

Evaluation of the Attitudes of Vaccination-hesitant Parents Towards Complementary and Alternative Medicine

Aşılama Reddi Yapan Ebeveynlerin Geleneksel ve Tamamlayıcı Tıp Uygulamalarına Yönelik Tutumlarının Değerlendirilmesi

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Abstract

Introduction: Although the vaccine has many individual and social benefits, ‘Vaccine Hesitancy’ has led to an increase in the number of vaccine-preventable diseases. The aim of our study is to determine the effect of ideas that cause vaccine hesitancy to comply with traditional medicine practices and drugs and to determine the ratio of parents’ preference for complementary and alternative medicine (CAM) methods.

Materials and Methods: This study was performed on the parents who refused vaccination in their children under the age of 8 between the years 2017-2022. Parents of the vaccinated children who were matched for age and gender were determined as the control group. Demographic characteristics of families, education levels, compliance ratios for well-child follow-up and pregnancy follow-up, preference ratios for traditional medicine and/or CAM applications were compared.

Results: A total of 123 families, 61 of whom were vaccine refusal and 62 of the control group, were included in the study. It was determined that the ratio of parents who refuse vaccination have increased in the last five years. The education level was found to be higher in the study group ($p=0.019$). The most common reasons for vaccine refusal were distrust of the vaccine content (72.1%) and non-compliance with religious beliefs (49.1%). It was also found that the ratios of prophylactic vitamin use and tetanus vaccination of mothers during pregnancy were lower in the study group ($p<0.01$). While the rate of compliance with vitamin D and iron prophylaxis for infants was lower in the vaccine refusal group ($p<0.01$), the ratio of preference for CAM was higher ($p<0.01$).

Conclusion: Vaccine hesitancy is a complex issue that affects public health, in which many individual, religious, political and sociological factors play a role. As with recent studies, this research shows that the most important reason for vaccine rejection is “lack of trust”. The higher education level in the vaccine refusal group may also be a sign of this distrust. Not only the rejection of the vaccine, but also the lack of use of vitamin drugs seems to be related to lack of trust. This may also cause CAM methods to be preferred more. These results show that providing trust in vaccination is the biggest step in the fight against vaccine hesitancy.

Keywords

Vaccine hesitancy, vaccine refusal, trust, complementary and alternative medicine

Anahtar kelimeler

Aşı tereddütü, aşı reddi, güven, geleneksel ve tamamlayıcı tıp

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Öz

Giriş: Aşının bireysel ve toplumsal pek çok faydası olmasına rağmen ‘Aşı Kararsızlığı’ aşıyla önlenebilir hastalıkların sayısında artışa neden oldu. Çalışmamızın amacı, aşı tereddütüne neden olan fikirlerin geleneksel tıp uygulamalarına ve ilaçlara uyum konusundaki etkisini belirlemek ve ebeveynlerin geleneksel ve tamamlayıcı tıp (GETAT) yöntemlerini tercih etme oranını belirlemektir.

Gereç ve Yöntem: Bu çalışma 2017-2022 yılları arasında 8 yaş altı çocuklarında aşıyı reddeden ebeveynler üzerinde yapıldı. Aşılardan çocukların yaş ve cinsiyet açısından eşleştirilen ebeveynleri kontrol grubu olarak belirlendi. Ailelerin demografik özellikleri, eğitim düzeyleri, sağlıklı çocuk takibi ve gebelik takibine uyum oranları, GETAT uygulamalarını tercih oranları karşılaştırıldı.

Bulgular: Çalışmaya 61’i aşı reddi, 62’si kontrol grubu olmak üzere toplam 123 aile dahil edildi. Aşılamaı reddeden ebeveynlerin oranının son beş yılda arttığı belirlendi. Çalışma grubunda eğitim düzeyi daha yüksek bulundu ($p=0,019$). Aşının reddedilme nedenleri arasında en sık aşı içeriğine güvensizlik (%72,1) ve dini inançlara uymama (%49,1) yer aldı. Ayrıca çalışma grubunda annelerin gebelikte profilaktik vitamin kullanımı ve tetanoz aşısı yaptırma oranlarının daha düşük olduğu belirlendi ($p<0,01$). Aşığı reddeden grupta bebeklere yönelik D vitamini ve demir profilaksisine uyum oranı daha düşük iken ($p<0,01$), GETAT tercih oranı daha yüksekti ($p<0,01$).

