The Relationship Between Fear of Injection, Vaccine Attitudes, And Vaccine Hesitancy: A Study on The Turkish Vaccine "Turkovac"

Enjeksiyon Korkusu, Aşı Tutumu ve Aşı Tereddütü Arasındaki İlişki: Türk Aşısı "Turkovac" Üzerine Bir Araştırma"

Mehmet Emin YAŞAR[1]* (iD) **, Fuat YALMAN**[2] (iD)

[1] Öğr. Gör., Bingöl Üniversitesi Solhan SHMYO Tıbbi Hizmetler ve Teknikler Bölümü, Bingöl, Türkiye
[2] Doç. Dr., Düzce Üniversitesi İşletme Fakültesi Sağlık Yönetimi Bölümü, Düzce, Türkiye

Abstract: This study aims to examine the relationship between blood-injection-injury phobia, attitudes towards COVID-19 Turkovac vaccine and hesitation regarding Turkovac vaccine. The study is a cross-sectional study conducted in the population. The research population consists of patients who applied to a family medicine clinic in the city center of Sakarya and their family members over the age of 18. The research data was collected from 574 participants through a face-to-face survey technique. IBM SPSS and AMOS programmes were used to analyse the data. The conclusions of the showed that the majority of participants had a low fear of injections and their attitudes and hesitancy towards the Turkovac vaccine was partially high. Furthermore, the empirical results of the study indicated that there was a strong positive correlation between attitudes towards Turkovac and hesitancy towards Turkovac vaccine, and a low negative correlation between injection fear and attitudes and hesitancy towards Turcovac vaccine.

Keywords: Fear of Injection, Vaccine Attitudes, Vaccine Hesitancy, Turkovac

Özet: Bu araştırma, kan-enjeksiyon-yaralanma korkusu, COVID-19 Turkovac aşısına karşı tutum ve Turkovac aşısına karşı tereddüt arasındaki ilişkiyi incelemeyi amaçlamaktadır. Çalışma toplum üzerinde yapılmış kesitsel bir araştırmadır. Araştırmanın evreni Sakarya il merkezindeki bir aile hekimliği birimine başvuran 18 yaş üzeri hasta ve hasta yakınlarından oluşmaktadır. Araştırma verileri yüz yüze anket tekniği ile 574 kişi üzerinden elde edilmiştir. Veriler IBM SPSS23 ve AMOS paket programları kullanılarak analiz edilmiştir. Araştırma sonuçları, katılımcıların büyük bölümünün enjeksiyon korkusu seviyelerinin düşük, Turkovac aşısına yönelik tutumlarının ve tereddüt durumlarının kısmen yüksek olduğunu ortaya koymuştur. Ayrıca araştırmanın ampirik sonucu, enjeksiyon korkusu ile Turkovac aşı tutumu arasında ve enjeksiyon korkusu ile Turkovac aşı tereddütü arasında düşük düzeyde bir negatif korelasyonun olduğunu; Turkovac aşı tutumu ile Turkovac aşı tereddütü arasında ise yüksek düzeyde pozitif bir korelasyonun olduğunu ortaya koymuştur.

Anahtar Kelimeler: Enjeksiyon Korkusu, Aşı Tutumu ve Aşı Tereddütü, Turkovac

1. Introduction

Preserving people's health and taking preventive measures against potential diseases is the fundamental goal of healthcare and the main duty of healthcare professionals. Prioritising the diseases that cause the greatest number of deaths and disabilities in the planning and delivery of health services should be the primary tactic for raising the overall level of health in the community. A person's illness is not only their personal condition, but also a social issue in the community in which they live. If the individual is not protected from illness, it also affects the society. In order to improve the health level of a society, the people living in that society should share the responsibility. Vaccine applications are one of the most effective public health methods to control infectious diseases and maintain health status. According to World Health Organisation statistics, 2.5 million children are saved from death every year thanks to vaccination and more than 100 million children receive vaccinations before they reach the age of one. Between 2000 and 2007, deaths from measles were reduced by 74%, and three of the six WHO regions were free of poliomyelitis infection (World Health Organisation 2009).

The American Center for Disease Control and Prevention (CDC) reports that millions of Americans are sick, unable to go to work, and unable to care for their children and elderly parents due to vaccine-preventable dise-

ases (National Foundation for Infectious Diseases, 2012). Again, according to US data, more than 50 thousand adults die every year in the USA from vaccine-preventable diseases such as pneumococcal, influenza and hepatitis B. This number is higher than the number of adults who die from vaccine-preventable diseases. This number is 14 times higher than the 300 child deaths from vaccine-preventable diseases (Healthy People, 2020).

