RESEARCH

COVID-19 VACCINE REFUSAL AND ASSOCIATED FACTORS: A POPULATION-BASED DESCRIPTIVE STUDY

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Abstract

Introduction: Since the declaration of coronavirus disease as a pandemic, the focus was shifted to developing a vaccine for combatting the pandemic. However, it is believed that the most significant obstacle to community immunity against COVID-19 is vaccine hesitancy and refusal. Therefore, we aimed to identify the proportion of COVID-19 vaccine refusal and associated factors in a population aged 55 years and over in the central district of Burdur Province.

Materials and Methods: In order to increase the rate of Covid 19 vaccination, the Ministry of Health has issued a declaration on the establishment of "vaccine persuasion teams." Accordingly, health personnel were assigned to call the people who were not vaccinated, to learn their opinions about the vaccine, to inform them about the vaccine and to persuade them to get vaccinated. According to the records, there were 1303 unvaccinated people aged 55 years and over as of June 2021 at survey site, namely Burdur Province-Turkey. A total of 349 people could not be contacted and 146 people hesitated to get vaccinated. Dependent variables were vaccine acceptance or strict refusal.

Results: We found that vaccine refusal was 1.75 (CI= 1.148-2.664) times higher among those with more than eight years of education and 2.37 (CI= 1.341-4.178) times higher among those obtaining vaccine information from sources other than their family physicians.

Conclusion: Overall, we discovered that the vaccine acceptance level was quite high among our participants. Relevant bodies may engage in community-based works to ensure public confidence in COVID-19 vaccines.

Keywords: Aged; COVID-19 Vaccine; Persuasive Communication; Vaccination Refusal.

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INTRODUCTION

Many of the diseases that have negatively affected human societies for thousands of years have begun to be treated, especially with the Industrial Revolution and the scientific tools that came with it, making it available to medicine. Many new approaches have been introduced in the field of preventive medicine. One of the revolutionary innovations is undoubtedly the vaccine. Thanks to the vaccination technique and vaccination policies developed during the twentieth century, it has become possible to combat epidemic diseases, most of which negatively affect children, especially smallpox. Massive application of vaccination has become one of the most basic functions of modern state organization, and it has become possible to fight the disease, to control the disease, and even to eradicate some of them completely from the world. However, since the 1990s in the world and the 2000s in Turkey, it is observed that parents have an attitude of hesitation, resistance or total refusal to have their children vaccinated (1).

When the massive spread of the coronavirus (COVID-19) was declared a pandemic, research shifted its focus to developing an effective vaccine to fight against the disease. Many vaccines were developed and approved at unprecedented speeds by the relevant bodies (2). Then, two main problems emerged: access to the vaccine and the capacity to create community immunity (vaccination of at least 60.0%–70.0% of the population) with vaccination (3,4). However, as in other pandemics, the most notable obstacles to creating community immunity against COVID-19 emerged as vaccine hesitancy and refusals. Insufficient information and conspiracy theories have been suggested as possible reasons for both vaccine hesitancy and refusal (5-7).

Since the vaccine cannot be supplied at once to cover the entire target population, the order of the groups to be vaccinated against COVID-19 was determined by Turkish Ministry of Health by evaluating the exposure to the disease, the risks of heavy transmission and transmission of the disease, and the negative impact of the disease on the social functioning.Vaccination studies in Turkey started on January 13, 2021 with the Sinovac vaccine. Biontech vaccine arrived in Turkey on March 24, 2023. The vaccination process was carried out through the Public Health Management System (HSYS) developed by the Ministry of Health and the AŞILA mobile application. The first Covid 19 vaccinations in Turkey were started from healthcare workers and people aged 85 and over. The vaccination of this age group was performed by the physician and allied health personnel by visiting house to house. In the following period, hospitals were included in the process by creating vaccine rooms, since the cold chain requirement of the Biontech vaccine was not suitable for mobile application. Vaccination applications continued according to age groups, and on April 16, 2021, the 55 age group was granted the right to be vaccinated (8, 9). However, vaccination levels did not reach the expected rates. In order to increase the rate of Covid 19 vaccination, the Ministry of Health has issued a declaration on the establishment of "vaccine persuasion teams."

The present study aims to investigate the proportion of COVID-19 vaccine refusal and its associated factors in adults aged 55 years and older.

