RESEARCH ARTICLE

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Evaluation Vaccine Hesitance of Syrian Migrants and Related Factors: The Example of Elazığ, Türkiye

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Objective: One of the important public health measurement is migrant vaccination. Therefore, the reasons for vaccine refusal among immigrants are worth investigating. The study aims to determine vaccine hesitance of Syrian migrants' and related factors.

Materials and Methods: The population of this study consists of Syrian immigrants living in the province of Elazığ. The median (minimum-maximum) values of the data were given, and Mann-Whitney U, Kruskal-Wallis tests were used for statistical evaluations. $p<0.05$ was accepted as statistical significance.

Results: Forty-four point three percent of the participants were male and 55.3% of them were married. The average age of the participants in the study was 35.00 years. Most of the participants declared to received information about the vaccine from the health staff. Two hundred and three of them who had the vaccines were included in the vaccination calendar because they believed the vaccine would protect them against diseases. Sixty-eight of them were not vaccinated because of the influence of their family elders. The vaccine hesitancy scale score and 1st sub-scale score among women were significantly higher than those of men. As the educational status and economic status increased, the vaccine hesitancy scale score and the scores of all sub-scales decreased significantly.

Conclussion: In this study, vaccine hesitancy scale and subscale scores were positively correlated with age, number of children, and duration of stay among immigrants living in Turkey. The findings suggest that the primary reason for vaccine refusal is a perceived sense of insecurity

Key Words: *Vaccine, hesitance, migrants, Vaccine Hesitance Scale*

Suriyeli Göçmenlerin Aşı Tereddüdünün Değerlendirilmesi ve İlgili Faktörler: Elazığ, Türkiye Örneği

Amaç: Önemli halk sağlığı göstergelerinden biri göçmen aşılamasıdır. Bu nedenle, göçmenler arasındaki aşı tereddüdü nedenleri araştırılmaya değerdir. Çalışma, Suriyeli göçmenlerin aşı tereddüdünü ve ilgili faktörleri belirlemeyi amaçlamaktadır.

Gereç ve Yöntem: Bu çalışmanın evreni Elazığ ilinde yaşayan Suriyeli göçmenlerden oluşmaktadır. Verilerin medyan (minimum-maksimum) değerleri verilmiş ve istatistiksel değerlendirmelerde Mann-Whitney U, Kruskal-Wallis testleri kullanılmıştır. İstatistiksel anlamlılık için $p<0.05$ kabul edilmiştir.

Bulgular: Katılımcıların %44.3'ü erkek ve %55.3'ü evliydi. Çalışmaya katılanların yaş ortalaması 35.00'dı. Katılımcıların çoğu aşı hakkında sağlık personelinden bilgi aldıklarını söyledi. Aşı olanlardan 203'ü aşının kendilerini hastalıklardan koruduğunu düşündükleri için aşı takvimine dahil edildi. 68'i ise aile büyüklerinin etkisi nedeniyle aşı olmadı. Kadınların aşı tereddüdü ölçeği puanı ve 1. alt ölçek puanı erkeklerden anlamlı olarak yüksekti. Eğitim durumu ve ekonomik durum arttıkça aşı tereddüdü ölçeği puanı ve tüm alt ölçek puanları anlamlı olarak azaldı.

Sonuç: Bu çalışma sonucunda Türkiye'de yaşayan göçmenler arasında yaş, çocuk sayısı, Türkiye'de kalış süresi açısından Aşı Tereddüdü Ölçeği ve Alt Ölçek Puanları pozitif korelasyonlar gösterdi. Aşı karşıtlığının temel nedeninin güvensizlik olduğu sonucuna varıldı.

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Introduction

The civil war in Syria, which began on March 15, 2011 has brought many changes to Turkey. The first and most influential of these changes is undoubtedly the migration mobility that started in that country and has affected many countries in the world. Since the uncontrolled and intense migration of Syrians to Turkey, polio, which has not been seen since 1998, has again started to pose–a risk again and other diseases are increasing in the same way (1).

