



Knowledge Levels of Individuals about the Impact of COVID-19 Infection on Cardiovascular Diseases

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ABSTRACT

Purpose: The study was planned and administered as a descriptive study to determine knowledge levels of individuals on the effect of COVID-19 infection on cardiovascular diseases. **Method:** The study was administered from 20th October to 20th January 2021 in Turkey by including 501 individuals, who were subjected to home lockdown due to COVID-19, meet inclusion criteria, and were willing to attend the study. Socio-demographic data collection form, question form for knowledge on COVID-19, and assessment form for knowledge on the effect of COVID-19 infection on cardiovascular diseases were used. **Results:** It was found that, of the attendants, the average age was 34.89 ± 12.01 and 72.9% were women. The majority of individuals stated that they agreed that COVID-19 was respiratory disease (84.9%), an infectious disease (96.8%), and was transmitted by touching contaminated surfaces (74.7%). It was determined that those who stated that the duration of symptoms of COVID-19 was between 2-14 days, was majority (90.4%). The majority of individuals (94.2%) stated that they agreed that COVID-19 poses risk in those with hypertension and heart disease and disagreed that the risk of transmitting COVID-19 to individuals with heart disease is minimal (87%). It was found that those (34.9%) who agree that complaint of fatigue, a symptom of COVID-19, is a risk for development of heart disease, those who disagree (31.9%), and those who do not know this (33.1%) were in similar rates. **Conclusion:** It was found that individuals who attended the study had good knowledge about COVID-19 infection and effects on heart disease; however, they were inadequate to know symptoms of COVID-19.

Keywords: Cardiovascular disease, Knowledge level, Infection, Symptom, COVID-19

INTRODUCTION

COVID-19 infection is caused by a virus first seen in China in 2019, after which the coronavirus pandemics of Severe Acute Respiratory Syndrome (SARS-CoV) and Middle East Respiratory Syndrome (MERS-CoV) emerged [1,2]. On 31 December 2019, the World Health Organization (WHO) China National Office reported pneumonia cases of unknown etiology in the Wuhan province of Hubei. On the 7th of January 2020, the virus was defined as a novel coronavirus, which had not been detected in humans previously (2019-nCoV). The WHO announced the virus spread like a pandemic in March 2020. Afterward, the disease of 2019-nCoV was defined as Coronavirus disease-2019 (COVID-19) and the virus was named SARS-CoV-2 due to close similarity to SARS-CoV [3].

COVID-19 is transmitted to humans through droplets. Contamination may occur *via* the contact of individuals with the droplets spread from other people through coughing and sneezing that may suspend in the air for several hours and reach a 7 m-8 m distance through touching their hands or noses [3]. Respiratory system and gastrointestinal tract symptoms begin within 14 days after contamination [3,4]. Coronaviruses lead to severe respiratory distress and fever besides common cold-like symptoms. The most common findings include fever, dyspnea, dry cough, and ground glass appearance on computed tomography of the chest. Increased bowel movements, diarrhea, nausea, vomiting, altered

senses of taste and smell, visual disturbances, muscle, and joint ache, fatigue, and rash have also been observed in many subjects [5].

According to the data from many studies, individuals who developed cardio-vascular symptoms were the most affected and demonstrated the highest mortality [6]. In the literature, acute respiratory tract infections elaborate the disease through contaminating the host together with the ACE2 receptor, which plays a protective role in the lungs. ACE2 receptors are found in cardiac tissue and the lungs [7]. Hence, besides severe dyspnea, acute respiratory tract infections including influenza and pneumonia are known to lead to cardiovascular symptoms and diseases such as myocarditis, pulmonary edema, heart failure, and arrhythmias [8]. Similarly, coronaviruses lead to systemic inflammation by utilizing the ACE2 receptors. COVID-19, which causes acute respiratory failure by affecting the lungs mostly affects cardio-vascular diseases through triggering myocardial injury and cardiac dysfunction [9,10]. The China National Health Commission reported that some patients presented with cardiovascular symptoms initially and those individuals experienced palpitation, altered blood pressure, chest pain, and dyspnea, rather than fever or cough [11].