MATERIALS AND METHODS

Study Design: Descriptive

A brief organisational framework of healthcare services in Turkey: The primary healthcare units operating to provide healthcare services in Turkey are family medicine units (FMUs). While FMUs provide primary health care to approximately 4,000 people, they have become the fundamental units for the COVID-19 vaccination. The FMUs are affiliated with community health centres (CHCs), CHCs are affiliated with presidencies of public healthcare services (PPHS), PPHS are affiliated with Provincial

Directorates of Health (PDH), and PDH are affiliated with the Ministry of Health (MoH).

Presentation of the Research Area

With a population of 267,092 people, Burdur is a city located in the Mediterranean region of Turkey. The population of the central district where we conducted the research was 111,984. The population of people aged 55 years and over was 26,768 (10). The main livelihood of the province is agriculture and animal husbandry (11). There is a secondary care hospital, an oral and dental health centre, a CHCs and a total of 36 FMU in the central district (12).

Research Design and Sample: According to the Burdur PPHS data, Among 26,768 people aged 55 and over living in the city center, 1,303 (4.9%) were not vaccinated for COVID as of June 2021. These individuals constituted the target population of this descriptive study. A total of 349 (26.8%) people could not be contacted because of refusal to answer phone calls, incorrect contact numbers, and deaths. Following persuasion efforts, 658 participants agreed to be vaccinated while 150 participants absolutely refused to be vaccinated and 146 people hesitated to get vaccinated (Table 1).

Variables: The dependent variables were vaccine acceptance (n=658) or absolute objectors (n=150) following persuasion attempts, while the independent variables were sex, age, education, occupation, place of residence and sources of vaccine information.

Persuasion process and data collection: Vaccination applications continued according to age groups, and on April 16, 2021, the 55 age group was granted the right to be vaccinated. However, vaccination levels did not reach the expected rates. In order to increase the rate of Covid 19 vaccination, the Ministry of Health has issued a declaration on the establishment of "vaccine persuasion teams" within the CHCs. Accordingly, in every CHC, health personnel were assigned to call the people who were not vaccinated, to learn their opinions about the vaccine, to inform them about the vaccine and to persuade them to get vaccinated. The teams were able to access the list of unvaccinated people in their area of responsibility via HSYS. Data such as contact information, age, sex, and chronic disease were accessed via HSYS. It is envisaged that the teams will call people via their contact number, question the reason for not vaccinating, give information about the reason for refusal, and vaccinate those who decide to vaccinate, if necessary, by going to their homes (8,9). In the persuasion studies, information notes prepared for the common causes of vaccine refusal were used. If a participant had any of the responses in Table 2 to the questions asked, they were provided with information regarding their response. In addition, the persuasion teams tried to convince the participants to accept vaccinations by providing information on other vaccine-related subjects they were curious about. In the study, the data of the interviews conducted by the vaccine persuasion teams between 28 June – 1 July 2021 were used. Total of 349 (26.8%) people could not be contacted because of refusal to answer phone calls, incorrect contact numbers, and deaths.

Statistical Analysis: Statistical analyzes were carried out among 150 people who refused to be vaccinated absolutely and 658 people who were persuaded to be vaccinated. We analysed the data using the chi-square test on IBM SPSS Version 23.0 (SPSS; IBM Corp., Armonk, NY, USA). The participants' descriptive characteristics are shown as numbers and percentages. Independent variables found to be statistically significant in the chi-square test were included in the logistic regression analysis. A p value <0.05 was accepted as statistically significant.

Ethical Considerations: Vaccine persuasion teams gave information to the people they called on the phone about the reasons for the call and interviewed those who agreed to be interviewed. In order for the data collected at CHC to be used

scientifically within the scope of vaccine persuasion studies, an application was made to the Health Scientific Research Platform, which is authorized to allow research to be carried out within the scope of Covid 19. Following the response that the data could be used, the ethics committee approval of the study was obtained from the Mehmet Akif Ersoy University Non-Invasive Clinical Research Ethics Committee (GO 2021/10).

RESULTS

The mean age of the participants was 65 ± 9.5 years (55–102 years) About 56.1% of them were males, 80.1% educated 8 years and below, 67.5% living in the city center and 80.7% obtained vaccine information from social media, television and newspapers. Despite participants' right to vaccination, as of the research date, the rate of unvaccinated individuals was 4.9% of the total 55-years or older population. After the interviews, 50.5% agreed to be vaccinated.

