

Can History of COVID-19 Be Definitive on Coronaphobia and Vaccine Attitudes?

COVID-19 Öyküsü Koronafobi ve Aşı Tutumlarında Belirleyici Olabilir Mi?

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ABSTRACT

Introduction: To stop the transmission and rapid spread of COVID-19, 60-75% of the population must have immunity. The most appropriate way to ensure this immunity seems to be the widespread use of vaccines. In this study, it was aimed to evaluate the anxiety and control perceptions related to the pandemic in individuals with and without COVID-19 disease. In addition, the relationship between having the disease and vaccine hesitancy was examined.

Materials and Methods: Four hundred and thirty-seven participants were included in this study. Participants were evaluated over three groups (Group 1: People who had not contracted COVID-19 before; Group 2: People who had COVID-19 with home treatment without hospitalization; Group 3: People who had contracted COVID-19 and were treated in the hospital). The Perception of Control of COVID-19 Scale (PCo-COVID-19), Attitudes Towards COVID-19 Vaccine Scale, COVID-19 Phobia Scale (CP19-S) were filled in by the participants.

Results: This study included 290 COVID-19 patients (148 outpatients and 142 inpatients) and 147 participants without COVID-19 disease. Participants with COVID-19 disease had lower PCo-COVID-19 micro control and controllability scores than those without. This finding was interpreted as the individual measures taken to avoid getting the disease seem less sufficient and the controllability of the disease is thought to be lower in those who have had the disease. In addition, positive correlations were found between vaccination attitudes and perception of control subscales (PCo-COVID-19- Macro-control, PCo-COVID-19- Micro-control and PCo-COVID-19- Controllability). Vaccination attitudes were found to be more positive in those with high control perception scale scores. Similar results were obtained in terms of coronaphobia in participants who did not have the disease and those who had the disease at home. However, significantly higher coronaphobia scores (CP19-S) were obtained in inpatients compared to the other two groups.

Conclusion: Community immunity is important to stop the transmission and rapid spread of COVID-19, which is possible with vaccination. Vaccine hesitancy may hinder successful control of the COVID-19 pandemic. This situation should be considered when preparing health policies.

Key Words: COVID-19; Coronaphobia; Vaccine Attitudes; Vaccine Hesitancy

ÖZ

COVID-19 Öyküsü Koronafobi ve Aşı Tutumlarında Belirleyici Olabilir Mi?

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Giriş: COVID-19'un bulaşmasını ve hızlı yayılmasını durdurmak için nüfusun %60-75'inin bağışıklığa sahip olması gerekir. Bu bağışıklığı sağlamanın en uygun yolu aşılama oranının artırılması gibi görünmektedir. Bu çalışmada COVID-19 geçiren veya geçirmeyen bireylerde pandemiyle ilgili kaygı ve kontrol algılarının değerlendirilmesi amaçlanmıştır. Ayrıca hastalığı geçirme durumu ile aşı tereddütü arasındaki ilişki incelenmiştir.

Materyal ve Metod: Bu çalışmaya dört yüz otuz yedi katılımcı dahil edildi. Katılımcılar üç grup üzerinden değerlendirildi (Grup 1: Daha önce COVID-19 geçirmemiş kişiler; Grup 2: COVID-19'u hastaneye yatırılmadan evde tedavi edilerek geçiren kişiler; Grup 3: COVID-19'u hastanede tedavi edilerek geçiren kişiler). COVID-19 Kontrol Algısı Ölçeği (PCo-COVID-19), COVID-19 Aşısına Yönelik Tutum Ölçeği, COVID-19 Fobi Ölçeği (CP19-S) katılımcılar tarafından doldurulmuştur.

