

ORIGINAL ARTICLE

Assessing the Distrust and Vaccine Hesitancy about COVID-19 Vaccines among Academic Staff in Turkey: A Cross-Sectional Study

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ABSTRACT

Objective: To determine the distrust and hesitancy about coronavirus disease (COVID-19) vaccines among academic staff in Turkey.

Methods: This cross-sectional study was conducted at different universities in Turkey from April to June 2021. Turkish-speaking academics working as academic staff in Turkey were included. The outcomes were staff distrust of COVID-19 vaccines and vaccine hesitancy score levels. Scale of Vaccine Hesitancy in Turkish Language-Short Form was used to measure vaccine hesitancy score levels. The scale scored between 12 and 60; the risk of vaccine hesitancy increases as the score increases.

Results: Total 932 academic staff, distrust of COVID-19 vaccines rate was observed in 560 (60.1%). Females were 0.32 times significantly less likely to distrust COVID-19 vaccines (aOR 0.68, 95% CI 0.51 to 0.92, p-value 0.014). Those with a history of influenza vaccination were 0.75 times significantly less likely to distrust COVID-19 vaccines (aOR 0.25, 95% CI 0.17 to 0.36, p-value <0.001). However, staff informed through social media were 1.51 times significantly more likely to distrust COVID-19 vaccines (aOR 1.51, 95% CI 1.09 to 2.10, p-value 0.012). Mean vaccine hesitancy score was 52.68 ±8.72. A significantly higher mean vaccine hesitancy score was found with age 51-60 years, working in health sciences, staff had no history of seasonal influenza vaccine, received information about COVID-19 vaccines from social media and social circles (p-value <0.05 respectively).

Conclusion: The study found notable distrust and hesitancy toward COVID-19 vaccines, influenced by demographics. Those with influenza vaccination history showed lower hesitancy, while social media played a crucial role.

Keywords: Coronavirus, COVID-19 Vaccines, Vaccination, Vaccine Hesitancy, Turkey.

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INTRODUCTION

The coronavirus disease (COVID-19) pandemic caused more than 77 million deaths worldwide at the end of 2020.¹ The quick and easy transmission of the virus and the absence of a preventive vaccine have been cited as the main reasons for high mortality rates.² The first COVID-19 vaccination started on 8 December 2020 in the UK and on 13 January 2021 in Turkey. Initially, it was stated that the general public was willing to be vaccinated due to the limited number of COVID-19 vaccines.³ In the following process, the COVID-19 vaccine caused concerns among citizens of many countries about the safety, efficacy, and side effects of the vaccine.⁴ Likewise, the novelty of the disease, the politicisation of the vaccine, and the distrust of experts and governments have increased uncertainty about the COVID-19 vaccine.⁵ Accordingly, vaccine hesitation

began in people, which has become a new obstacle in the COVID-19 pandemic.

Vaccine hesitancy is described as reluctance, delay in acceptance or refusal to be vaccinated despite the vaccine's availability.⁶ The concept of vaccine hesitancy was recognized by the World Health Organization (WHO) as "one of the top ten threats to global health".⁷ Even this hesitancy was reported among educated people as well. Studies conducted with medical or nursing students have revealed that COVID-19 vaccine hesitancy rates were between 6% and 65.04%.^{8,9} The determinants of vaccine hesitancy are numerous and complex and vary over time, across countries, and even within communities inside a single country.¹⁰

In this context, academic staff producing scientific knowledge play an important role in distrust in vaccines, and their recommendations significantly affect vaccine distrust and hesitancy in society. In the

current research, we aimed to evaluate distrust and vaccine hesitancy about COVID-19 vaccines among academic staff in Turkey.

METHODS

This cross-sectional study was conducted with academic staff working at different universities in Turkey using an online form distributed via e-mail between April 2021 and June 2021. Ethical approval was acquired from the Scientific Research and Publication Ethics Committee of Osmaniye Korkut Ata University (decision no: 2021/2/5, dated: 09.04.2021). All procedures were carried out with the ethical guidelines (institutional and national) of the Supervisory Council on human experimentation, and no volunteers were mistreated or abused, both physically and psychologically, during the research. Written informed consent was obtained from all participants before data collection.

According to the data of the Higher Education Council of Turkey, there were 207 higher education institutions in Turkey, of which 129 are public, 74 are foundation, and 4 are foundation vocational schools. A total of 270,403 academic staff, including 90,338 faculty members and 180,65 lecturers, work in these institutions. The minimum sample size of the study was calculated as 381, based on a 45.3% prevalence rate¹¹, 5% absolute precision, and 95% confidence interval using the OpenEpi version 3.0 program. However, we included 932 academic staff in this study who agreed to participate in the research and completed the questionnaire within the research period.