Table 2 shows the reasons for vaccine refusal. The most common reason for not receiving the vaccine was "distrust" (28.7%), while 11 (7.3%) participants reported that "they required no vaccination since they were healthy".

Table 1. Distribution of the aged 55 and over people following persuasion efforts (Burdur-Turkey, 2021)

Persuation efforts	N/n	%
Status of COVID vaccination (N=26,768)		
Vaccinated	25.465	95.1
Not vaccinated	1303	4.9
Persuation process involvement status (N=1303)		
Out of contact	349	26.8
Involved	954	73.8
Persuation Status (n=954)		
Persuaded	658	69.0
Hesitated	146	15.3
Absolute objectors	150	15.7

Table 2. Distribution of reasons for refusal of Vaccine among participants (Burdur-Turkey, 2021)

Reasons for Vaccine Refusal	n	%
"The vaccines are newly developed, so I do not trust them."	43	28.7
"I have a chronic disease"	40	26.7
"COVID-19 is overrated."	39	26.0
"I have seen it in the news; I am afraid of its side effects."	17	11.3
"I am healthy, so I do not need vaccination."	11	7.3
Total	**150**	**100.0**

Table 3. Vaccine refusal status of participants by some demographic characteristics and sources of vaccine information (Burdur-Turkey, 2021)

Characteristics		IVaccine refusal status				
		Accepted	Refused	Total	X2	p
		n (%)**	n (%)**	n (%)***		
Age	55-64 years	436 (82.3)	94 (17.7)	530 (65.6)	3.712	0.294
	65-74 years	125 (81.7)	28 (18.3)	153 (18.9)		
	75-84 years	69 (81.2)	16 (18.8)	85 (10.5)		
	85 and + years	28 (70.0)	12 (30.0)	40 (5.0)		
Sex	Male	365 (80.6)	88 (19.4)	453 (56.1)	0.506	0.477
	Female	293 (82.5)	62 (17.5)	355 (43.9)		
Education	8 years and below	541 (83.6)	106 (16.4)	647 (80.1)	**10.217**	**0.001**
	Over 8 years	117 (72.7)	44 (27.3)	161 (19.9)		
Profession**	Retired/Unemployed	478 (81.6)	108 (18.4)	586 (72.5)		
	Private sector	78 (78.8)	21 (11.2)	99 (12.3)	6.654	0.099
	Civil servant	26 (70.3)	11 (29.7)	37 (4.6)		
	Farmer	76 (88.4)	10 (11.6)	86 (10.6)		
Place of residence	City center	432 (79.3)	113 (20.7)	545 (67.5)	**5.213**	**0.022**
	Rural area	226 (85.9)	37 (14.1)	263 (32.5)		
Source of vaccine information	Family physician	141 (90.4)	15 (9.6)	156 (19.3)	**10.241**	**0.001**
	Other*	517 (79.3)	135 (20.7)	652 (80.7)		
Total		**658 (81.4)**	**150 (18.6)**	**808 (100.0)**		

*social media, television, newspaper etc.** row percentage, *** column percentage ****Korkut Boratav's "Class Profiles from Istanbul and Anatolia" is referenced (Boratav, K. (2004). İstanbul ve Anadolu'dan Sınıf Profilleri. 2nd Edition. Ankara: İmge Bookstore p:23-28).

Statistical analyzes were conducted between 150 people who were outspoken and 658 who were persuaded to get vaccinated (808 people in total). The participants did not significantly differ in vaccine refusal by age (p = 0.294), sex (p = 0.477), and occupation (p = 0.099). However, they significantly differed by place of residence (p = 0.022), educational attainment (p = 0.001), and source of vaccine information (p = 0.022). Then, the variables showing statistically significant differences were included in the logistic regression analysis.

It has been determined that vaccination refusal is 1.749 (95% CI= 1.148–2.664) times higher in those with an education level of 8 years and above. Vaccine refusal was also 2.367 (95% CI=1.341–4.178) times more prevalent among participants who obtained vaccine information from other sources (social media, TV, newspapers, etc.) compared to those who obtained vaccine information from their family physicians (Table 4).