Bulgular: Bu çalışmaya 290 COVID-19 hastası (148 ayakta ve 142 yatan hasta) ve COVID-19 geçirmeyen 147 katılımcı dahil edildi. COVID-19 geçiren katılımcılar, geçirmeyenlere göre daha düşük PCo-COVID-19 mikro kontrol ve kontrol edilebilirlik puanlarına sahipti. Bu bulgu, hastalığı geçirenlerde hastalığa yakalanmamak için alınan kişisel tedbirlerin daha az yeterli görüldüğü ve hastalığın kontrol edilebilirliğinin daha düşük düşünüldüğü şeklinde yorumlandı. Ayrıca aşılama tutumları ile kontrol algısı alt ölçekleri (PCo-COVID-19-Makro-kontrol, PCo-COVID-19- Mikro-kontrol ve PCo-COVID-19-Kontrol edilebilirlik) arasında da pozitif ilişkiler bulunmuştur. Kontrol algı ölçeği skorları yüksek olanlarda aşılama tutumlarının daha olumlu olduğu saptandı. Hastalığı olmayan katılımcılar ve hastalığı evinde geçirenlerde koronafobi açısından benzer sonuçlar elde edilmiştir. Ancak yatarak tedavi alanlarda diğer iki gruba göre anlamlı olarak daha yüksek koronafobi skorları (CP19-S) elde edilmiştir.

Sonuç: Aşılamayla mümkün olan COVID-19'un bulaşmasını ve hızlı yayılmasını durdurmak için toplum bağışıklığı önemlidir. Aşı tereddütü, COVID-19 pandemisinin başarılı kontrolünü engelleyebilir. Sağlık politikaları hazırlanırken bu durum dikkate alınmalıdır.

Anahtar Kelimeler: COVID-19; Koronafobi; Aşı Tutumları; Aşı reddi

INTRODUCTION

The novel coronavirus disease-2019 (COVID-19) emerged in Wuhan, China, in late 2019, creating a dangerous situation worldwide^[1]. Global efforts to reduce the effects of the pandemic and decrease its health and socioeconomic burden are mainly based on preventive regulation^[2,3]. Although these interventions are vital, they can have negative psychological consequences and be socially and economically destructive^[4]. Given that a phobia is defined as a disproportionate fear response to an object or situation that provokes anxiety or fear, researchers use the term coronaphobia to express extreme fear caused due to COVID-19, arguing that this phobia has a tremendous impact on human psychology^[5-7]. Current research reports that many people are experiencing negative psychological states, such as depression, loneliness, distress, fear, lack of concentration, sleep problems, worries about the future, anger

and fear of stigma, and suffering from post-traumatic stress disorder and generalized anxiety disorder due to the COVID-19 pandemic^[8-11].

Some individuals may also become emotionally detached from the fatigue and passivity associated with the negative, uncontrollable nature and prolonged uncertainty of this crisis. Therefore, people want to reduce uncertainty and regain control of the current situation. One way to reduce uncertainty is to somehow reverse the course of the pandemic, but this is not possible under the current circumstances. For this reason, efforts by health systems and governments to contain the pandemic are important. Another point to note in this context is people's behaviors to protect themselves from the pandemic.

Despite numerous efforts to obtain a successful COVID-19 vaccine, "vaccine hesitancy" is seen as a major obstacle to attempts to control

the pandemic^[12]. Vaccine hesitancy is defined as a deliberate delay in getting the vaccine through reluctance or refusal despite the availability of vaccination services^[13,14]. Social media, socio-economic status, public health measures, policy, geographical barriers, content of the vaccine, and religious, cultural, and societal reasons may cause vaccine hesitancy^[13]. Discussions about vaccine applications have recently come to the fore all over the world. In addition to the current anti-vaccine attitudes, concerns about the safety and efficacy of the vaccine have emerged due to the new emergence of the virus and the rapid production of the vaccine^[15]. We think that the determinants of vaccine hesitancy should be revealed since it is an obstacle in controlling the current pandemic.

In this study, we aimed to evaluate the anxiety and control perceptions related to the pandemic in individuals with and without COVID-19 disease. In addition, we wanted to examine the relation between the state of having the disease and vaccine hesitancy.