All those participants working as an academic staff in any higher education institution in Turkey and knowing Turkish language were included in the study. Those staff not answering the online survey questions within three months from the date of the e-mail were sent a reminder, and incomplete answers were excluded. The "access link" of the survey form was sent to the academic staff with an official letter from the universities.

The research data were collected using the personal information form prepared by the researchers based on the literature,^{9,11,12} the information form on COVID-19 vaccines and the Turkish Vaccine Ambivalence Scale-Short Form. The study's outcomes were the academic staffs' status on distrust of COVID-19 vaccines (yes or no) and vaccine hesitancy score levels. Information regarding gender, marital status, age, academic title, field of expertise, a history of seasonal influenza vaccine, and sources of knowledge about the COVID-19 vaccine were also noted.

The personal information form consists of 12 questions about the demographic characteristics of academic staff and their COVID-19 vaccine distrust. The form included five questions about demographic characteristics and seven questions about the participant's status of COVID-19 vaccine distrust, sources of knowledge about the COVID-19 vaccine, and influenza vaccination status. Academics were asked the question, "Do you trust the COVID-19 vaccine?". The answers given were determined as "Distrust of COVID-19 Vaccines" (Yes or No).

The Scale of Vaccine Hesitancy in Turkish Language-Short Form was used to measure vaccine hesitancy score levels. It was developed by Kilicarslan et al. to determine vaccine hesitancy levels.¹³ The participants' responses to the items in the measurement tool were obtained with a 5-point Likert scale. The short form of the scale consists of 12 questions, and a minimum score of 12, and a maximum score of 60 can be obtained. There is no cut-off point in the scale; the higher the score, the higher the level of vaccine hesitancy. The Cronbach alpha value of the scale was found to be 0.83. Data entry and analysis were done using a Statistical Package for Social Sciences (SPSS) version 20.0. Mean \pm SD was computed for quantitative variables such as vaccine hesitancy score, while frequency and percentages were computed for categorical variables such as gender, marital status, age, academic title, field of expertise, history of seasonal influenza vaccine, and sources of knowledge about COVID-19 vaccine. Inferential statistics were explored using the Chi-square test to compare distrust of COVID-19 vaccines with general characteristics of academic staff. Independent t-test and One-Way ANOVA test were applied to compare vaccine hesitancy score with general characteristics of academic staff. The p-value of ≤ 0.05 was considered statistically significant. Moreover, binary logistic regression was applied to all those variables found significant in the Chi-square contingency table. Both univariable and multivariable logistic regression were applied.

RESULTS

Of the total 932 academic staff, the majority of academic staff were females 552 (59.2), married 645 (69.2%), between 51 and 60 years of age 416 (44.6), and Associate Professors 285 (30.6). Among the academic staff, 434 (46.5 %) belonged to the health sciences, 684 (73.4%) had a history of seasonal influenza vaccine, and most of them got knowledge about the COVID-19 vaccine from scientific articles, i.e., 860 (92.2%).

The distrust of COVID-19 vaccines rate was 560 (60.1%). A significant association of distrust of COVID-19 vaccines was found with gender (p-value <0.001), marital status (p-value 0.036), age (p-value <0.001), academic title (p-value 0.027), history of seasonal influenza vaccine (p-value <0.001), sources of

knowledge about COVID-19 vaccine- social media (p-value <0.001), and sources of knowledge about COVID-19 vaccine-social circle (p-value 0.009) (Table 1).

Table 2 reveals binary logistic regression analysis for variables predicting COVID-19 vaccine distrust of academic staff. At the univariate level, all of the

Table 1: Association between COVID-19 vaccine distrust and general characteristics of academic staff (n = 932)