One of the most powerful tools in the public health arsenal for promoting health and reducing the incidence of infectious diseases is the vaccine, which is a product that builds immunity against disease. Immunisation offers important socioeconomic benefits not only in the field of child health, but also in areas such as ensuring equity in society as a whole and strengthening health systems (UNICEF, 1996). Unlike other medicines, vaccines work on an individual and community level. No vaccine is 100% effective, however, when applied widely in the population, it is possible to reduce and eradicate diseases that can be controlled with vaccines (World Health Organization, 2014). The effectiveness of immunization is directly related to vaccination rates. It is clear that situations which reduce vaccination rates, such as vaccine hesitancy or resistance to vaccination, make it impossible to control vaccine-preventable diseases. Vaccination The effectiveness of immunisation is directly related to vaccination rates, it is clear that situations that will reduce vaccination rates, such as vaccine hesitancy or resistance to vaccination make it impossible to control vaccine-preventable diseases (Azap, 2018). Parents' resistance to vaccinations, in particular, increases the likelihood that children may contract diseases that can be prevented by vaccination and raises fears that infectious diseases will once again spread to the entire population (Dubé et al., 2013).

Vaccination is the creation of artificial immunity by giving weakened bacteria and viruses to the human body. Vaccination not only provides individual immunization, but also causes a decrease in the rate of exposure of unvaccinated people to the disease factor. As a result, the incidence of that disease in the community decreases. Therefore, vaccination programs are inexpensive and effective methods used to reduce the mortality and morbidity rates of various infectious diseases (Aggarwal, 2019; Dubé et al., 2016). Although the benefits of vaccination have been proven and well known in recent years, the number of hesitations and refusals by parents in childhood vaccinations is increasing. The term 'vaccine hesitancy' refers to a reluctance or delay in receiving a vaccine despite its availability. Vaccine refusal, on the other hand, is the case of not having all vaccinations voluntarily (Larson et al., 2015; Bozkurt, 2018).

A Lack of confidence in current vaccines and vaccination programs can negatively affect the vaccination decision. In addition to certain religious beliefs, the formation of doubts about the necessity of vaccination, worrying about the negative side effects that may be experienced,

the spread of false information about vaccines, and the situations where families and health workers doubt the necessity of the vaccine affect the choice of vaccination (Ward et al., 2016; World Health Organization Media Center, 2017). Depending on the context, time, place, and type of vaccination, a person's hesitation to get vaccinated can vary depending on their unique scenario (Hausman et al., 2014). According to a study, people who are apprehensive about getting vaccinated are those who attend trainings or are uninterested, go through challenging times or psychological issues, lead busy lives, and live independently (Rozbroj et al., 2019).

Intense anxiety and accompanying avoidance behaviors towards blood, needles, injury or medical applications are defined as blood-needle-injury phobia (Marks, 1988). Other types of specific phobias involve an increase in blood pressure and an acceleration of the heartbeat upon encountering the feared stimulus; in contrast, blood-needle-injury phobias involve an abrupt decrease in heart rate and blood pressure following an increase brought on by situations like giving blood and receiving a vaccination (Chapman & DeLapp, 2014). Lifetime prevalence is 3.5%; it is seen with a frequency of 0.8 to 1.5% in children and adolescents (Johnson, 2016). Blood-injection-injury phobia, also known as "blood-sickness" among the people, is the feeling of extreme fear when faced with situations such as seeing blood, getting an injection, ear piercing, dental treatment, other medical procedures, or bodily injury, accident, physical nausea, fainting, etc. İt is a reaction characterized by symptoms such as palpitations. Studies on the frequency of blood-injection-injury phobia, which mostly start in childhood, have shown that approximately 3-4 percent of the population is affected (Wardenaar et al., 2017).

Nichter (1995) categorised individuals' vaccine acceptance attitudes into two categories. These are active demand and passive acceptance. In this framework, individuals who are informed about the benefits of vaccination and confirm that they need vaccination are considered as active demanders, while individuals who comply with the majority or submit to authority are considered within the scope of passive acceptance. The concepts of trust and appropriateness have a very important place in addressing vaccination attitudes (Roalkvam et al., 2013). Appropriateness can be expressed as the peace of mind experienced when acting in line with the decisions taken by politicians (O'Neill, 2002). When trust and trustworthiness are not perceived, individuals and societies tend to rethink and reinterpret what is asked of them (Roalkvam et al., 2013).