MATERIALS and METHODS

Setting

This cross-sectional study was conducted between June and August 2021, and volunteers were included in the study (Group 1: People who had not contracted COVID-19 before; Group 2: People who had COVID-19 with home treatment without hospitalization; Group 3: People who had contracted the COVID-19 and were treated in the hospital).

Participants

Four hundred and fifty participants were included in this study. Patients aged over 18 years, who had clinical signs and symptoms of COVID-19 and were literate enough to fill in the scales, were diagnosed with polymerase chain reaction (PCR) or computed tomography were included into the study. Those under the age of 18 and diagnosed with a psychotic disorder, bipolar disorder, and organic mental disorder were not included in the study. Data from 13 participants were not included in the analysis due to random marking. Hence, only 437 participants were analyzed.

The participants were informed about the study, and their written consent was obtained. The study was conducted following the principles of the Declaration of Helsinki. In addition, approval was obtained from the national and local Ethics Committees for the study (Approval number: E2-21-579; Approval date: 16/06/2021).

Protocol

The participants were evaluated in three groups (Group 1: People who had not contracted the virus before; Group 2: People who had contracted the virus and were treated at home; Group 3: People who had contracted the virus and were treated in the hospital). Age, sex, occupation, year of education, and any additional ailments of the patients were recorded with the prepared socio-demographic data form. In addition, the participants were asked to fill in the Perception of Control of COVID-19 Scale, the Attitudes Towards COVID-19 Vaccine Scale, and the COVID-19 Phobia Scale. Participants' preliminary ideas about vaccine administration were also questioned.

The Perception of Control of COVID-19 (PCo-COVID-19) Scale has been developed by Geniş et al^[16]. It consists of three sub-dimensions-macro-control, personal (micro) control, and controllability. Macro control is related to beliefs about the effectiveness of measures taken at the institutional, national, or global level; personal control is related to the effectiveness of the personal measures taken to avoid contracting the virus; and controllability evaluates the perceptions about regulating the spread of the virus. This scale consists of 12 questions and is evaluated over 5 points (1= strongly disagree, 5= strongly agree).

The Attitudes Towards the COVID-19 Vaccine (ATV-COVID-19) Scale has been developed by Geniş et al^[16]. It evaluates positive and negative attitudes toward the COVID-19 vaccine. It consists of nine questions and is evaluated over 5 points (1= strongly disagree, 5= strongly agree).

The COVID-19 phobia scale (CP19-S) is a 5-point Likert-type self-assessment scale developed to measure the phobia that may develop against COVID-19. The items on the scale are

evaluated between 1 (strongly disagree) and 5 (strongly agree). The total score of the scale ranges from 20 to 100 points. Higher scores indicate higher coronaphobia^[7].

Statistical Analysis

The SPSS 15.0 package program was used in analyzing the data, and $p < 0.05$ value was considered significant for all analyses. Parametric analysis was conducted because the data met the criteria for normal distribution. One-way ANOVA tests were used to analyze continuous variables, and Pearson's Chi-square tests and post-hoc Bonferroni analysis were used to analyze categorical variables. The correlation of inter-scale values was analyzed using Pearson correlation. The predictive factors of vaccination attitudes were evaluated with simple linear regression analyses.

RESULTS

The study included 290 COVID-19 patients (148 outpatients and 142 inpatients) and 147 participants without COVID-19. In the hospitalized group, higher age ($p < 0.001$), males as the dominant sex ($p < 0.001$), lower education level

($p = 0.000$), more family history of COVID-19 ($p < 0.001$), and more presence of additional ailments ($p < 0.001$) were detected.

The results of the participants' vaccination attitudes are given in Table 2: 84.4% of the participants did not contract the virus and 84.5% of the outpatients and 78.9% of the inpatients stated that they were/will be vaccinated. The rate of vaccine rejection was 6.1% in patients who did not contract the virus, 7.4% in the outpatients, and 4.9% in the hospitalized patients.