Item	Total	Distrust of COVID-19 Vaccines		p-value
		Yes (n = 560)	No (n = 372)	
Gender				
Female	552	303 (54.9)	249 (45.1)	<0.001*
Male	380	257 (67.6)	123 (32.4)	
Marital Status				
Single	287	158 (55.1)	129 (44.9)	0.036*
Married	645	402 (62.3)	243 (37.7)	
Age (years)				
≥61	156	82 (52.6)	74 (47.4)	<0.001*
51-60	416	232 (55.8)	184 (44.2)	
41-50	220	142 (64.5)	78 (35.5)	
31-40	115	84 (73.0)	31 (27.0)	
≤30	25	20 (80.0)	5 (20.0)	
Academic Title				
Professor	223	130 (58.3)	93 (41.7)	0.027*
Associate Professor	285	158 (55.4)	127 (44.6)	
Assistant Professor	229	142 (62.0)	87 (38.0)	
Lecturer	96	57 (59.4)	39 (40.6)	
Research Assistant	99	73 (73.7)	26 (26.3)	
Field of Expertise				
Physical Sciences	234	146 (62.4)	88 (37.6)	0.419
Social Sciences	264	163 (61.7)	101 (38.3)	
Health Sciences	434	251 (57.8)	183 (42.2)	
History of Seasonal Influenza Vaccine				
Yes	684	358 (52.3)	326 (47.7)	< 0.001*
No	248	202 (81.5)	46 (18.5)	
Sources of Knowledge about COVID-19 Vaccine				
Social Media				
Yes	558	308 (55.2)	250 (44.8)	<0.001*
No	374	252 (67.4)	122 (32.6)	
Social Circle				
Yes	662	380 (57.4)	282 (42.6)	0.009*
No	270	180 (66.7)	90 (33.3)	
Scientific Articles				
Yes	860	520 (60.5)	340 (39.5)	0.414
No	72	40 (55.6)	32 (44.4)	

* p-value ≤ 0.05 (Chi-Square test)

variables presented in table 2 showed significant odds ratios. Furthermore, the findings of the multivariable analysis showed that after adjusting the variable mentioned in table 2, females 0.32 times significantly less likely to have distrust of COVID-19 vaccines as compared to males (aOR 0.68, 95% CI 0.51 to 0.92, p-value 0.014). Similarly, staff who had a history of seasonal influenza vaccine were 0.75 times significantly less likely to have distrust of COVID-19 vaccines as compared to their counterpart (aOR 0.25, 95% CI 0.17 to 0.36, p-value <0.001). The academic staff who reported getting information about COVID-19 vaccinations from

social media were 1.51 times significantly more likely to have distrust of COVID-19 vaccines as compared to staff who did not get information from social media (aOR 1.51, 95% CI 1.09 to 2.10, p-value 0.012). The overall mean vaccine hesitancy score was 52.68 ± 8.72. A significantly higher mean vaccine hesitancy score was found among staff aged 51 and 60 years (p-value 0.004), working in the field of health sciences (p-value <0.001), academic staff had no history of seasonal influenza vaccine (p-value <0.001), receiving information about COVID-19 vaccines from social media (p-value <0.001), and social circle (p-value <0.001). Table-3

Table 2: Binary logistic regression analysis for variables predicting COVID-19 vaccine distrust of academic staff (n = 932)

	Univariable analysis		Multivariable analysis	
	COR (95% CI)	p-value	aOR (95% CI)	p-value
Gender				
Female	0.58 (0.44 to 0.76)	<0.001*	0.68 (0.51 to 0.92)	0.014*
Male	1		1	
Marital Status				
Single	1.35 (1.01 to 1.79)	0.037*	1.09 (0.79 to 1.50)	0.598
Married	1		1	
Age, years				
≥61	3.61 (1.29 to 10.10)	0.014*	3.16 (0.97 to 10.30)	0.055
51-60	3.17 (1.16 to 8.61)	0.023*	2.83 (0.92 to 8.67)	0.069
41-50	2.19 (0.79 to 6.08)	0.130	1.93 (0.63 to 5.85)	0.244
31-40	1.47 (0.51 to 4.27)	0.473	1.29 (0.42 to 3.98)	0.650
≤30	1		1	
Academic Title				
Professor	2.00 (1.19 to 3.38)	0.009*	0.74 (0.36 to 1.49)	0.404
Associate Professor	2.25 (1.36 to 3.73)	0.002*	1.03 (0.55 to 1.92)	0.927
Assistant Professor	1.72 (1.02 to 2.88)	0.041*	0.87 (0.46 to 1.64)	0.687
Lecturer	1.92 (1.04 to 3.51)	0.034*	1.24 (0.62 to 2.48)	0.529
Research Assistant	1		1	
History of Seasonal Influenza Vaccine				
Yes	0.25 (0.17 to 0.35)	<0.001*	0.25 (0.17 to 0.36)	<0.001*
No	1		1	
Sources of Knowledge about COVID-19 Vaccine- Social Media				
Yes	1.67 (1.27 to 2.20)	<0.001*	1.51 (1.09 to 2.10)	0.012*
No	1		1	
Sources of Knowledge about COVID-19 Vaccine- Social Circle				
Yes	1.48 (1.10 to 1.99)	0.009*	1.11 (0.78 to 1.58)	0.559
No	1		1	