In order to prevent the emergence of vaccine-preventable infectious diseases and to prevent outbreaks, a certain level of immunity must be achieved in the population. Vaccine refusal and vaccine hesitancy are among the main barriers to reaching the targeted immunisation levels, along with vaccine supply and distribution. Vaccine hesitancy is a complex situation that is specific to the perso-

nal circumstances of individuals and varies according to the environment, time, place and type of vaccine (Hausman et al., 2014). However, what is meant to be explained here is not only the meaning of the word, but also the underlying rationale and reasons (World Health Organisation, 2014). Vaccine refusal and vaccine hesitation, which have become increasingly prevalent in the world and in our country in recent years, threaten the health of all individuals in the society. Studies have shown that the most common reasons for vaccine refusal and vaccine hesitation are concerns about vaccine safety and side effects, and lack of knowledge and awareness about vaccination and its importance. In addition, the negative attitudes towards vaccines prevents reaching the targeted rates in COVID-19 vaccination, as in other vaccines (Akbulak & Çöl, 2022).

Blood-injection-injury phobia is strongly influenced by certain stimuli (e.g., blood), locations (e.g., hospitals), and procedures (e.g., blood draws, surgeries). There are situations such as fear of stimuli and events related to blood-injection-injury phobia, avoidance of blood tests, pain relief measures, and blood donation, even among healthcare workers, avoiding vital vaccines (Wright et al., 2009). Serious health problems may occur in individuals with blood-injection-injury phobia who delay recommended medical procedures and routine controls (Hamilton, 1995). The estimated lifetime prevalence of blood-injection-injury phobia is 3-5%, and it is more common in women than men (Agras et al., 1969). In a study conducted in the United Kingdom, approximately 10% of adults with COVID-19 vaccine hesitancy were found to have blood-injection-injury phobia (Freeman et al., 2021). It suggests that fears of blood-injection injury may contribute to attitudes and hesitation when the vaccine is injection dependent. The main aim of this study was to reveal the relationship between blood-injection-injury phobia, attitudes towards COVID-19 Turkovac vaccine and hesitation regarding Turkovac vaccine. Thus, the first hypothesis we investigated is this one: "H1: There is a statistically significant relationship between blood-injection-injury phobia, COVID-19 Turkovac vaccine attitudes and Turkovac vaccine hesitation."

2. Material and Methods

2.1. The style of the Study and the Profile of the Participants

This is a cross-sectional study. In this research, quantitative research design was used, using a face-to-face survey approach. Research was conducted between May and July 2022 among patients over the age of 18 and their families who registered to a family medical facility in the city center of Sakarya. Every participant received a thorough explanation of the purpose of the research prior to participation. At the same time, it was informed beforehand that all personal data will be kept confidential. It was made clear that taking part in the survey was entirely voluntary. In the end, 574 individuals' data were gathered and analyzed.

Purposive sampling was used for Sakarya province with a central population of 412,994. From previous studies, the standard deviation and margin of error for purposive sampling were determined as 0.6 and 0.0588, respectively. Sampling volume at 0.05 significance level in the study;

$$N=412994, \alpha = 0.05, \sigma = 0.51, Z_{0.05/2} = 1.96, d = 0.0588$$

$$n = \frac{N \cdot \sigma^2 \cdot Z_{\alpha/2}^2}{d^2(N-1) + \sigma^2 \cdot Z_{\alpha/2}^2} = \frac{412994 \cdot (0.6)^2 \cdot (1.96)^2}{(0.0588)^2(5000-1) + (0.6)^2 \cdot (1.96)^2} \cong 400$$

has been found.

2.2. Measurement Tools Used in the Research

There were five sections to the questionnaire. The primary goal of the study, the voluntary nature of participation, and the confidentiality of personal data were all covered in the first section. Expressions disclosing the participants' sociodemographic details were included in the second section. The two measurement instruments utilized in the study were presented in the third, fourth, and fifth sections. Only those who had previously received COVID-19 Turkovac vaccine were included in the study. Participants were asked about their general attitudes towards COVID-19 Turkovac vaccine and their hesitation regarding COVID-19 Turkovac vaccine.

2.2.1. Fear of Injection

The "injection fear scale" was used to assess the participants' levels of injection fear (Freeman et al., 2021). The concept of language equivalence is also called language validity in the literature. In the first stage, the researchers who developed the original scale were asked for permission for the adaptation process and 3-5 experts who know both the language of the original scale and Turkish very well were asked to translate the scale into Turkish separately. In the second stage, the translations made by the researcher and the translations made by the translation group consisting of experts were compared. During the comparison process, each item was analysed in terms of whether the translations were appropriate in terms of meaning. In the third stage, the scale translated into Turkish was given to a group of 3-5 experts who were experts in the language of the original scale and who were independent from the experts in the second stage, and these experts were asked to translate the scale from Turkish back into that language. Afterwards, the original wording of each item and the wording resulting from this translation were compared one-to-one. Finally, it was seen that the translation in the third stage and the original scale were compatible. The concept of language equivalence is also called language validity in the literature. In the first stage, the researchers who developed the original scale were asked for permission for the adaptation process and 3-5 experts who know both the language of the original scale and Turkish very well were asked to translate the scale into Turkish separately. In the second stage, the translations made by the researcher and the translations made by the translation group consisting of

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The COVID-19 Fear Scale, which was previously developed and adapted to Turkish after a validity and reliability study, was used.