Sonuç: Aşı tereddütü, bireysel, dini, politik ve sosyolojik pek çok faktörün rol oynadığı, halk sağlığını etkileyen karmaşık bir konudur. Son yıllarda yapılan çalışmalarda olduğu gibi bu araştırma da aşı reddinin en önemli nedeninin “güvensizlik” olduğunu gösteriyor. Aşığı reddeden grubun eğitim seviyesinin yüksek olması da bu güvensizliğin göstergesi olabilir. Sadece aşının reddedilmesi değil, vitamin ilaçlarının kullanılmaması da güven eksikliğiyle bağlantılı gibi görünüyor. Bu da GETAT yöntemlerinin daha çok tercih edilmesine neden olabilir. Bu sonuçlar, aşıya güvenin sağlanmasının aşı tereddütleriyle mücadelede en büyük adım olduğunu gösteriyor.

Introduction

Vaccination is the most effective preventive health practice in the control of infectious diseases, and the World Health Organization (WHO) reported that 2-3 million deaths a year are prevented by vaccination programs (1). Although the vaccine has many individual and social benefits, the number of vaccine-preventable diseases has gradually increased since the emergence of the concept of ‘vaccine hesitancy’ in the 1990s (2). The World Health Organization (WHO) ranks vaccine hesitancy among the top ten threats to global health (3). The ‘SAGE Working Group on Vaccine Hesitancy’ defined it as ‘delaying in acceptance or refusal of vaccination despite availability of vaccination services, being complex and context specific, varying across time, place and vaccines and being influenced by factors such as complacency, convenience and confidence’ (4).

Among the main reasons for vaccine hesitancy are the notion that vaccines are harmful, the influence of religious beliefs, the idea that the immune system can control diseases, and that vaccines are unnecessary (5). A few previous studies have also reported the use of complementary and alternative medicine (CAM) as a factor associated with vaccine hesitancy (6). CAM has been defined as health approaches that are not considered part of traditional medicine and is becoming more popular as a form of health care. Relationships between CAM and hesitant perspectives

on vaccines have come to the fore as CAM practitioners and educators, as well as adults using CAM, have criticized vaccination, public health, and conventional medicine. A study from US showed that children who have previously used CAM areas that require contact with CAM practitioners are less likely to get the influenza vaccine (7). A recent study conducted in Turkey, examined the level of vaccine hesitancy of the parents, reported that 48% of the parents who refused the vaccine stated that ‘complementary medicine’ would be valid instead of the vaccine (8).

Compliance with other traditional health practices is also a matter of concern if the parent refuses the vaccine. As far as we know, there is no study in the literature investigating the compliance of parents who refuse vaccination with other practices of traditional medicine. The aims of our study are to determine the frequency and causes of vaccine hesitancy in parents, to examine the relationship between CAM and vaccine hesitancy and to reveal the attitudes towards traditional medicine practices and drugs.

Materials and Methods

Study Design

This cross-sectional descriptive study was conducted between 01.01. 2021 and 01.04. 2022 in Afyonkarahisar, Turkey. It was conducted on parents with children under 8 years old and approved by local

ethics committee of Afyonkarahisar Health Sciences University (04.2.2022, decision no: 2022/79). Written and verbal informed consent was obtained from each participant. All study procedures were performed in accordance with the Declaration of Helsinki.

Study Population

Study Group

The study group consisted of parents who refused vaccination in their children under the age of 8 between the years 2017-2022. After applying to Afyonkarahisar Provincial Health Directorate and obtaining permission, the contact numbers of the parents were requested. Out of a total of 205 parents who refused vaccination, only 85 could be reached by phone. Parents were informed about the study. As 24 of the parents did not want to participate, 61 parents were included in the study.

Control Group

Parents of 62 age- and gender-matched healthy children without any physical or psychiatric disease who applied to the pediatric outpatient clinic for the healthy child follow-up constituted the control group of the study.