The participants were questioned about the reasons for their negative vaccination attitudes. Eighty-one participants did not know the effectiveness of the vaccine, 13 participants thought that the vaccine was of foreign origin, 12 participants were afraid of possible side effects, 25 participants were not worried or afraid of COVID-19, 10 participants thought that they would not contract the virus again because they had COVID-19, 11 participants did not believe in the effectiveness of vaccines in general, 20 participants did not trust the composition of the

Table 1. Evaluation of the participants' socio-demographic data

		Group 1 (n= 147)	Group 2 (n= 148)	Group 3 (n= 142)	p
Age (mean \pm SD)		42.5 (\pm 12.6) ^a	40.0 (\pm 12.3) ^a	48.0 (\pm 16.7) ^b	.000 ^{1*}
Sex n (%)	Female	95 (66.9%) ^a	101 (69.2%) ^a	68 (48.2%) ^b	.000 ^{2*}
	Male	47 (33.1%) ^a	45 (30.8%) ^a	73 (51.8%) ^b	
Education year	5 years	17 (12.0%) ^a	17 (11.7%) ^a	50 (35.5%) ^b	.000 ^{2*}
	8 years	3 (2.1%) ^a	7 (4.8%) ^{a,b}	16 (11.3%) ^b	
	12 years	60 (42.3%) ^a	27 (18.6%) ^b	33 (23.4%) ^b	
	\geq 16 years	62 (43.7%) ^a	94 (64.8%) ^b	42 (29.8%) ^c	
Number of people living in the house (mean \pm SD)		3.6 (\pm 1.2) ^a	3.7 (\pm 1.1) ^a	4.1 (\pm 1.8) ^b	.004 ^{1*}
Presence of a family history of COVID-19	Yes	30 (20.4%) ^a	74 (50.0%) ^b	93 (65.5%) ^c	.000 ^{2*}
	No	117 (79.6%) ^a	74 (50.0%) ^b	49 (34.5%) ^c	
Family history of death due to COVID-19	Yes	13 (8.8%) ^a	9 (6.1%) ^a	17 (12.0%) ^a	.213 ²
	No	134 (91.2%) ^a	139 (93.9%) ^a	125 (88.0%) ^a	
Additional diseases	Yes	23 (15.6%) ^a	26 (17.6%) ^a	55 (38.7%) ^b	.000 ^{2*}
	No	124 (84.4%) ^a	122 (82.4%) ^a	87 (61.3%) ^b	
Presence of chronic disease in family members living in the same house	Yes	32 (21.8%) ^a	43 (29.1%) ^a	68 (47.9%) ^b	.000 ^{2*}
	No	115 (78.2%) ^a	105 (70.9%) ^a	74 (52.1%) ^b	

Each subscript letter denotes a subset of group categories whose column proportions do not differ significantly from each other at the .05 level. P¹: One-way ANOVA, P²: Chi-square test, Group 1: people who had not contracted the virus before; Group 2: people who had contracted the virus and were treated at home; Group 3: people who had contracted the virus and were treated in the hospital.

Table 2. Comparison of vaccination attitudes according to groups

What are your thoughts on the COVID-19 vaccine?	Group 1, n (%)	Group 2, n (%)	Group 3, n (%)	p
I trust its effectiveness and have been/will be vaccinated.	83 (56.5%) ^a	78 (52.7%) ^a	91 (64.1%) ^a	.022 ¹
I am not sure of its effectiveness, I have been/will be vaccinated.	41 (27.9%) ^a	47 (31.8%) ^a	21 (14.8%) ^b	
I am undecided.	14 (9.5%) ^a	12 (8.1%) ^a	23 (16.2%) ^a	
I am not sure of its effectiveness. I will not be vaccinated.	3 (2.0%) ^a	3 (2.0%) ^a	4 (2.8%) ^a	
I think it will be ineffective or have side effects. I will not be vaccinated.	6 (4.1%) ^a	8 (5.4%) ^a	3 (2.1%) ^a	

Group 1: People who had not contracted the virus before; Group 2: People who had contracted the virus and were treated at home; Group 3: People who had contracted the virus and were treated in the hospital, ¹Pearson's Chi-square test; *p< 0.05; Each subscript letter denotes a subset of group categories whose column proportions do not differ significantly from each other at the .05 level.

vaccine, and 18 participants did not want to be vaccinated for religious reasons.

