand in 2017, and the number of children who were never vaccinated increased by 81% in the last 5 years (Buyuksoy, 2019). According to the 2018 data of the Ministry of Health, the number of parents who vaccine hesitancy was 20 thousand (Kader, 2019). The reasons why families vaccine hesitancy are listed as acting on hearsay, psychological problems, mistrust of vaccines, political or social concerns (Berry et al., 2017). Although the literature contains numerous studies on the reasons for parents' vaccine hesitancy, there is a lack of sufficient research specifically addressing individuals in eastern Turkey, where diverse sectarian beliefs and cultural values prevail (Anuk & Cetin, 2019; Sadaf et al., 2013). Therefore, there is a need for descriptive and cross-sectional studies to explore parents' reasons for vaccine hesitancy. Such studies can help promote informed and appropriate behaviors among parents regarding vaccines. This study aims to examine parents' perspectives on vaccine hesitancy, its underlying causes, and their attitudes toward childhood vaccines.

Materials and Methods

Type of Study: This study was a descriptive and cross-sectional study.

Place and Time: This study was conducted with parents who applied to the State Hospital in the city center of Bingol, located in eastern Turkey, and to the Family Health Centers and Community Health Centers in the same city center. Fieldwork was conducted between 21.11.2023 and 21.04.2024.

Population and Sample: The population of this study consisted of parents who applied to the State Hospital in a province in eastern Turkey and to the Family Health Centers and Community Health Centers in the same provincial center. No sample selection was

made in the study, and it was aimed at reaching the entire population. With this method, it was aimed to reach the highest number of volunteer participants that could be reached. After the study was completed, power analysis was performed using G*Power 3.1 package program and OpenEpi Version 3 program. In the literature, it has been reported that in such descriptive and cross-sectional studies, the number of individuals to be included in the study can be determined with an effect size of 0.5, an alpha level (α) of 0.05 and a power range of 0.80 ($1-\beta$) (Cohen, 1992). In the power analysis performed with 295 participants, the confidence interval was 95%, alpha was 5% and power was 80%.

Inclusion Criteria: All parents over 18 years of age, who were able to communicate in Turkish, who had children of the age at which childhood vaccinations should be administered, and who had the ability to complete questionnaires using electronic devices were included in the study.

Exclusion Criteria: Data of individuals who filled out the questionnaire inconsistently and incompletely were excluded.

Data Collection: The data were collected using the socio-demographic characteristics form, and the "Scale of Vaccine Hesitancy-VHS." To reach more participants in data collection, the questionnaire forms created through Google Forms were made suitable for online sharing. The link to the form was sent to the participants via social media applications such as WhatsApp, Telegram or via text messages and e-mails. Participants were asked to fill in the data collection tools after obtaining approval with the voluntary participation form created through the online survey.

Data Collection Tools-Socio-Demographic Characteristics Form: This form was developed by the researchers by utilizing the literature (Gur, 2019; Kader, 2019). This form includes questions such as the identity of the parent filling out the form, age, education level, occupation, employment status, number of children, presence of chronic and infectious diseases in their children, whether they consider it necessary to vaccinate their child, whether they have had their child vaccinated before, whether they have had problems with the vaccine(s) they have had before, their opinion on what kind of harm not vaccinating

can cause to the child, their opinion on the side effects of vaccines, whether they have the vaccines recommended in the routine vaccination schedule, and whether the vaccines are single or multiple.

Scale of Vaccine Hesitancy (VHS): It is a Likert-type scale (Kilincarslan et al., 2020) developed by the experts of the World Health Organization, Vaccine Strategic Advisory Group and Kilincarslan et al., (2020), with a long and a short form validated in Turkey (Kilincarslan et al., 2020). The scale items are answered as “strongly disagree”, “disagree”, “partially agree”, “agree” and “strongly agree”. A score between 21-105 is obtained on the long scale and between 12-60 on the short scale. It is stated that the higher the score obtained, the higher the opposition to vaccination. The long and short form Cronbach’s alpha values are 0.905 and 0.855, respectively (Kilincarslan et al., 2020). In this study, the short form of the scale was used. In this study, the Cronbach α coefficient of the scale was found to be 0.896.