Immigrant vaccination is an important public health measure. Vaccination of immigrants plays a critical role in preventing the spread of diseases and in protecting the most vulnerable people from infectious disease in the host countries. Immigrants due to economic distress, poor health conditions, lack of health services and vaccination programs, are generally more affected by vaccine-preventable diseases (2). The fact that Syria is among the few countries where polio is still prevalent and the movement of immigrants to our country represents a risk. Likewise, measles, a preventable pediatric disease, poses a risk for our unvaccinated children. The World Health Organization (WHO) reported that measles, and tuberculosis have been identified in Syrians immigrants in camps in Turkey (3). The Extended Program on Immunization (EPI) initiated by WHO for childhood vaccine-preventable diseases has also been implemented in Turkey and has been made effective with campaigns (4). The aim of EPI is to ensure that every baby is vaccinated in accordance with the determined vaccination schedule and that unvaccinated and incompletely vaccinated babies and children are identified and vaccinated (5). In our country, pertussis, polio, DTaP, Haemophilus influenzae type b, Hepatitis A, Hepatitis B, mumps, measles, rubella, conjugated pneumococcus, chickenpox, tetanus, tuberculosis vaccines are administered free of charge in health institutions within the scope of EPI (4). After the war in Syria, the diphtheria pertussis tetanus vaccination rate dropped from 95% and the measles vaccination rate from 80% to around 50%. 67% of polio cases and 39% of measles cases were seen in war-torn countries, including Syria (6). In Syria, due to the unrest and migration that began in 2011, the deterioration of the health system and the decrease in vaccination rates led to the detection of 35 poliomyelitis cases in 2013. It has been determined that the most common reason Syrian parents in Turkey do not vaccinate their children is the language barrier. The reasons for not vaccinating include not having ID records, lack of transportation opportunities, and not knowing where to apply (5).

Vaccine hesitancy is based on four interrelated topics: vaccine safety; vaccine efficacy; risk perception; and distrust of governments and health and scientific institutions (7-10). Anti-vaccination movement has been declared as one of the ten biggest global health threats of 2019 by WHO (11). Two of the most used arguments are the risk and danger related to mercury content in common vaccines, and the ongoing discussion related link between the measles, mumps, and rubella (MMR) vaccine and autism (12).

Demographic and other factors correlated with vaccine hesitancy comprise residing in a rural area, female gender, lower income, low education level, and vaccine costs (10, 13, 14). Several studies worldwide have documented that older individuals, females, those with higher education levels and higher incomes were more likely to accept a vaccine (15).

It is important to determine the factors that are effective in the emergence of vaccine hesitancy, since there are a serious risk in inadequate vaccination for citizen in countries accepting immigrants. The study aims to determine vaccine hesitancy of Syrian migrants' and related individual and social factors.

Materials and Methods

Research and Publication Ethics: Ethical approval was obtained from the Non-Interventional Research Ethics Committee of Fırat University prior to the study (17.07.2022-9602), and informed consent was obtained from the participants. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Sample Size: The population of this study consists of Syrian immigrants living in the province of Elazığ. As of 02.06.2022, 13,234 Syrian immigrants live in the province of Elazığ under temporary protection. With the Epi Info program, the minimum sample size was calculated as 250 with a 95% confidence interval and a 5% margin of error, and 273 individuals were reached in this study (16, 17). Participants were reached by going to the regions where Syrians live. Participants were informed that the information received by the researchers before starting the survey would not be used except from the scientific platform of this study.

Inclusion Criteria: Participation in the study was provided on a voluntary basis. Participants were selected from translators who knew Arabic and Turkish, and the questionnaires were filled through face-to-face interview technique.

Exclusion Criteria: Those under the age of 16, those with communication disabilities (hearing and speech impairments) and those who did not were not included in the study.

Developing the Questionnaire: The questionnaire, which was prepared by scanning the literature, was tested by pre-application on 12 immigrants. The questionnaire form consists of socio-demographic information, information about the vaccine and the scale of opposition to the vaccine. The Vaccine Hesitancy Scale (VHS) was developed by Kılınçarslan et al. in 2020 (18). 5-point Likert scale (1-totally disagree, 5-totally agree) was used for the research and it consists of 12 items and 3 sub-scales. The 1st, 2nd, 3rd, 4th and 5th items of the scale are reversely coded. The score range in the scale varies between 5 and 60, and high scores indicate that the individual's vaccine hesitance attitude level is high. In the study conducted by Kılıçarslan (19), it was stated that the Cronbach Alpha value of the scale was 0.855. When the reliability of the VHS was examined in the data obtained from the participants in the study, the Cronbach Alpha coefficient of the whole scale was 0.882 and for its sub-scales; Cronbach Alpha coefficient was 0.881 in vaccine benefit and protective value sub-scale (VHS Factor 1), Cronbach Alpha coefficient was 0.807 for anti-vaccine sub-scale (VHS Factor 2), and Cronbach Alpha coefficient was 0.635 for solutions for not being vaccinated sub-scale (VHS Factor 3). Construct validity for the three-scale structure of the VHS was tested with CFA and the statistical values of concordance obtained