COVID-19 increases morbidity and mortality by chronic damage developing through acute myocardial injury and cardiac dysfunction while causing severe acute respiratory syndrome [12,13]. Therefore, in individuals who do not have cardiovascular diseases, the development of myocardial injury and myocarditis, Heart Failure (HF), and hypertension may be predicted by analyzing coronavirus pandemic studies [8,14]. COVID-19 may lead to Myocardial Infarction (MI) and myocarditis through impairing the lipid and glucose metabolism in subjects who develop a myocardial injury, as in previous coronavirus spreads. The disease is suggested to lead to the development of hypertension, tachycardia, and cause a progression in HF, Acute Coronary Syndrome (ACS), MI symptoms, and sudden death in the future [10,15].

Cardio-Vascular Disease (CVD) and cardiovascular risk factors render the individuals vulnerable to COVID-19, and COVID-19 may trigger the progression of the underlying cardiovascular disease [12]. Hence, more care should be taken as protective measures for detecting the underlying disease in the early period and preventing the deterioration of the disease. Sufficient knowledge of the preventive measures for COVID-19 and what to do when symptoms occur would improve the quality of life of patients with cardiovascular diseases and underlying diseases [16]. Based on these data, the study was conducted to investigate the knowledge level of the participants regarding the effect of COVID-19 on cardiovascular diseases.

METHODS

The Objective and Design of the Study

The study was conducted as a descriptive study between 20th October 2020 and 15th January 2021 by using an online questionnaire due to social distancing and contact restriction in Turkey in the context of the COVID-19 pandemic. It was aimed to investigate the knowledge level of the participants regarding the influence of COVID-19 on cardiovascular diseases.

The Universe and Sample of the Study

Individuals of 18 years of age and above who had been subjected to the COVID-19 pandemic in Turkey between 20th October 2020 and 20th January 2021, who had been informed about the aim of the study and the expectations from the study, who fulfilled the inclusion criteria and who volunteered for participation were included in the study. With simple random sampling calculation, the number of subjects to be included in the study was found to be 385 to obtain 80% power at the level of $\alpha=0.05$ considering the 3-month research period, but considering the drop-outs, 500 adult individuals were included in the study. Individuals who agreed to participate in the study, who had been exposed to the COVID-19 pandemic, aged 18 and over were included in the study. Individuals under the age of 18, who were not willing to participate in the study, were excluded. Two subjects were not included in the sample as they did not give their consent. In this context, 501 individuals were included in the study.

Data Collection Tools

The data were collected through the “socio-demographic data collection form”, the “Level of knowledge regarding

COVID-19” created using the COVID-19 guide published by the Ministry of Health of Turkey, and the “Questionnaire form evaluating the knowledge level regarding the influence of COVID-19 on cardio-vascular diseases”.

Socio-demographic data collection form: The form created by the researchers included the questions inquiring age, gender, marital status, educational status, socio-demographic status, profession, and chronic diseases [3,10,12,17-19].

Questionnaire form of knowledge level about COVID-19: The questionnaire form created by the researchers through COVID-19 Infection Information Guides prepared by the Ministry of Health of Turkey evaluated the agreement status of the participants about the answers [3,14,18,19]. The participants were asked to respond to the Likert-type questions as “I agree”, “I don’t agree”, “I don’t know”/“I am not sure”.

Assessment of the level of knowledge on the effect of COVID-19 infection on cardiovascular disease questionnaire form: This form created by the literature included questions aiming at determining the level of knowledge of individuals about the effect of COVID-19 infection on cardiovascular disease [3,12,18,19]. The participants were asked to respond to the Likert-type questions as “I agree”, “I don’t agree”, “I don’t know”/“I am not sure”.

Ethical Considerations

The ethics approval was obtained from the Ethics Committee of a state university (numbered 2020-155) before the study. Individuals who were willing to participate in the study were informed about the purpose and expectations of the study following the Declaration of Helsinki, and written consents were obtained by voluntary participation. In the study, the data were collected by using an “online survey” application between the 20th of October 2020 and 20th of January 2021 due to the application of social distancing and contact restrictions within the scope of the COVID-19 pandemic.