Table 4. Results of logistic regression analysis of factors affecting vaccine refusal status (Burdur-Turkey, 2021)

Dependent variable: Vaccine refusal status						
Independent variables		**B**	**SE.**	**Wald**	**Odds Ratio**	**95% CI**
Educational attainment	Over 8 years	.559	0.215	6.774	**1.749**	1.148-2.664
	8 years and below				1 (Reference)	
Source of vaccine information	Other	.861	0.290	8.824	**2.367**	1.341-4.178
	Family physician				1 (Reference)	

DISCUSSION AND CONCLUSION

The highly contagious nature of COVID-19, its heavy burden on healthcare systems, and the lack of a robust treatment that can improve its prognosis make the use of a vaccine inevitable (13). However, ensuring COVID-19 vaccine acceptance prevails over the effective and equitable distribution of vaccines. Although vaccination is considered indispensable by healthcare professionals, it is a known fact that anti-vaccination is an increasing problem worldwide (14).

We found that only 4.9% of the participants remained unvaccinated within our target population (55 years and above) in June 2021. This means that vaccine acceptance among older adults was about 95.0%. The literature reports varying results on vaccine acceptance in populations aged 55 years and over. It was previously found to be 79.0% in low/low-middle income countries, 40.0% in Russia, and 69.4% in the USA (15). A European-based study revealed that vaccine refusal was 5.0% among people aged 55 years and over (16). Another study discovered that vaccine refusal was 14.3% among older adults (17). Overall, while the percentage of unvaccinated older adults in this research region overlaps that of Europe, it is considered better when compared with other studies. Possible reasons for this situation may be that the population was easily accessible because of the city's geographical structure and that the number of healthcare workers per capita in Burdur was above Turkey's average.

Vaccination refusal was found to be statistically significantly higher in those with an education level above 8 years (OR= 1.749). Despite overlapping results in the literature (15,18,19), some studies showed that low educational attainment incited vaccine refusal among people (20-22). Educated parents with a modern worldview believe that immunity should occur naturally; therefore, they do not want to have their children vaccinated, proposing that vaccination means intervening in an immunity mechanism that should occur spontaneously (1). This may apply to educated adults regarding vaccination. It is also possible that people with higher educational attainments are more concerned about the possible side effects and risks of novel vaccines. Furthermore, the nature of the patient–physician relationship may also facilitate vaccine refusal among educated individuals. In classical medicine practices, physicians may prefer to communicate with their patients based on an activity-passivity model where physicians mostly decide on behalf of their patients (23). However, highly educated individuals are dissatisfied with such relationships in which they perceive that their right to be informed is usurped; therefore, they may refuse the practices dictated to them.

The internet and smartphones have enabled more and more people to access social media, which appears to be a good tool for self-education in the vaccine decision-making process. On the other hand, the virtual environment increases the risk of encountering complex or incomplete scientific knowledge, conspiracy theories, and anti-vaccine messages, which may increase vaccine refusal among individuals. Many studies on adult vaccination have suggested that the level of vaccination is higher when recommended by healthcare providers, especially family physicians (23-25). In our study, the proportion of acceptance of the vaccine was 2,367 (95% CI= 1.341–4.178) times higher among the participants who received information about vaccination from their family physicians than those who received information from other sources.

At the time of this research, although the vaccine acceptance level was quite high among our participants compared to international and national data, a substantial number of people remained unvaccinated. Distrust of vaccines and feeling of being subjected to clinical trials were shown to be the greatest reasons for vaccine refusal, as in many studies (16,21). Thus, community-based studies should be planned to overcome such factors and ensure vaccine confidence. Moreover, family physicians should be given feedback on how effectively they provide the population with vaccine information. On the other hand, we found that vaccine refusal was high in the educated group. Therefore, vaccine education should be designed in accordance with individuals' educational attainment. Another issue that needs to be considered is the patient–physician relationship. A patient–physician relationship based on the activity-passivity model with old habits may cause resistance not only to vaccination but also to other medical interventions. It may be helpful to establish a participation-based relationship in which the physician and the patient make decisions together on all applications, from diagnosis to treatment options.

Limitations of the Study

One of the limitations of this study is that it is a descriptive ; therefore, it is limited in explaining the cause-and-effect relationship. In addition, only people who are included in the software of the Ministry of Health and who have a phone number in the system were interviewed. Variables for vaccine rejection are the limited number of variables shown in other vaccine rejection studies. Also 26% of the population could not be reached.

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Conflict of Interest

There is no conflicts of interest or disagreements between the authors.

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