COR: Crude odds ratio, aOR: Adjusted odds ratio, CI: confidence interval, *p-value ≤ 0.05

Table 3: Mean comparison of vaccine hesitancy score with general characteristics of academic staff (n = 932)

Item	Vaccine Hesitancy Score		p-value
	Mean± SD	95% C.I	
Sex			
Male	52.48 ± 9.28	51.55 -- 53.42	0.570 [^]
Female	52.81 ± 8.32	52.12 -- 53.51	
Marital Status			
Single	52.36 ± 8.92	51.32 -- 53.40	0.460 [^]
Married	52.82 ± 8.63	52.15 -- 53.49	
Age			
≥61	52.97 ± 8.89	51.56 -- 54.38	0.004 ^{*~}
51-60	53.67 ± 9.39	52.76 -- 54.57	
41-50	51.95 ± 7.90	50.90 -- 53.01	
31-40	50.46 ± 7.02	49.17 -- 51.76	
≤30	50.92 ± 7.86	47.67 -- 54.16	
Academic Tittle			
Professor	52.55 ± 9.02	51.36 -- 53.74	0.068 [~]
Associate Professor	53.44 ± 9.08	52.38 -- 54.50	
Assistant Professor	52.39 ± 8.61	51.27 -- 53.51	
Lecturer	53.50 ± 8.55	51.76 -- 55.23	
Research Assistant	50.64 ± 7.01	49.24 -- 52.04	
Field of Expertise			
Physical Sciences	52.64 ± 8.61	51.53 -- 53.75	<0.001 ^{*~}
Social Sciences	50.76 ± 8.54	49.72 -- 51.80	
Health Sciences	53.86 ± 8.70	53.04 -- 54.68	
History of Seasonal Influenza Vaccine			
Yes	49.00 ± 7.72	48.03 -- 49.97	<0.001 ^{**^}
No	54.01 ± 8.68	53.36 -- 54.66	
Sources of Knowledge about COVID-19 Vaccine-Social Media			
Yes	53.93 ± 8.36	53.24 -- 54.63	<0.001 ^{**^}
No	50.80 ± 8.92	49.89 -- 51.71	
Sources of Knowledge about COVID-19 Vaccine-Social Circle			
Yes	53.60 ± 8.50	52.95 -- 54.25	<0.001 ^{**^}
No	50.42 ± 8.86	49.36 -- 51.49	
Sources of Knowledge about COVID-19 Vaccine-Scientific Articles			
Yes	52.66 ± 8.64	52.08 -- 53.24	0.813 [^]
No	52.91 ± 9.67	50.64 -- 55.19	

*p-value ≤ 0.05 - (^Independent t-test and ~One way ANOVA test applied)

DISCUSSION

In the present research, we aimed to assess distrust and vaccine hesitancy about COVID-19 vaccines among academic staff in Turkey. Decision-making on vaccination is associated with societies' perceptions of the benefits or risks of vaccines and, in connection with this, their confidence in vaccination.¹⁴ It was determined that more than half of the academic staff participating in this study did not trust COVID-19 vaccines. Academicians play an important role in the issue of trust in vaccines in society, owing to their recommendations on trust in vaccines.¹⁵ Considering that people recommend the interventions they trust to society, this finding in our study is important in terms of demonstrating that a significant number of the academicians who have a significant effect on society trust the COVID-19 vaccine.

In our study, there was a significant association between age, sex, a history of influenza vaccine, receiving knowledge about vaccines from social media, and the distrust of COVID-19 vaccine. In the study, the academic staff of younger age experienced a lack of vaccine trust than the older academic staff. Considering that a significant part of the participants received knowledge about the COVID-19 vaccine from social media, this may be associated with more use of social media by the younger group. A study conducted in Turkey during the COVID-19 pandemic showed that the rate of social media use was higher in the younger population.¹⁶ Another finding in our study supports this assumption that the academic staff who received knowledge about the COVID-19 vaccine from social media were more likely to distrust the COVID-19 vaccine. Due to the precautions and restrictions during the COVID-19 pandemic, people increased their need for socialization and their use of social media to obtain knowledge about COVID-19. A study including 764 people in Turkey revealed that three-fourth of the participants received knowledge about COVID-19 from social media.¹⁶ Based on these findings, it can be said that social media is an important source of information sharing, especially among the young population, and it is important for health institutions such as the WHO and ministries of health to use social media in their vaccination information activities.