A comparison of scaled scores between groups is given in Table 3. Significant differences were found in the PCo-COVID-19 micro-control and PCo-COVID-19 controllability scales between the participants who did not contract the virus and the outpatients. There was a significant difference in terms of CP19-S between the people who did not contract the virus and the patients who were hospitalized. In addition, a significant

difference was found in CP19-S scores between the outpatients and inpatients.

An evaluation of the relationship between the scales showed that vaccine attitudes were positively correlated with PCo-COVID-19 macro-control (r= 0.199), PCo-COVID-19 micro-control (r= 0.155), and PCo-COVID-19 controllability (r= 0.161). In addition, a negative correlation was found between CP19-S and PCo-COVID-19 controllability (r= -0.102) (Table 4).

Table 3. One-way ANOVA analysis for comparison of scaled scores by groups

		Group 1 Mean (± SD)	Group 2 Mean (± SD)	Group 3 Mean (± SD)	F	p ¹	p ²	p ³
PCo-COVID-19	Macro-control	2.95 (± .99)	2.81 (± .89)	3.01 (± .93)	1.616	.443	.851	.188
	Micro-control	3.22 (± .88)	2.85 (± .85)	3.05 (± .94)	6.626	.001**	.244	.115
	Controllability	3.16 (± .90)	2.89 (± .79)	3.02 (± .92)	3.473	.024*	.345	.445
CP19-S		68.95 (± 17.90)	69.35 (± 16.51)	74.25 (± 17.26)	4.220	.978	.025*	.042*
ATV-COVID-19		3.53 (± .64)	3.52 (± .76)	3.49 (± .62)	.137	.986	.886	.933

Group 1: People who had not contracted the virus before; Group 2: People who had contracted the virus and were treated at home; Group 3: People who had contracted the virus and were treated in the hospital, SD: Standard deviation, p¹: Group-1 vs Group-2, p²: Group-1 vs Group-3, p³: Group-2 vs Group-3, **: p= 0.01, *p< 0.05, PCo-COVID-19: Perception of control of COVID-19, ATV-COVID-19: Attitudes towards the COVID-19 vaccine, CP19-S: COVID-19 phobia scale.

Table 4. Pearson correlation analysis between scaled scores

		PCo-COVID-19 Macro-control	PCo-COVID-19 Micro-control	PCo-COVID-19 Controllability	CP19-S	ATV-COVID-19
PCo-COVID-19	Macro-control	r	1	.401**	.128**	.004
	Micro-control	r	.401**	1	.096*	-.021
	Controllability	r	.128**	.096*	1	-.102*
CP19-S	r	.004	-.021	.102*	1	-.012
ATV-COVID-19	r	.199**	.155**	.161**	-.012	1

** : p< 0.01, *p< 0.05, PCo-COVID-19: Perception of control of COVID-19, ATV-COVID-19: Attitudes towards the COVID-19 vaccine, CP19-S: COVID-19 phobia scale.

Table 5. Regression analysis for the evaluation of predictors of vaccine positive attitude

	Unstandardized Coefficients		Standardized Coefficients	95% CI (LL/UL)	t	p	Adjusted R ²
	B	SE	B				
Age	-.001	.002	-.013	-.005/.004	-.257	.797	.078
Sex	.095	.066	.068	-.035/.225	1.435	.152	
Presence of a family history of COVID-19	.060	.065	.044	-.068/.188	.921	.357	
Additional diseases	.063	.084	.040	-.101/.227	.752	.452	
Macro-control	.131	.037	.180	.057/.205	3.496	.004*	
PCo-COVID-19 Micro-control	.070	.039	.093	-.006/.146	1.801	.072	
Controllability	-.149	.037	.193	.221/.076	-4.035	.035*	
CP19-S	.000	.002	.007	-.003/.004	.140	.889	

SE: Standard error, LL: Lower level, UL: Upper level, CI: Confidence interval, *p< 0.05.