Statistical Analysis: IBM SPSS Statistics 26.0 program was used to evaluate the data obtained in the study. A database was created, and error analysis of the data was performed. Descriptive statistics were used to analyze the data. The normal distributions of the variables were determined by Skewness and Kurtosis tests and independent groups t test and analysis of variance (ANOVA) analysis were used to analyze the data that met the conditions required for normal distribution. For non-normal distributions, non-parametric tests Mann Whitney U test and Kruskal Wallis H analysis were applied. The value of $p < 0.05$ was considered statistically significant in all analysis.

Ethics Committee Approval: Ethics committee approval was obtained from Bingol University Health Sciences Scientific Research and Publication Ethics Committee for the conduct of the study (25.10.2023-E.128954). In addition, the necessary institutional permissions were obtained from the Bingol Provincial Health Directorate to carry out the applications in the State Hospital of Bingol province and Family Health Centers and Community Health Centers in the same province (E-45082128-044-230273807). In addition, parents were informed about the purpose of the study, and their consent was

obtained before they were included in the study. The author(s) who conducted the Turkish validity, reliability and adaptation study of the Scale of Vaccine Hesitancy were contacted via e-mail, permission was requested for the use of the scale and approval was obtained. The entire process of this study was conducted in accordance with the principles of the Declaration of Helsinki. In order to ensure the confidentiality of the personal data collected, the answers data set were copied and stored on a separate computer after the data analysis was completed. The data obtained will be stored for five years in accordance with ethical rules.

Results

The average age of the parents who participated in the study was 35.10 ± 10.47 and the average number of children was 2.69. Of the parents who responded, 65.6% were mothers. Of the children in the immunization period, 58.1% were girls. Of the parents, 52.9% were university graduates, 37% were civil servants and 55.2% were actively working. The income level of 77.9% of the participants was medium and the family type of 85.4% was nuclear family. In addition, 65.3% of parents stated that they had children between the ages of 0-1. 90.6% of the participants did not have chronic diseases and 93.8% did not have infectious diseases. While 55.8% of the parents considered vaccination necessary, 80.5% thought that they would get sick more quickly if not vaccinated. 82.1% of the participants reported that they had vaccinated their children before and 79.8% reported that they did not encounter any problems after vaccination. 60.7% of the parents stated that vaccines have side effects and 41.6% stated that vaccines cause autism. 58.8% of the families reported that they received all vaccines in the routine vaccination schedule, while 85.7% did not want to receive multiple vaccines. It was reported that 21.1% of the parents had religious/cultural beliefs about opposition to vaccination, 21.1% adopted the views of religious opinion leaders as a source, and 84.6% reported that these beliefs were effective in their vaccination opinions (Table 1). It was determined that the scale of vaccine hesitancy scores of the parents ranged between 12-60 and the mean total score was 34.12 ± 9.12 .

Table 1. Mean scale scores according to some socio-demographic characteristics of parents (n=308)

Variables	n	%	VHS X±SD	Test (p)
Parents				
Mother	202	65.6	32.78±8.56	t=0.915
Father	106	34.4	36.78±10.10	p= 0.031
Sex of the child during the vaccination period				
Female	179	58.1	33.30±9.64	t=1.348
Male	129	41.9	34.72±8.70	p=0.179
Education level				
Illiterate ¹	15	4.9	36.05±9.28	X ² =4.002
Primary School ²	39	12.7	34.30±9.66	p= 0.036
Secondary School ³	39	12.7	34.86±7.41	1>2=3>4>5 ^c
High School ⁴	52	16.9	32.35±8.82	
University ⁵	163	52.9	30.66±8.68	
Occupation				
Officer ¹	114	37.0	32.26±10.17	F=0.338
Housewife ²	86	27.9	34.26±7.18	p= 0.023
Self-employed ³	108	35.1	34.55±9.41	3=2>1
Employment status				
Working	170	55.2	31.75±10.01	t=0.785
Not working	138	44.8	34.57±7.81	p= 0.033
Income				
Low ¹	39	12.7	35.51±7.30	X ² =8.525
Middle ²	240	77.9	34.48±9.09	p= 0.014
High ³	29	9.4	29.27±10.30	1=2>3 ^c
Family type				
Nuclear family	263	85.4	34.26±9.01	X ² =3.181
Extended family	35	11.4	32.2±9.62	p=0.204
Fragmented family (divorce, separation, etc.)	10	3.2	37.2±9.90	
Having a child between the ages of 0-1				
Yes	107	34.7	34.23±9.46	t=0.150
No	201	65.3	34.06±8.95	p=0.881
Chronic disease status in the child				
Yes	29	9.4	31.65±8.61	Z=1.076
No	279	90.6	34.27±9.17	p= 0.036