2.2.2. Vaccine Attitudes towards "TURKOVAC" Vaccine

The "COVID-19 vaccine attitudes scale" was used to assess participants' views regarding COVID-19 (Shekhar et al., 2021). The concept of language equivalence is also called language validity in the literature. In the first stage, the researchers who developed the original scale were asked for permission for the adaptation process and 3-5 experts who know both the language of the original scale and Turkish very well were asked to translate the scale into Turkish separately. In the second stage, the translations made by the researcher and the translations made by the translation group consisting of experts were compared. During the comparison process, each item was analysed in terms of whether the translations were appropriate in terms of meaning. In the third stage, the

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2.2.3. Vaccine Hesitancy

The "vaccine hesitancy scale" was used to assess each participant's level of vaccine hesitancy (Shapiro et al., 2018). The items in the scale were subjected to expert review; ten experts with a strong knowledge base on the phenomenon being evaluated each item, and decisions on which statements to keep or remove from the scale were made by considering the conceptuconceptual framework. A pilot study was conducted on 20 people with the draft scale and errors such as expression errors in the items, misunderstanding by the respondents, spelling mistakes, spelling errors, etc. were corrected. For test-retest reliability, the draft scale was applied to 30 people twice with a 2-week interval and the total scores obtained from the scale are given below. The level (degree) of Pearson correlation coefficient between the first and second application is 0,83 (83%). In other words, there is a very strong (very high) positive correlation between the first and second application. The correlation coefficient found is also the stability coefficient. That is, the stability coefficient $\rho=0.83$. The fact that the stability coefficient is very high shows that the measurements made at different times are very similar. This shows that the scale is a very

stable scale. Since stability is also an indicator of reliability, the scale is highly reliable (Karagöz, 2021). In essence, the scale consists of 10 items. The scale was subjected to explanatory factor analysis and the scale questions consisted of a single dimension and 7 items. Seven items made up the questionnaire that assessed respondents' overall reluctance to receive vaccinations. A five-point Likert scale was used to assess the Turkish-language questionnaire. High scores indicated a strong reluctance to receive vaccinations. (0.966 is the Cronbach's alpha).

2.3. Statistical Analysis

For statistical analysis, the AMOS software and IBM SPSS23 were used. Descriptive analyses were first used to determine the participants' sociodemographic traits and the averages of the examined structures (relationships between vaccination hesitancy, vaccination attitudes, and injection fear). Lastly, the association between injection fear, vaccination attitudes, and vaccine hesitancy was examined using structural equation modeling (SEM) and the maximum likelihood estimation approach. That is, it was thought that vaccination hesitancy, vaccination attitudes, and injection fear were positively correlated (see Figure 1 for the suggested model).
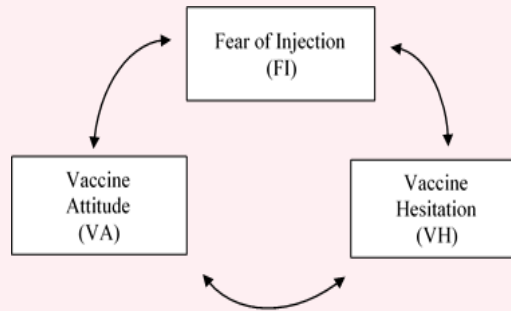

Figure 1. Theoretical model

3. Result

3.1. Results for Demographics and Descriptive Statistics

In the table below, there are t-test and ANOVA analysis results regarding the demographic characteristics of the participants, fear of injection, vaccine attitudes, and vaccine hesitancy (Table 1).