Another finding of our study was that male academic staff trusted the COVID-19 vaccine more than female academic staff. Likewise, two studies conducted showed that males were more determined to get the COVID-19 vaccine than females.¹⁷ Furthermore, Callaghan et al. found in their US-based study that

thirty-one percent of the participants did not tend to get the COVID-19 vaccine and were predominantly females.¹⁸ This finding may have originated from the higher prevalence of cardiovascular and chronic respiratory diseases in males and the higher mortality and complications in the male gender in COVID-19. These may affect the trust and acceptance of the vaccine among males.¹⁹

This study found that those with a history of influenza vaccine were more confident in the COVID-19 vaccine. Likewise, Dror et al. determined in their study conducted in Israel that people who had been vaccinated against influenza were more likely to accept the COVID-19 vaccine in the future.¹⁷ This may be associated with the role of previous vaccination experience in increasing confidence in the COVID-19 vaccine.

The four factors related to the COVID-19 vaccine hesitancy of the academic staff included in our study were the mean age of the academic staff, the history of influenza vaccine, receiving knowledge about the COVID-19 vaccine from their social circle and social media, and their status of the COVID-19 vaccine distrust. In this study, younger academic staff had higher anti-vaccination levels than older ones. This finding is parallel with research results in the literature.²⁰ This can be explained by the higher mortality rate of COVID-19 infection in the elderly population than in the younger population.

In our study, the vaccine hesitancy levels of the academic staff without a history of influenza vaccine were higher. This may be associated with the role of previous vaccination experience in increasing the acceptance of the COVID-19 vaccine.²¹

In this study, vaccine hesitancy was higher in academic staff working in health sciences. Other studies reported that vaccine hesitation rates in healthcare workers were higher than in the general public.^{22,23} In our country and many other parts of the world, healthcare professionals and academic staff in the health sciences are frequently and publicly portrayed as the primary recipients of vaccines. This suggests that many in the health field may be reluctant to serve as "guinea pigs" for vaccines with limited public messaging.²² It is essential that healthcare professionals, who have important roles in informing the public about vaccines, have high levels of anti-vaccination. More studies examining this issue are needed. Social media is like a sharp double-edged sword that can harm health through inappropriate use and misinformation and helps to share information concerning public health.²⁴ It is known that negative and false information spreads

faster than accurate information in social networks.²⁵ In the past decade, anti-vaccination has accelerated worldwide, and social media plays an important role in this negative situation.²⁶ During the Ebola epidemic in 2014, conspiracy theories and other false information spread rapidly on social media.²⁷ A study conducted with social media users in the USA during this pandemic revealed that sharing false information or rumors increased vaccine hesitancy levels.²⁵ Likewise, in our study, the COVID-19 vaccine hesitancy levels were higher among academic staff who received knowledge about the COVID-19 vaccine from social media. Based on these findings, it can be said that social media adversely affects many parts of society in terms of vaccine hesitancy. Therefore, health institutions must share accurate and sufficient information on social media platforms to create a more proactive public health presence.

Another important finding in our study was that academic staff who received information about the vaccine from their social circle had high hesitancy about the COVID-19 vaccine. Similarly, in a study on flu vaccines, it was reported that the beliefs and behaviors of peers influenced people's decisions to be vaccinated.²⁸ In another study on COVID-19 vaccines, it is observed that information received from the social environment and vaccine hesitancy are related.²⁹ These findings show that the social environment is an important source of information about vaccine hesitancy. Misinformation about the COVID-19 vaccine and perceived side effects in communication with the social environment during the pandemic may have increased vaccine hesitancy.

There are some limitations in this study. First of all, research data were collected using an online survey method. This may have led to potential selection bias since the participants did not see the survey or there was no or poor internet access during the data collection process. These limitations may also be the reason for the low response rate to the study. Secondly, as a cross-sectional survey, the study assesses COVID-19 vaccine hesitancy only at a given time, followed by a follow-up observation.

CONCLUSION

In conclusion, the study revealed substantial distrust and vaccine hesitancy towards COVID-19 vaccines. Demographic factors such as gender, marital status, age, and academic title were significantly associated with vaccine distrust. Notably, females exhibited a higher rate of distrust, while those with a history of

seasonal influenza vaccination demonstrated reduced vaccine hesitancy. Moreover, social media emerged as a notable source linked to increased distrust.

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