Data Collection

Participants in the study group were surveyed by telephone, while those in the control group were administered a face-to-face survey. With the questionnaire consisted of three parts: 1) Sociodemographic characteristics of parents and their children 2) Pregnancy characteristics such as mothers' continuing the follow-up during pregnancy, getting tetanus vaccination, using folic acid, and having double and triple screening tests, place of birth, compliance with healthy child follow-up, compliance with national screening program practices and prophylaxis recommendations, and preferences for traditional and/or CAM medicine were questioned. While traditional medicine is defined as all modern medical practices recommended in hospitals and/or health centers, CAM medicine was defined as various health applications and products such as herbal teas, leech therapy, aromatherapy, apart from traditional medicine. 3) For the study group, it also includes a part that question the reasons for vaccine rejection and related behaviors.

Statistical Analysis

Descriptive statistics for the whole sample were generated as follows: Frequency for categorical variables, mean and standard deviation for continuous variables. Chi-square test was used to compare the percentage distributions of categorical data between the groups. The normal distribution of the data was evaluated by the Shapiro-Wilk test. Pairwise comparisons of continuous data were performed with Student's t-test. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) 20.0 package program. Values of $p < 0.05$ were considered as statistically significant.

Results

A total of 123 families, 61 of whom were in the study group, were included in this study. The comparison of the groups according to the general characteristics is shown in Table 1. There was no statistically significant difference between the two groups in terms of parental age, child age and gender ($p > 0.01$). The education level was found to be higher in the study group and it was statistically significant ($p = 0.019$).

It was determined that 35 (57.4%) of the children in the study group were vaccinated at least once, and 26 (42.6%) were never vaccinated after birth. It was determined that the number of vaccine refusals in children increased each year (Figure 1).

When the reasons for vaccine refusal were questioned, it was determined that the most common reason was thinking that the content of the vaccine was harmful 44 (72.1%). When the information sources that cause vaccine refusal were examined, it was

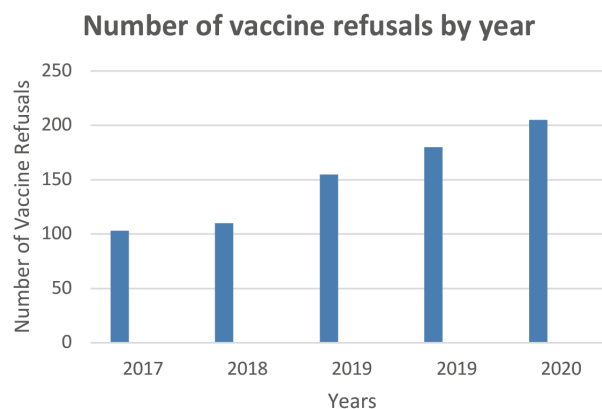


Figure 1. Number of vaccine refusals by year

determined that the most common source was social media with a ratio of 25 (48.1%). Reasons for vaccine refusal are shown in Table 2.

Comparisons of the groups in terms of compliance with prenatal and postnatal traditional medicine practices and use of CAM are seen Table 3. While there was no difference between the two groups in terms of regular follow-up during pregnancy ($p=0.077$), the ratios of prophylactic vitamin use and getting tetanus vaccination during pregnancy were found to be significantly lower in the study group ($p=0.019$, $p<0.001$; respectively). There were also no differences between the groups in terms of screening for developmental hip dysplasia, having newborn heel blood test and hearing test ($p>0.05$). Ratio of vitamin D prophylaxis usage and iron prophylaxis usage were

found to be significantly lower in the study group ($p=0.004$, $p=0.007$; respectively). When the groups were compared in terms of treatment choice for their child, using only CAM and using both traditional medicine and CAM was found to be significantly higher in the study group ($p<0.001$) While the parents in the study group reported that they used herbal tea, cupping and leech as CAM methods, it was found that the parents in the control group only used herbal teas. It was determined that 8 (57.1%) of the parents who used only CAM did not use traditional medicine because of religious belief and 6 (42.8%) because of the risk of side effects. There was also no significant difference between vaccine rejection due to religious beliefs and only CAM use ($p=0.926$).