Infectious diseases in the child				
Yes	19	6.2	29.52±9.95	Z=1.981
No	289	93.8	34.42±9.01	p=0.048
Considering vaccination necessary				
Yes ¹	172	55.8	32.51±11.07	F=0.262
No ²	72	23.4	36.09±8.02	p=0.041
Undecided ³	64	20.8	35.62±9.56	2>3>1 ^d
Conditions that may occur if vaccinations are not given*				
Getting sick more easily ¹	248	80.5	32.72±6.31	F=8.525
Worse prognosis of diseases ²	110	35.7	34.45±7.33	p=0.026
Developing deadly diseases ³	91	29.5	34.16±4.52	5>4>3=2>1 ^d
Disability ⁴	48	15.6	35.98±7.12	
There won't be any harm ⁵	99	32.1	36.90±5.43	
Having vaccinated child before				
Yes	253	82.1	31.49±11.12	t=1.470
No	55	17.9	34.48±8.61	p=0.043
Problems with vaccines (n=253)				
Yes	51	20.2	36.60±8.08	t=0.464
No	202	79.8	33.08±10.58	p=0.036
Side effects of vaccinations				
Yes ¹	187	60.7	35.01±8.13	F=4.269
No ²	51	16.6	30.76±9.97	p=0.015
Undecided ³	70	22.7	34.71±9.07	1>3>2 ^c
Side effects thought to be caused by vaccines*				
Redness ¹	85	27.6	34.11±6.23	X ² =8.525
Pain ²	103	33.4	34.12±6.02	p=0.014
Infection ³	48	15.6	34.22±5.38	7>5=4>6>3=2=1 ^c
Infertility ⁴	29	9.4	36.85±3.53	
Fever ⁵	80	25.6	36.13±6.65	
Allergy ⁶	86	27.9	35.49±5.16	
Autism ⁷	128	41.6	37.28±6.45	
Receipt of all vaccinations in the routine vaccination schedule				
Yes. I've done it all ¹	181	58.8	30.81±8.13	X ² =2.321
No. they are missing vaccines ²	72	23.4	32.86±9.71	p=0.008
I did not have any of them done ³	33	10.7	36.63±9.88	3>4>2>1 ^c
I don't know/don't remember ⁴	22	7.1	34.12±9.12	

Which vaccinations you do not want to have				
Single vaccines	44	14.3	31.05±10.44	t=2.048
Multiple vaccines	264	85.7	34.61±9.38	p= 0.042
Religious/cultural beliefs about vaccine hesitancy				
Yes	65	21.1	36.72±8.55	t=0.444
No	268	78.9	34.03±9.21	p= 0.034
Source of religious/cultural beliefs (n=65)				
Opinion of religious opinion leaders	55	84.6	36.68±9.28	t=0.185
Opinion of family elders	10	15.4	32.03±9.21	p= 0.013
Impact of religious/cultural beliefs on vaccination thinking (n=65)				
Yes	60	92.3	35.41±8.49	t=0.185
No	5	17.7	32.46±9.44	p= 0.027
	X±SD			
Age	35.10±10.47			
Number of children	2.69±1.65			

*: Calculated considering multiple responses, ^c: Games-Howell test, ^d: Bonferroni test, VHS: Scale of Vaccine Hesitancy, X: Arithmetic mean, SD: Standard deviation, t: Student t test, F: ANOVA test, χ^2 : Kruskal-Wallis H test, Z: Mann-Whitney U test.

Table 2. Mean scores of parents on the Scale of Vaccine Hesitancy.

Scale	X	SD	Min.	Max.	Med.
VHS	34.12	9.12	12	60	36

VHS: Scale of Vaccine Hesitancy, Min: Minimum, Max: Maximum, Med: Median, X: Arithmetic mean, SD: Standard deviation.