Table 1. The participants' sociodemographic characteristics

Variables	n	%	Fear of Injection		Vaccine Attitudes		Vaccine Hesitation	
			t Test/ Anova (t/F)	p-value (2tailed)	t Test/ Anova (t/F)	p-value (2tailed)	t Test/ Anova (t/F)	p-value (2tailed)
Gender								
male	274	47,7	-3,605a	<0,001	1,849a	0,065	2,356a	0,019
female	300	52,3						
Age								
18–25 years	154	26,8						
26-35 years	151	26,3						
36-45 years	104	18,1	5,909b	<0,001	4,713b	0,001	5,759b	<0,001
46-55 years	97	16,9						
>55	68	11,8						
Educational attainment								
primary/ secondary school	76	13,2						
high school	144	25,1	2,053b	0,105	0,913b	0,434	0,992b	0,396
university	297	51,7						
graduate	57	9,9						
Jobs								
employee	50	8,7						
officer	167	29,1						
retired	34	5,9						
housewife	72	12,5						
self-employment	33	5,7	3,761b	0,001	3,910b	<0,001	3,964b	<0,001
student	117	20,4						
unemployed	40	7,0						
private sector employee	61	10,6						
Origin of COVID-19								
man-made	391	68,1	2,641a	0,009	-5,899a	<0,001	-5,985a	<0,001
natural	183	31,9						

[a]Independent sample t-test
[b]ANOVA test

3.2. The Measures of Model Fit

The model fit of the research variables was demonstrated by comparing the model fit values considered in the literature (Table 2).

Table 2. Model Fit Measures

Measure	Estimate	Threshold	Interpretation
CMIN/DF	4.277	Between 1 and 5	between acceptable values
CFI	0.973	≥ 0.90	between the appropriate values
GFI	0.917	≥ 0.85	between the appropriate values
NFI	0.966	≥ 0.90	between the appropriate values
IFI	0.973	≥ 0.90	between the appropriate values
TLI	0.967	≥ 0.90	between the appropriate values
RMR	0.044	< 0,08	between the appropriate values
RMSEA	0.076	< 0.08	between the appropriate values

3.3. The Measurement Model's Results

The vaccination hesitation factors' path analysis results and model fit, vaccination attitudes, and injection fear are displayed in figure 2.
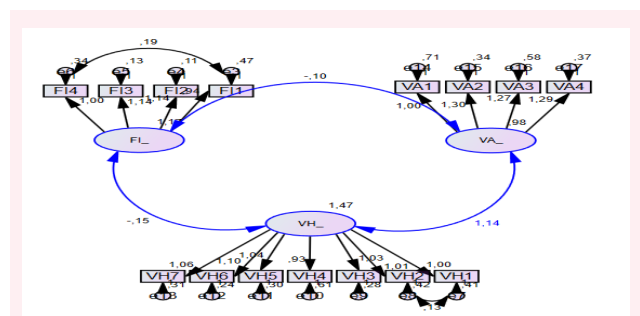

Figure 2. Model of the research

The analysis that was done led to the results that were presented for evaluating the validity and reliability of the research's measurement model, which showed that it was both (Table 3).

Table 3. The estimates of the items and the Cronbach's α, AVEs, and C.R.s of the constructs.

Constructs	Items	Estimate	Cronbach's α	Mean (±SD)	AVE	CR
Fear of Injection (FI)	FI4	,879	0.956	2,0832 (±1,18092)	0,827	0,950
	FI3	,959				
	FI2	,965				
	FI1	,828				
Vaccine Attitudes (VA)	VA1	,760	0.917	3,0431 (±1,25466)	0,738	0,918
	VA2	,911				
	VA3	,854				
	VA4	,903				
Vaccine Hesitation (VH)	VH1	,884	0.967	3,0669 (±1,26463)	0,806	0,966
	VH2	,884				
	VH3	,919				
	VH4	,822				
	VH5	,917				
	VH6	,939				
	VH7	,916				

AVE and CR values were obtained as a result of AMOS analysis. The research data and the research model fit each other quite well, according to the fit values. The structural model's outcomes are listed below (Table 4).

Table 4. Results of Pearson's Correlation Analysis

Variables	FI	VA	VH
Fear of Injection (FI)	-		
Vaccine Attitudes (VA)	-,080*	-	
Vaccine Hesitation (VH)	-,087*	,891**	-

* p<0,05; **p<0,0l

As a result; low negative correlation between injection fear and vaccine attitudes, low negative correlation between injection fear and vaccine hesitancy, and high-level positive correlation between vaccine attitudes and vaccine hesitancy.

4. Conclusion

This study aimed to determine the relationship between the COVID-19 vaccination attitudes and hesitations, which are explained by blood-injection-injury phobia in the adult population. The study is a cross-sectional study conducted on the population. The research population consists of patients who applied to a family medicine clinic in Sakarya City Center and their over-18 relatives. The research data were obtained from 574 people by face-to-face survey technique.

According to the correlation analysis results between vaccination hesitancy, attitude toward the Turkovac vaccine, and fear of injection, there is a low-level negative correlation between fear of injection and Turkovac vaccination attitude, as well as between fear of injection and Turkovac vaccination hesitancy. The results show a strong positive link between Turkovac vaccine attitude and Turkovac vaccine hesitancy

According to the correlation analysis results between vaccination hesitation, attitudes toward the Turkovac vaccine, and fear of injection; there is a low-level negative correlation between injection fear and Turkovac vaccination attitudes, and between injection fear and Turkovac vaccination hesitancy; The results show that there is a strong positive link between Turkovac vaccine attitudes and Turkovac vaccine hesitancy.