as a result of the analysis are as follows; (χ2= 160,763; Sd=47; χ2/Sd=3,42; AGFI=0,908; GFI=0,945; CFI=0,955; RMSEA=0,073; RMR=0,055). As a result of the CFA, it was determined that the compliance statistics were acceptable and at a good level. In line with these results, it was concluded that the data obtained from the VHS were valid and reliable. This scale was preferred because it was developed in Turkey and has Turkish validity reliability.

Statistical Analysis: The data obtained as a result of the research were evaluated with the statistical package program. Normality analysis of numerical data was calculated through Kolmogrov Smirnov test. It was determined that the data did not show a normal distribution. The median (minimum-maximum) values of the data were given, and Mann-Whitney U, Kruskal-Wallis tests were used for statistical evaluations. p<0.05 was accepted as statistical significance.

Results

Forty-four point three percent of the participants were male and 55.3% of them were married. The average age of the participants in the study was 35.00 (16-82) and the average of their stay in Turkiye was 7.00 (1-19) years. The average number of children of these people was 5 (1-20). The average VHS score of the participants in the study was 29.00 (12-58). The distribution of the participants according to their socio-demographic characteristics and their anti-vaccine scores are given in Table 1.

Most participants (116) reported receiving information about the vaccine from health staff. Among them, 203 individuals who had been vaccinated were included in the vaccination records, as they believed the vaccine provides protection against diseases. Sixty-eight of them were not vaccinated because of the influence of their family elders. As the reason for not vaccinating, the majority stated that they were afraid that other diseases might arise due to vaccines in the future and they thought that the substances in the vaccine had harmful side effects (Table 2).

VHS score and 1st sub-scale (VHS Factor 1) score of women were significantly higher than among men. As the educational status and economic status (self-reported) increased, the VHS score and the scores of all sub-scales decreased significantly. VHS scores and Mean Rank values of all sub-scales were significantly higher for those who did not work than for those who worked and than those who did not have knowledge about the vaccine (self-reported). Similarly, the scores are higher for those who did not have the vaccination calendar compared to those who had the vaccine schedule, and those who did not want to receive information about the vaccine compared to those who wanted to know about the vaccine (Table 3).

Age, number of children, duration of stay in Turkiye (years), VHS and Subscale (Factors 1, 2, 3) Scores showed positive correlations (Table 4).

Table 1. Distribution of participants' sociodemographic characteristics and Vaccine Hesitance Scale (VHS) scores

				Total VHS		
		n	**%**	**Median**	**Min**	**Max**
Gender	Male	121	44.3	28	12	58
	Female	152	55.7	31	15	54
Education Status*	1	92	33.7	36	15	54
	2	93	34.1	27	15	57
	3	88	32.2	28	12	58
Marital Status	Married	151	55.3	28	12	57
	Single	89	32.6	28	15	58
	Others	33	12.1	37	19	54
Child Status	Yes	180	65.9	30	12	57
	No	93	34.1	28	15	58
Working Status	Yes	124	45.4	27	18	58
	No	149	54.6	32	12	57
Income Status	low	90	33.0	36	15	54
	middle	166	60.8	27	15	58
	high	17	6.2	22	12	41
Knowledge about vaccine	Yes	116	42.5	27	12	58
	No	157	57.5	34	15	54
Vaccine in Schedule	Yes	203	74.4	28	12	58
	No	68	24.9	42	16	54
	Some of them	2	0.7	37	36	38

*1= Primary School, 2= High School-Associate degree, 3= Under graduate-Post Graduate