Discussion

Vaccination is considered an important duty of parents (Wiley et al., 2020). In societies with low vaccination rates, there is a significant deterioration in the level of health (Helps et al., 2019). Vaccination should be given importance especially for the success of preventive practices, which is the basic principle of primary health care services (Akbas Gunes, 2020). In this study, it was aimed to determine the opinions of parents about vaccine hesitancy and its causes and childhood vaccines, and the findings obtained were discussed with the literature:

In the study, it was determined that the mean score of fathers' opposition to

vaccination was higher. Alhazza et al., (2022) reported that mothers had more positive attitudes about vaccinating their children than fathers. A similar result was reported in a study by Babicki et al., (2021). Akbas Gunes (2020) stated that men were more hesitant about vaccination. In the same study, it was reported that although women had a more positive attitude towards vaccination, they were more affected by the opinions of their close environment about vaccination. It was also reported that men had negative attitudes towards vaccines because they thought that vaccines could be harmful to the immune system. In this study, it was determined that the mean Scale of Vaccine Hesitancy score of

parents with a university degree was lower. In the study conducted by Salmon et al., (2005), it was reported that education level was effective in vaccinating children. Gellin et al., (2000) stated that parents should be educated to overcome problems related to opposition to vaccination.

In his study, Akbas Gunes (2020) stated that as the level of education increased, the opinion that vaccination became compulsory increased. Sandhofer et al., (2017) reported that low education level increased opposition to vaccination. There may be different reasons for this situation. Although it was not questioned in our study, the high tendency of low-educated individuals to use false or misleading information, which they often obtain without confirming its accuracy, may have affected the results. In some studies, it has been reported that the level of education does not affect the level of opposition to vaccination (Mohd Azizi et al., 2017). Occupation, which is another finding associated with education level, was found to influence vaccine opposition. It was determined that civil servant parents had lower mean Scale of Vaccine Hesitancy scores. Similarly, working parents were found to have a more positive attitude towards vaccines.

It was determined that the presence of chronic disease or infectious disease in the child affected the mean total score of the parents on the Scale of Vaccine Hesitancy scores. Sandhofer et al., (2017) reported that reasons such as fear of diseases, preventing disease prevalence and controlling the disease have an effect on vaccination. Bektas and Bektas (2023) reported that the general evaluation of vaccines may change during epidemics. Parents whose children are sick more frequently or have a history of infectious diseases are likely to have more information about the effectiveness of vaccines. Therefore, it is predicted that they have a more favorable view of

vaccines to prevent conditions that may negatively affect the general condition of their children and therefore score lower on the Scale of Vaccine Hesitancy scores.

It is known that the likelihood of vaccination is higher among parents who consider vaccination necessary. In this study, parents who vaccinated their children and considered it a necessity had a lower mean score. According to Mohd Azizi et al., (2017), the main reasons for vaccine refusal in the United States were listed as parents' lack of trust in vaccines, their perception of the risk of vaccine-preventable diseases, and their belief in the necessity of vaccines. Similarly, Sandhofer et al., (2017) reported that lack of knowledge about the benefits of vaccination, uncertainty, and unwarranted fears are barriers to achieving the desired vaccination rates. One of the important findings of this study is that parents who think that there will be no harm in the absence of vaccination have higher Scale of Vaccine Hesitancy scores. It is thought that parents with such erroneous information prefer not to have their children vaccinated, which may lead to disruption of preventive health services.

It was determined that the Scale of Vaccine Hesitancy scores were lower in parents who had vaccinated their children before and did not experience problems after vaccination. Rodriguez et al. (2023) reported that vaccine refusal was related to the perceived side effects of vaccination and that the rate of vaccine refusal increased in those who experienced complications after vaccination. Brown et al., (2010) reported that those who felt themselves at high risk due to side effects avoided vaccination. In our study, it was found consistent with the literature that those who believed that vaccines had side effects had higher Scale of Vaccine Hesitancy scores. In a study conducted by Omer et al., (2013), it was reported that the possible side effects of vaccines made the disease seem more