In various studies investigating the sociodemographic and sociocultural determinants of childhood vaccination rejection and hesitation; many factors have been found to be effective, including young age, religiosity and use of alternative medicine, and family lifestyle. Other factors; perceptions of the child's body and immune system; perceived disease risks, vaccine efficacy and side effects; vaccine safety concerns; perceived advantages were defined as previous negative experience with vaccination and social environment (Repalust et al., 2017; Smith et al., 2011).

According to a survey carried out in our nation, men had statistically more hesitations about vaccination. Again, in the same study, it was revealed that women are more affected by the vaccine hesitancy than the individuals around them (Gür, 2019). In another study, no significant difference was found in terms of gender regarding vaccine rejection and vaccine hesitations (Luyten et al., 2019). While men are more hesitant about being vaccinated; they also believe that over-vaccination may cause extra disease and may be harmful to the immune system (Azizi et al., 2017). In contrast, Campbell et al. (2017) revealed in their study that mothers are more likely to delay and refuse a vaccine than fathers.

Giambi et al. (2018) found that individuals over the age

of 35 experienced less hesitation. In a study conducted in Brazil, it was found that families did not trust the vaccine (41.0%), did not believe in its effectiveness (25.0%), or refraining from its side effects (24.0%) were associated with hesitancy towards the vaccine (Brown et al., 2018). Khaliq et al. (2017) reported that 21.3% of parents were worried about post-vaccine side effects, and 17.2% of them did not get vaccinated because they were afraid of their child getting sick due to the vaccine (Khaliq et al., 2017). In the study conducted by Arıcan (2019), 17.0% of the participants stated that the vaccines were not tested enough, 12.9% of them were afraid of the serious side effects of the vaccines, and 14.8% of them stated that they would not recommend their patients who are hesitant about the vaccine to be vaccinated.

Similarly, Giambi et al. in the study of (2018), vaccination hesitancy is higher in those who have a university or higher education. Gentile et al. (2021), in the study they conducted in Argentina, a significant relationship was found between the high education level of mothers and their hesitancy about vaccination. In contrast, Dasgrupta et al. (2018), higher vaccination hesitations were observed in mothers with less than five years of education. Unlike all these studies, there are also studies reporting that there is no relationship between education level and vaccine hesitancy (Argüt, 2019; Mutlu, 2021). The SAGE Vaccine Hesitancy Working Group reports that education level can both encourage and hinder vaccine acceptance, depending on current circumstances (Report of the SAGE Working Group on Vaccine Hesitancy, 2014).

This study has some limitations. The results cannot be generalized since the research was conducted in Sakarya province. Therefore, new studies can be done on different sample groups. In addition to the Turkovac vaccine, comparisons can be made by revealing attitudes towards other vaccine types. A new area of research entitled "The regulatory role of vaccine type in the relationship between injection fear, vaccine attitudes, and vaccine hesitancy" can also be identified.

ORCID

Mehmet Emin YAŞAR (0000-0001-8137-2946)

Fuat YALMAN (0000-0002-1041-1837)

Kaynakça

Aggarwal, A. (2019). Childhood vaccine refusal and hesitancy–reasons. The Indian Journal of Pediatrics, 86, 5-6.

Agras, S. W., Sylvester, D., & Oliveau, D. (1969). The epidemiology of common fears and phobia. Comprehensive Psychiatry, 10(2), 151–156. https://doi.org/10.1016/0010-440X(69)90022-4.

Argüt N. (2019). 12-60 ay arası çocuğu olan ailelerin aşılar hakkındaki bilgi, tutum ve uygulamalarının incelenmesi [Yayımlanmamış Yüksek Lisans Tezi]. İstanbul Üniversitesi, Sağlık Bilimleri Enstitüsü, Aile Sağlığı ABD Ana-Çocuk Sağlığı Bilim Dalı, İstanbul.

Arıcan, M. D. (2019). Sağlık çalışanları arasında aşılanmaya genel bakış, aşı kabulü ve reddini etkileyen faktörler. 4. Uluslararası Sağlık Bilimleri ve Aile Hekimliği Kongresi, 7-9 Şubat 2019, İzmir.

Bozkurt, H. B. (2018). Aşı reddine genel bir bakış ve literatürün gözden geçirilmesi. Kafkas Tıp Bilimleri Dergisi, 71.