Table 2. Distribution of answers given to some questions

		n	%
If education about vaccine yes (n=116) Who/Where	Health personnel	53	45.7
	friend/relative	9	7.8
	TV/social media	27	23.3
	School	26	22.4
	Clergy	1	0.9
If Vaccine in Schedule yes (n=203)	1 Because I believe vaccines are necessary	47	23.2
	2 Because I think vaccines are helpful	14	6.9
	3 Because I think it protects from diseases	111	54.7
	4 Because everyone around me has had their vaccinations	7	3.4
	5 Because I think it's mandatory	24	11.8
If you haven't had the vaccines in shedule, who was effective? (n=68)	1 myself	16	23.5
	2 my wife	8	11.8
	3 family elders	40	58.8
	4 Friends	2	2.9
	5 Clergy	2	2.9
If Vaccine in Schedule no (n=68) Why	1 I think that the substances in the vaccine have harmful side effects.	25	36.8
		1	1.5
	2 I think it is a sin because of my religious beliefs	12	17.6
	4 I do not believe the vaccine is helpful.	2	2.9
	5. I think vaccines are unnecessary.	2	2.9
	6 Because I think vaccines are meant to make money for pharmaceutical companies	26	38.2

Table 3. Variation of Vaccine Hesitance Scale (VHS) and Subgroup Scores (Factor 1, 2, 3) by Socio-demographic Characteristics

		VHS Factor 1		VHS Factor 2		VHS Factor 3		Total VHS	
		MR	*p*	MR	*p*	MR	*p*	MR	*p*
Gender	Male	119.98	0.001	134.44	0.630	127.91	0.088	125.32	0.029
	Female	150.55		139.04		144.23		146.30	
Child Status	Yes	140.02	0.297	140.71	0.214	144.49	0.019	141.67	0.129
	No	129.61		128.27		120.87		126.39	
Education Status*	1	172.61	<0.001	163.70	<0.001	171.02	<0.001	171.82	<0.001
	2	112.74		125.23		120.42		116.72	
	3	123.71		119.79		117.19		120.30	
Working Status	Yes	117.58	<0.001	125.43	0.026	126.72	0.049	120.75	0.002
	No	153.16		146.63		145.56		150.52	
Income Status	low	179.02	<0.001	178.51	<0.001	177.56	<0.001	184.17	<0.001
	middle	117.78		116.11		119.30		115.47	
	high	87.65		106.56		80.50		83.12	
Vaccine Knowledge	Yes	103.88	<0.001	106.83	<0.001	114.46	<0.001	104.63	<0.001
	No	160.76		158.56		152.89		160.20	
Vaccine in Schedule	Yes	111.22	<0.001	116.33	<0.001	114.66	<0.001	112.01	<0.001
	No	212.43		196.29		202.07		209.63	
	Some of them	188.75		218.75		192.00		204.00	
Information request about vaccine	Yes	98.30	<0.001	111.13	<0.001	107.90	<0.001	101.09	<0.001
	Unstable	173.68		155.83		160.23		168.06	
	No	191.48		179.67		182.74		190.83	

MR=Mean Rank, *1= Primary School, 2= High School-Associate degree, 3= Under graduate-Post Graduate

Table 4. The Relationship between Age, Number of Children, Time spent in Turkiye, and Vaccine Hesitance Scale (VHS) and Subscale Scores (Factor 1, 2, 3)

		Age	Child	Years in Turkey	Total VHS	Factor 1	Factor 2	Factor 3
Age	r	1	0.866**	0.194**	0.247**	0.226**	0.194**	0.284**
	p	.	<0.001	0.001	<0.001	<0.001	0.001	<0.001
Child	r	0.866**	1	0.299**	0.390**	.409**	0.339**	0.336**
	p	<0.001	.	<0.001	<0.001	<0.001	<0.001	<0.001
Years in Turkey	r	0.194**	0.299**	1	0.276**	0.275**	0.264**	0.213**
	p	0.001	<0.001	.	<0.001	<0.001	<0.001	<0.001
Total VHS	r	0.247**	0.390**	0.276**	1	.907**	0.846**	0.873**
	p	<0.001	<0.001	<0.001	.	<0.001	<0.001	<0.001
Factor 1	r	0.226**	0.409**	0.275**	0.907**	1	0.660**	0.725**
	p	<0.001	<0.001	<0.001	<0.001	.	<0.001	<0.001
Factor 2	r	0.194**	0.339**	0.264**	0.846**	0.660**	1	0.626**
	p	0.001	<0.001	<0.001	<0.001	<0.001	.	<0.001
Factor 3	r	0.284**	0.336**	0.213**	0.873**	0.725**	0.626**	1
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	.