Finally, a simple linear regression analysis was applied to evaluate the predictors of positive vaccination attitudes. Accordingly, it was determined that PCo-COVID-19 macro-control ($\beta = 0.180$) and PCo-COVID-19 controllability ($\beta = 0.193$) predicted positive vaccination attitudes positively [F (8.417): 3.958, $p < 0.001$ with an adjusted R square = 0.78] (Table 5).

DISCUSSION

According to our findings, PCo-COVID-19 micro-control and controllability had higher scores in Group-1 and CP19-S scores were highest in Group-3. Among the groups, only the answer "I am not sure about the effect/I will get the vaccine" was higher in Group-3 in vaccination attitudes. On the other hand, on ATV-COVID-19, a positive predictiveness of PCo-COVID-19 macro-control and controllability was detected. The possible interpretations of our findings are shared below.

First, a comparison was made between the patients who did not have COVID-19, the patients who contracted the virus as outpatients, and the patients who contracted the disease as inpatients. It was determined that older males with lower education levels and people living in the same household experienced COVID-19 treatment as hospitalized patients. Older age and additional ailments may adversely affect the progression of the virus in the process. Hence, it is expected that these patients will generally have a more negative clinical image and need

hospitalization. The difference in demographic data between these groups may be due to this situation.

Although some studies have found higher vaccine rejection rates for younger individuals^[17,18] and women^[17,18], these findings are inconsistent in the literature, with some studies finding no association^[19,20]. In our study, age, sex, and presence of additional ailments did not predict attitudes toward vaccination.

According to the data obtained, 82.6% of the participants reported that they were or will be vaccinated, 6.17% were undecided about the vaccine, and 11.21% would not be vaccinated. An evaluation of the reasons for vaccine refusal showed that a large group of those who reject the vaccine did not know the effects of the vaccine. In addition, there is a prejudice arising from not knowing the components of the vaccine. Studies have found that trust in vaccines is directly related to public awareness of infectious diseases^[21]. A large-scale study of "attitudes toward vaccines" has shown that countries that conduct active public awareness campaigns on the safety, efficacy, and importance of vaccines against various infectious diseases are highly successful^[22]. With the widespread use of smartphones, an increasing number of people can access the information they want via online research and social media. While these are efficient ways for an individual to gain knowledge on vaccination, information that is incomplete,

inconsistent, or factually incorrect (such as anti-vaccine messages and conspiracy theories) can lead them to making the wrong decision. In order to raise awareness about COVID-19, reporting impartially and transparently by the media, facilitating access to accurate information, informing the public of healthcare professionals, and neutralizing conspiracy theories or misleading claims are among the health policies that should be made during the pandemic. In addition, health authorities are the most reliable sources on vaccines. Thus, informing the public about how vaccines are made, how they work, what they contain, how they will be tested, and their effectiveness, possible risks, and side effects will reduce vaccine prejudice.

Another reason for vaccine rejection in our study was religious reasons. Conspiracy theories related to religious beliefs have also been shown in previous studies^[23]. Religious prejudices can be overcome by involving religious leaders who are informed about vaccination in health promotion and awareness about COVID-19.

In a study conducted in Türkiye in May 2020, it was reported that vaccine acceptance rate was 66%^[15]. In our study, acceptance rate was 82.6%. The reason for this may be the progress of the pandemic. Also, in the study conducted in May 2020, vaccine application had not yet started in Türkiye, and the fact that clearer ideas were obtained about the effects and possible side effects of the vaccine with the introduction of the vaccine may have reduced the hesitation in taking the vaccine. In addition, the fact that 2/3 of our participants had COVID-19 may have changed the perception of contagious diseases and increased vaccine acceptance. Finally, the group that reported that they would be vaccinated even if they did not trust its efficacy was significantly higher in hospitalized patients. Making simplistic comments about the possible negative effects of COVID-19 (for example, claiming that it is not different from seasonal flu) can reduce people's agency in making choices about preventive measures, such as vaccination. Our findings indicate that acceptance to get vaccinated increases in people who have

had a serious illness, even if they have their doubts about vaccination.