Brown, A. L., Sperandio, M., Turssi, C. P., Leite, R., Berton, V. F., Succi, R. M., & Napimoga, M. H. (2018). Vaccine confidence and hesitancy in Brazil. Cadernos de saúde pública, 34, e00011618.

Campbell, H., Edwards, A., Letley, L., Bedford, H., Ramsay, M., & Yarwood, J. (2017). Changing attitudess to childhood immunisation in English parents. Vaccine, 35(22), 2979-85.

Chapman, L. K., & DeLapp, R. C. (2014). Nine session treatment of a blood–injection–injury phobia with manualized cognitive behavioral therapy: An adult case example. Clinical Case Studies, 13(4), 299-312. https://doi.org/10.1177/1534650113509304

Dasgupta, P., Bhattacherjee, S., Mukherjee, A., & Dasgupta, S. (2018). Vaccine hesitancy for childhood vaccinations in slum areas of Siliguri, India. Indian J Public Health, 62(4), 253-8.

Dubé, E., Laberge, C., Guay, M., Bramadat, P., Roy, R., & Bettinger, J. (2013). Vaccine hesitancy: An overview. Hum Vaccin Immunother, 9, 1763–1773.

Dubé, E., Gagnon, D., Ouakki, M., Bettinger, J. A., Guay, M., Halperin, S., ... & Canadian Immunization Research Network. (2016). Understanding vaccine hesitancy in Canada: results of a consultation study by the Canadian Immunization Research Network. PloS one, 11(6), e0156118.

Freeman, D., Lambe, S., Yu, L. M., Freeman, J., Chadwick, A., Vaccari, C., ... & Loe, B. S. (2023). Injection fears and COVID-19 vaccine hesitancy. Psychological medicine, 53(4), 1185-1195. doi:10.1017/S0033291721002609

Freeman, D., Lambe, S., Yu, L-M., Freeman, J., Chadwick, A., Vaccari, C., Waite, F., & Rosebrock, L. (2021). Injection fears and COVID-19 vaccine hesitancy. Psychological Medicine 1–11. https://doi.org/10.1017/S0033291721002609.

Gentile, A., Pacchiotti, A. C., Giglio, N., Nolte, M. F., Talamona, N., Rogers, V., ... & Castellano, V. E. (2021). Vaccine hesitancy in Argentina: Validation of WHO scale for parents. Vaccine, 39(33), 4611-4619.

Giambi, C., Fabiani, M., D'Ancona, F., Ferrara, L., Fiacchini, D., Gallo, T., ... & Rota, M. C. (2018). Parental vaccine hesitancy in Italy–results from a national survey. Vaccine, 36(6), 779-787.

Gür, E. (2019). Vaccine hesitancy-vaccine refusal. Turkish Archives of Pediatrics/Türk Pediatri Arşivi, 54(1), 1. https://doi.org/10.14744/TurkPediatriArs.2019.79990

Hamilton, J. G. (1995). Needle phobia: A neglected diagnosis. The Journal of Family Practice, 41(2), 169–175.

Hausman, B. L., Ghebremichael, M., Hayek, P., & Mack, E. (2014). Poisonous, filthy, loathsome, damnable stuff: the rhetorical ecology of vaccination concern. The Yale Journal of Biology and Medicine, 87(4), 403–416.

Healthy People (2020). http://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases Eri-

şim Tarihi: 09.08. 2024.

Karagöz, Y. (2021). SPSS-AMOS-META uygulamalı nicel-nitel karma bilimsel araştırma yöntemleri ve yayın etiği. Nobel Akademik Yayıncılık. E-ISBN: 978-625-402-278-4. Ankara.

Khaliq, A., Sayed, S. A., Hussaini, S. A., Azam, K., & Qamar, M. (2017). Missed immunization opportunities among children under 5 years of age dwelling In Karachi city. Journal of Ayub Medical College, Abbottabad: JAMC, 29(4), 645.

Larson, H. J., Jarrett, C., Schulz, W. S., Chaudhuri, M., Zhou, Y., Dube, E., ... & Wilson, R. (2015). Measuring vaccine hesitancy: the development of a survey tool. Vaccine, 33(34), 4165-4175.

Luyten, J., Bruyneel, L., & van Hoek, A. J. (2019). Assessing vaccine hesitancy in the UK population using a generalized vaccine hesitancy survey instrument. Vaccine, 37(18), 2494–2501. https://doi.org/10.1016/j.vaccine.2019.03.041

Marks, I. (1988). Blood-injury phobia: a review. The American journal of Psychiatry, 145(10), 1207-1213. https://doi.org/10.1176/ajp.145.10.1207

Mohd Azizi, F. S., Kew, Y., & Moy, F. M. (2017). Vaccine hesitancy among parents in a multi-ethnic country, Malaysia. Vaccine, 35(22), 2955–2961. https://doi.org/10.1016/j.vaccine.2017.04.010

Mutlu, M. (2021). Çocukluk çağı aşıları hakkında ebeveynlerin tutumları ölçeğinin Türkçe geçerlilik ve güvenilirlik çalışması [Tıpta Uzmanlık Tezi]. Atatürk Üniversitesi Tıp Fakültesi, Aile Hekimliği ABD, Erzurum.