Discussion

Vaccination has an important place in the protection of immigrant communities, who are among the disadvantaged groups in terms of public health against infectious diseases and should be part of a multi-faceted approach (20). Vaccination of immigrants is at risk in many societies and studies show that vaccination strategies need to be improved (21). By means of this study, it is thought that determining the factors affecting the emergence and prevalence of anti-vaccine attitudes in immigrants can contribute to the prevention of anti-vaccine attitudes.

Among the study participants, the number of men was higher than other studies, the percentage of women and men was close, and the average age was 35.00. Studies on immigrants in Turkiye have reported that it is difficult to reach the young male population (22). In this study, despite all the limitations, data from the young male immigrant population was obtained. This is one of the strengths of the study. The average VHS score of the participants in the study was 29 (close to half of the highest point 60). In a study conducted in Turkiye using the long form of the same scale, nurses' anti-vaccination scale score was 46.82 (close to half of the highest score 105) (23). The fact that the VHS of immigrants and local health workers were similar suggested that it could be associated with feeling safe in the country. Many Syrian immigrants stated that they had their children vaccinated according to the vaccination schedule in their own countries. The most common reason for not continuing to vaccinate in Turkey was stated as "language problem". Other reasons were identified as the lack of ID records, transportation difficulties, and not knowing where to apply (5). It is anticipated that immigrants in Türkiye will be vaccinated once they have access to vaccines. Considering the reasons why immigrants do not get vaccinated, EPI and other national campaigns on this issue are expected to increase vaccination among immigrants.

As the education and economic status increased, the VHS score and the scores of all sub-scales decreased significantly. Seeing the positive impact of education and accessibility will shed light on strategies to produce solutions in this area. VHS scores and scores of all sub-scales were significantly higher in those who did not have self-reported knowledge about the vaccine, those who did not have the vaccine calendar, and in those who did not want to receive information about the vaccine compared to those who wanted. In the study in which the VHS was used, the vaccine hesitancy score of those who did not know about the vaccine was found to be high (23). This shows that the lack of information about the vaccine poses a risk in terms of anti-vaccination and this information can be used to prevent vaccine rejection.

Similar to the other studies, the scale scores of those who had children were found to be lower (23). Among parents, vaccination hesitance were lower because they cared more about their children and researched their vaccinations.

In terms of staying duration in Turkiye, positive correlation of VHS and Subscale Scores were associated with an increase in confidence as they lived in the country.

In a study conducted in a Turkish population, vaccine hesitancy scores were higher among younger individuals, whereas in the present study, the VHS score increased with age (24). In this study, age and VHS score showed a positive correlation. This result shows the difference between the immigrant society and the native society.

In this study, the main reason for vaccine hesitancy was the belief that the substances in vaccines have harmful side effects and the fear that other diseases may arise in the future due to vaccination. Similarly, it has been observed that not trusting the vaccine is among the reasons for vaccine hesitancy (24). In addition, it has been determined that vaccine acceptance in other societies is associated with trust in the host country, and a reliable health care provider is the main factor determining vaccine acceptance and rejection (25). A study conducted in Lebanon found that Syrian immigrants were as compliant with mandatory vaccinations as local people. However, the vaccination rate of immigrants is lower than that of local people in non-compulsory vaccines (26). This can be explained by the fact that mandatory vaccines are free in Lebanon, while non-compulsory vaccines are charged. When vaccines are made available, immigrant compliance appears to increase.

As a result of this study, positive correlations were found between age, number of children, duration of stay in Türkiye, and VHS and subscale scores among immigrants living in Turkiye. It has been concluded that the main reason for vaccine hesitancy is insecurity. In addition, because VHS scores were higher among women, it is recommended that women, particularly those who are undereducated, elderly, and have children, should be considered priority groups for vaccination education for the health of immigrants and the wider community. Also campaigns should be carried out to increase access to vaccination among immigrants, and free and on-site services (where immigrants live) should be provided.

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