Table 1. The comparison of the groups according to the general characteristics

Characteristics	Study group n=61	Control group n=62	p-value
Participant, mother, n (%)	51 (83.6)*	57 (91.9)	0.158
Age of parents; mean \pm SD (min-max), years	30.24 \pm 4.2 (22-39)	30.7 \pm 6.7 (20-47)	0.617
Age of children; mean \pm SD (min-max), months	24.0 \pm 15.1 (7-72)	28.4 \pm 20.9 (3-72)	0.227
Gender of child, male, n (%)	33 (54%)	29 (46.7%)	0.195
Education level of participants, high school or college, n (%)	53 (86.9)	43 (69.4)	0.019

*: Column percentage
SD: Standard deviation, min: Minimum, max: Maximum

Table 2. Reasons for vaccine refusal

Reasons	n (%)
Belief that the vaccine content is harmful	
It causes autism	44 (72.1%)*
It contain heavy metals and they cause hyperactivity	
Genetic products of other living things are transmitted during vaccine production	
It causes food allergy	
I don't know	
Belief that it is objectionable because of religious beliefs	
The vaccines contain pork products	30 (49.1%)
Distrust of the vaccine industry	
Because it is produced in foreign countries	10 (16.3%)
Pharmaceutical companies cheat us to make money	
Belief that vaccines do not protect	6 (11.1%)
Belief that vaccines are unnecessary	
People should become immune by catching the disease	6 (11.1%)
Due to the development of a post-vaccine reaction in a relative	3 (5.6%)

*: Row percentage

Table 3. Comparison of the groups in terms of compliance with prenatal and postnatal traditional medicine practices and use of CAM⁺

	Study group	Control group	
Prenatal	n=61	n=62	p-value
Pregnancy under follow-up, yes	58 (95.1%)*	62 (100%)*	0.077
Use of folic acid/multivitamin, yes	40 (65.6%)	52 (83.9%)	0.019
Getting tetanus vaccine, yes	25 (41.0%)	60 (96.8%)	<0.001
Having double or triple screening test, yes	16 (26.2%)	51 (82.3%)	<0.001
Postnatal			
Use of vitamin D prophylaxis, yes	51 (83.6%)	61 (90.3%)	0.004
Use of iron prophylaxis, yes	42 (68.9%)	55 (88.7%)	0.007
Screening for developmental hip dysplasia, yes	60 (98.4%)	58 (93.5%)	0.177
Having newborn heel blood test, yes	61 (100%)	62 (100%)	
Having newborn hearing test, yes	61 (100%)	62 (100%)	
Treatment choice for their child			<0.001
Only use of CAM ⁺	14 (22.9%)	2 (3.2%)	
Only use of traditional medicine	12 (19.7%)	52 (83.9%)	
Use of both traditional medicine and CAM ⁺	35 (57.4%)	8 (12.9%)	

*: Column percentage
CAM⁺: Complementary and alternative medicine

Discussion

Vaccination program is the most effective health service that protects public health by preventing communicable diseases. In order to prevent epidemics, the ratio of vaccination coverage should be above 95%. However, the concept of ‘vaccine hesitancy’ undermined the rate of vaccine coverage, has led to a decline in vaccination rates all around the world (5). Even in 2017, the rate of tetanus, pertussis and diphtheria vaccination decreased to 92% in Europe and 91% in America (9,10). It has been also reported that the number of vaccine rejection cases in Turkey reached 183 in 2011, 913 in 2013 and 23,500 in 2018 (5). As a result of this striking increase, the incidence of measles increased 10 times from 0.09 to 0.87 per hundred thousand population in 2018 in Turkey (11). In this study, it was determined that the number of vaccine rejection cases increased from 103 to 205 during the last five years. Although the ratio of vaccination coverage in Turkey was determined as 98% for 2018 (12) both previous national data and present study suggest that vaccine rejection cases may cause a decrease in the rate of vaccination in our country in the future.

The increasing number of vaccine refusal cases poses a risk to public health. In previous studies investigating the underlying causes of vaccine refusal,

low education level, young maternal age, and child neglect were reported as related factors (13,14). In this study, the parents who refused the vaccine and the control group were found to be similar in terms of age. However, the education level was found to be higher in the families who refused vaccination compared to the control group. Our study was compatible with other studies in the literature showing that vaccine hesitancy is more common in individuals with higher education levels (15-17). Previous studies reported that the main reasons for vaccine hesitancy were the claims that the substances in the vaccine were harmful, the financial concerns of the companies producing the vaccine, and it was possible to be protected from diseases by natural means (5). Claims that the mercury in the vaccine causes autism or that aluminum and other chemicals accumulate in the body and cause chronic diseases have led to the idea that vaccines are harmful. The ratio of belief that the vaccine content is harmful were reported as 35.9% in Australia (18), 74.7% in Sweden (19). In studies conducted in Turkey, this ratio was found to vary between 23.8% and 96.7% (15,16). Consistent with the literature, the belief that the content of the vaccine is harmful was found to be the most common reason in our study. Counseling families on these allegations seems to be the most important step in reducing vaccine rejection.