National Foundation for Infectious Diseases. Adult Vaccination Saves Lives. (2012). Erişim: www.adultvaccination.org/resources/ctaadult.pdf. Erişim Tarihi 15.08.2024.

Nichter, M. (1995). Vaccinations in the third world: A consideration of community demand. Social Science and Medicine, 41(5), 617-632.

O'neill, O. (2002). Autonomy and trust in bioethics. Cambridge: Cambridge University Press.

Repalust, A., Šević, S., Rihtar, S., & Štulhofer, A. (2017). Childhood vaccine refusal and hesitancy intentions in Croatia: insights from a population-based study. Psychology, health & medicine, 22(9), 1045-1055. doi: 10.1080/13548506.2016.1263756.

Report of the SAGE Working Group on Vaccine Hesitancy 2014 [İnternet]. Erişim adresi:https://www.who.int/immunization/sage/meetings/2014/october/1_Report_WORKING_GROUP_vaccine_hesitancy_final.pdf Erişim tarihi:12.10.2022.

Roalkvam, S., McNeill, D. & Blume, S. (Eds.). (2013). Protecting the world's children: Immunisation policies and practices. Oxford: Oxford University Press.

Rozbroj, T., Lyons, A., & Lucke, J. (2019). Psychosocial and demographic characteristics relating to vaccine attitudess in Australia. Patient Education and Counseling, 102(1), 172–179. https://doi.org/10.1016/j.pec.2018.08.027

Shapiro, G. K., Tatar, O., Dube, E., Amsel, R., Knauper, B., Naz, A., ... & Rosberger, Z. (2018). The vaccine hesitancy scale: Psychometric properties and validation. Vaccine, 36(5), 660-667.

Shekhar, R., Sheikh, A. B., Upadhyay, S., Singh, M., Kottewar, S., Mir, H., ... & Pal, S. (2021). COVID-19 vaccine acceptance among health care workers in the United States. Vaccines, 9(2), 119. https://doi.org/10.3390/vaccines9020119

Smith, P. J., Humiston, S. G., Marcuse, E. K., Zhao, Z., Dorell, C. G., Howes, C., & Hibbs, B. (2011). Parental delay or refusal of vaccine doses, childhood vaccination coverage at 24 months of age, and the Health Belief Model. Public health reports, 126(2_suppl), 135-146.

UNICEF (1996). Vaccines bring 7 diseases under control. Erişim tarihi: 21 Eylül 2022. https://www.unicef.org/pon96/hevaccin.htm

Vaccine hesitancy determining the scale of the challenge (2016). Erişim adresi: https://www.who.int/immunization/research/forums_and_initiatives/2_SGoldstein_VH_Determining_Scale_challenge_gvirf16.pdf?ua=1 Erişim Tarihi: 20.08.2024.

Ward, J. K., Peretti-Watel, P., & Verger, P. (2016). Vaccine criticism on the internet: propositions for future research. Hum Vaccin Immunother, 12:1924-9.

Wardenaar, K. J., Lim, C. C., Al-Hamzawi, A. O., Alonso, J., Andrade, L. H., Benjet, C. D., ... & De Jonge, P. (2017). The cross-national epidemiology of specific phobia in the World Mental Health Surveys. Psychological Medicine, 47(10), 1744-1760. doi:10.1017/S0033291717000174

World Health Organization (2009). World Bank State of the World's Vaccines and İmmunization, 3rd Ed. Geneva, World Health Organization.

World Health Organization (2014). Report of the SAGE Working Group on vaccine hesitancy, 1.10.2014, Erişim Tarihi 22 Mayıs 2018, www.who.int/immunization/sage/meetings/2014/october/1_Report_WORKING_GROUP_vaccine_hesitancy_final.pdf.

World Health Organization Media Center. (2017). 1 in 10 infants worldwide did not receive any vaccinations in 2016. Available from: http://www.who.int/mediacenter/news/releases/2017/infants-worldwidevaccinations/en.

Wright, S., Yelland, M., Heathcote, K., & Wright, G. (2009). Fear of needles—Nature and prevalence in general practice. Australian Family Physician, 38(3), 172–176. https://doi.org/10.3316/informit.771566427388173