Those who had COVID-19 had lower PCo-COVID-19 micro-control and controllability scores than those who did not. Contracting the virus is often closely related to people not taking adequate precautions. Therefore, the PCo-COVID-19 micro-control scores may be lower for those who have never had COVID-19. It may also lead to a lowering of expectations about the controllability of the disease (PCo-COVID-19 controllability). The pandemic, which is followed remotely from social media or news bulletins as if it will not affect the individual, becomes the center of their life when they get sick. Therefore, seeing that the epidemic can also infect them causes them to realize the severity of the pandemic more. Therefore, it can be said that the PCo-COVID-19 controllability scores were determined to be low.

Moreover, positive correlations were also found between vaccination attitudes and perception of control subscales. Vaccination plays an important role in controlling the virus. Vaccine administration is a solution against the virus (PCo-COVID-19 controllability), and the supply of vaccines is related to the ability of states and health systems to produce solutions (PCo-COVID-19 macro-control). In addition, the solution needs to support the vaccination of people with their preferences in a process where the states do not mandate the vaccine (PCo-COVID-19 micro-control). Therefore, it can be expected that all three sub-dimensions have existing correlations.

Finally, the predictability of PCo-COVID-19 macro-control and controllability regarding vaccine attitudes has been demonstrated. Confidence in healthcare systems as well as confidence in the positive impact of vaccines can have a significant impact on vaccine attitudes. It has been shown that the rate of refusal and delay in receiving the COVID-19 vaccine is higher before the necessary information is given about its safety and efficacy^[24]. It has also been reported in studies that anti-vaccine groups and conspiracy theories increase distrust in health authorities

and government institutions and cause hesitations about vaccination^[25,26]. In addition, proving the high efficacy and safety of COVID-19 vaccines can increase confidence in vaccines and reduce vaccine hesitancy. Studies have reported a lower perception of confidence in the government and its measures, healthcare response, and information provided by health authorities as factors associated with COVID-19 vaccine hesitancy^[27,28]. Confidence in the vaccine is crucial, as intention to receive it is strongly associated with a belief in its safety and efficacy. Individuals should be made more aware with various mass media—information should be provided on herd immunity, vaccine safety, and how vaccines can help people return to their daily lives^[29,30]. Therefore, governments and health authorities should step up their efforts to promote trust in vaccines and reduce misinformation.

The first limitation of this study is that there are differences in demographic distribution between groups because the treatment of people with advanced age and additional diseases is more complex, and they need inpatient treatment. The second limitation is that surveys are self-report scales and may cause reporting bias. Finally, this study is a cross-sectional study, with a limited number of participants in a particular region. Thus, larger and more prospective studies are needed. Nevertheless, in this study, the thoughts and vaccination attitudes of participants in three different situations regarding the pandemic were evaluated, and it was determined that the patient's medical history affects the perception of COVID-19 control and, in this case, the vaccination attitude.

Recent estimates of COVID-19 require that 60–75% of people in the population have enough immunity to stop the transmission and rapid spread of the virus^[31,32]. The most appropriate way to ensure this immunity seems to be vaccination, and vaccine hesitancy may hinder the successful control of the COVID-19 pandemic. Thus, it is important to determine the factors related to vaccine hesitancy and devise solutions while arranging health policies.

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ETHICS COMMITTEE APPROVAL

This study was approved by Ankara City Hospital Clinical Research Ethics Committee (Date: 16.06.2021, Decision no: E2-21-579).

CONFLICT of INTEREST

None of the authors had conflict of interest.

AUTHORSHIP CONTRIBUTIONS

Concept and Design: RÖ, ZAY

Data Collection or Processing: RÖ, ZAY

Analysis/Interpretation: RÖ, ZAY

Review and Correction: RÖ, ZAY

Writing: RÖ, ZAY

Final Approval: RÖ, ZAY

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