dangerous than the disease itself, and therefore parents avoided vaccines. Coniglio et al., (2011) reported that parents with positive attitudes towards vaccination were well informed about the side effects of vaccines and had awareness about the safety of vaccines. Parents who think that vaccines cause autism and infertility have higher mean scores of oppositions to vaccination. Kennedy et al., (2011) reported that low-income parents may refuse vaccination due to vaccine safety, autism or long-term health concerns. Although it has been reported that vaccination is not associated with autism (Hviid et al., 2019), it has been determined that parents do not vaccinate their children with such misconceptions. In a study conducted by Smith (2017), it was reported that 521 of the participants believed that vaccines could cause autism and therefore did not trust vaccines. In this study, 41.6% of the participants thought that vaccines cause autism. This rate is much higher than reported in other studies in the literature. Akbas Gunes (2020) found that 14.3% of the participants believed that vaccines cause autism. The mean scores of the Scale of Vaccine Hesitancy were found to be lower in parents who stated that they had received all vaccines specified in the routine vaccination schedule. Babicki et al., (2021) reported that there was a strong correlation between the parent's having received all vaccines and the desire to have their child vaccinated, and that 79% of parents wanted to have their children vaccinated, while 71.4% wanted to have it done as soon as possible. Awadh et al. (2014) reported that high vaccination rates can be achieved through parents' understanding of the importance of vaccination and their willingness to vaccinate their children. It is predicted that parents who believe that vaccination is an effective prevention method will not neglect the vaccination of their children.

It was determined that parents had a

prejudice about multiple vaccinations. It was determined that 85.7% of the parents did not want to receive multiple vaccines and these parents scored higher on the Scale of Vaccine Hesitancy. Akbas Gunes (2020) reported that approximately half of the participants were suspicious of the substances in vaccines and therefore distanced themselves from vaccines. Akbas Gunes, (2020), and Dubé et al., (2016) reported that 32% of parents were undecided or refused vaccines because they were concerned that the substances contained in vaccines could weaken their children's immune system. This suggests that with the increase in the number of ingredients in vaccines, parents develop a prejudice against vaccines and cause vaccine hesitancy.

One of the most important results of the study was that 21.1% of the parents were found to have religious/cultural beliefs about opposition to vaccination. It was found that these parents scored higher on the Scale of Vaccine Hesitancy scores. When the source of religious/cultural beliefs was analyzed, it was seen that 84.6% were influenced by the views of religious opinion leaders. In addition, it was reported that 92.3% of parents' religious/cultural beliefs had an effect on the thought of vaccination. Salmon et al., (2005) reported a relationship between vaccination status and parents' knowledge, attitudes and beliefs. In the same study, it was determined that parents of unvaccinated children were more likely to have beliefs questioning the safety and benefit of vaccination. Gellin et al., (2000) stated that individuals' main sources of information about vaccines can be either safe or unsafe. In a study conducted in Malaysia, it was reported that religious concerns and religious beliefs were among the concerns of parents about vaccines (Lim et al., 2016). Rodriguez et al., (2023) reported that perceived side effects of vaccination, religious beliefs, and negative emotions associated with

vaccines are important in vaccine refusal.

Conclusion: In this study, it was determined that parents did not have a desire for childhood vaccinations at the desired level, had misinformation about vaccines, and even individuals who had previously vaccinated their children did not see vaccines as a necessity. It was found that parents with religious/cultural beliefs about vaccination received a lot of information from religious opinion leaders and preferred not to vaccinate with this information.

Nurses and other health professionals should create educational content to reduce negative attitudes about vaccines offered within the scope of preventive health care and to prevent vaccine hesitancy. Media content should be carefully controlled to ensure that the public is not misinformed. Especially on platforms such as social media, where information spreads rapidly, simple and understandable content on vaccination should be included. Mobile applications to be developed can provide accurate information to the public. Targeted preventive measures should be implemented for high-risk groups to identify trends that increase vaccine hesitancy that may contribute to vaccine hesitancy.

Limitation: The cross-sectional design of the study, the fact that it was conducted with parents in only one province, and the fact that the results obtained can only be generalized to the province where the study was conducted are the main limitations. In addition, the reasons for vaccine hesitancy were tried to be determined using a self-report-based scale instead of the results obtained through detailed interviews. It is thought that it would be useful to use face-to-face interview methods in future studies and to determine the reasons for mistrust towards vaccines in detail.

Acknowledgements: This study is supported by the 2209-A University Students Research Projects Support Program with the number 1919B012302608 within the scope of the 1st semester of 2023.

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