In this study, religion-related beliefs, such as the fact that vaccines contain pork products, were also found to be the second most common cause of vaccine rejection at a ratio of 49.1% and was higher than the ratios reported in previous studies in Turkey (13,15,20). It was thought that this result was due to the fact that our study was a local study. In recent studies, it has been shown that religious beliefs and religious leaders are effective on low vaccination rates in regions with a large Muslim population, and the belief that vaccines contain pork products has come to the fore as the reason for vaccine rejection (21-23). These findings suggest that health authorities should address the concerns of religious families by collaborating with religious leaders, religious communities and non-governmental organizations.

Distrust of the vaccine industry has also been reported as one of the common causes of vaccine rejection. In recent studies, the ratio of rejection due to this reason was reported as 23.1% in Austria, 68.8% in Korea, and 43.8% in Turkey (16,18,24). In this study, the ratio of distrust of pharmaceutical companies producing vaccines was found to be 16.3%. The main reasons for this lack of trust were determined as the production of vaccines abroad and the financial interests of the vaccine industry.

If vaccine hesitancy develops under the influence of distrust and religious beliefs, parents' compliance with other traditional medicine practices and their preference for CAM is another matter of curiosity. In studies conducted in Australia, it has been reported that CAM methods were seen as natural, side effect-free, non-profit methods of vaccine companies, reliable methods and were preferred more by families who refuse vaccination (6,25). This perspective overlaps with families who refuse vaccines. In a study conducted in our country, it has been also found that CAM methods were used more frequently by anti-vaccine parents (13). In this study, CAM preference was found to be significantly higher in parents who refused vaccination compared to the control group and no significant difference was found between vaccine rejection due to religious beliefs and using only CAM methods.

In a study conducted in Turkey in 2018, it was reported that families who refused vaccination had lower compliance with healthy child follow-ups

and were more prone to child neglect (13). In some studies in the literature, it has been stated that families who refuse vaccination should be evaluated in terms of child neglect (26). In this study, there was no difference between the groups in terms of compliance with newborn hearing screening, vision screening, and hip ultrasound screening. However, compliance with vitamin D and iron prophylaxis was found to be lower in parents who refused vaccination. For this reason, we think that parents who are anti-vaccine avoid drug treatments due to their lack of trust, just like in vaccine refusal, rather than neglecting their children. The higher education level of parents who refuse vaccination supports this idea. Present study also showed that anti-vaccine parents did not disrupt their prenatal follow-up, but the ratios of pregnancy tetanus vaccination and multivitamin use were lower. It was found that they used their own preferred herbal products instead of the preparations recommended by the doctor. Parents seem to be skeptical not only of vaccines, but also of other prophylactic treatments. This leads parents to use herbal treatments for both themselves and their children.

The strength of this study is that it is the first study to investigate the adherence of anti-vaccine parents to the recommendations for healthy child follow-up in the context of newborn screening and prophylaxis. The limitation of this study is that it questions the motivations underlying vaccine hesitancy, but not the motivations underlying the non-adherence to prophylaxis. This limitation should be taken into account in future studies.

Conclusion

Although vaccine hesitancy is a complex issue in which many individual, religious, political and sociological factors play a role, we think that the biggest underlying problem is absence of reliance. With this study, it has been revealed that anti-vaccine parents are not against traditional medicine practices, but have a problem of compliance with modern drug treatments. Whether it's a vaccine or another drug, parents seem to be wary of any substance that enters the body. This point should not be ignored in the approach to vaccine hesitancy, which has gradually become a major public health problem.

Ethics

Ethics Committee Approval: It was conducted on parents with children under 8 years old and approved by local ethics committee of Afyonkarahisar Health Sciences University (04.2.2022, decision no: 2022/79).

Conflict of Interest: None of the authors has any financial ties that might create a conflict of interest related to the content of the manuscript

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