Statistical Analyses

Statistical analyses were carried out using the IBM SPSS Windows 21.0 package program (IBM Corp. Armonk, N.Y. USA). In the statistical evaluation of the study, numerical and percentage distributions were used for the qualitative and numerical variables, and the Pearson Chi-square test was used for comparing the qualitative data. The results were evaluated at the 95% confidence interval and the significance level of $p < 0.05$.

RESULTS

The mean age of the participants was 34.89 ± 12.01 years. Of the participants, 72.9% were females and 48.7% were single, 11.4% were not working, 24.6% were found to have a chronic disease and 4.0% had a cardiovascular disease. Of the participants, 42.7% were found to have a COVID-19 test and the test result was positive in 10.2% (Table 1).

Table 1 Distribution of socio-demographic features (N=501)

Features		n	%
Gender	Female	365	72.9
	Male	136	26.1
Age	18-24	113	22.6
	25-44	239	47.7
	45-70	149	29.7
Marital Status	Married	257	51.3
	Single	244	48.7
Education Status	Elementary-intermediate school	19	3.8
	High school	61	12.2
	University	421	84
Income Status	Income is lower than expenses	101	20.2
	Income is in balance with expenses	312	62.3
	Income is higher than expenses	88	17.6

Having a COVID-19 Test	Yes	214	42.7
	No	287	57.3
COVID-19 Test Result	Negative	164	32.7
	Positive	51	10.2
Profession	Educationist	106	21.2
	Healthcare worker	265	52.9
	Security	11	2.2
	Service sector (cargo/food/cleaning/transportation)	62	12.4
	Housewife and/or not working	57	11.4
Chronic Disease Status	Yes	123	24.6
	No	387	75.4
Chronic Diseases	Cardio-vascular disorder	20	4
	Hypertension	23	4.6
	Asthma/Chronic pulmonary disease	26	5.2
	Diabetes	8	1.6
	Others (epilepsy, osteoporosis, depression, etc.)	54	41.2

In the study, 84.9% of the individuals stated that COVID-19 was a respiratory disease, 96.8% stated that it was an infectious disease, 96.2% stated that it was transmitted directly through droplets, 74.7% stated that it was transmitted by contact with surfaces, and 95.6% by not obeying the social distancing rules (Table 2). Most of the participants (90.4%) stated that the duration of the symptoms of infection was 2-14 days and that the infection was a risk factor for chronic diseases such as hypertension, heart attack, asthma, and COPD (97.6%) (Table 2).

Table 2 Distribution of the knowledge level of COVID-19 infection (N=501)

S. No.	Items	I agree	I don't agree	I am not sure/I don't know
		n (%)	n (%)	n (%)
1.	COVID-19 is a respiratory disease caused by a coronavirus	423 (84.9)	30 (6.0)	48 (9.6)
2.	Is COVID-19 infection contagious?	485 (96.8)	2 (0.4)	14 (2.8)
3.	Please mark your agreement status about the following statements.			
	-COVID-19 infection is transmitted by droplets directly during cough and sneezing	482 (96.2)	7 (1.4)	12 (2.4)
	-COVID-19 infections are transmitted by contact with contaminated surfaces.	374 (74.7)	61 (12.2)	66 (13.2)
	-COVID-19 infections are transmitted by not obeying the physical and social distancing rules.	479 (95.6)	6 (1.2)	16 (3.2)
	-COVID-19 infections are transmitted through direct contact with infected people.	442 (88.2)	36 (7.2)	23 (4.6)
4.	COVID-19 infection is of higher risk in individuals who have cardiac disorders like hypertension, heart attack, and respiratory disorders like asthma and COPD.	489 (97.6)	4 (0.8)	8 (1.6)

5.	Knowledge level about the preventions for transmission of COVID-19 infection	-		-	-	
	-Hands should be washed with water and soap for at least 20 seconds.	492 (98.2)		2 (0.4)	7 (1.4)	
	-Eyes, nose, and mouth should not be touched.	492 (98.2)		2 (0.8)	5 (1)	
	-Contact with people subjected to infection should be avoided.	496 (99.0)		2 (0.4)	3 (0.6)	
	-Masks should be worn only when walking in the street and traveling in public vehicles.	92 (18.4)		399 (79.6)	10 (2.0)	
	-Gloves should be worn before touching any surfaces.	228 (45.5)		220 (43.9)	8 (10.6)	
6.	What is the duration for the onset of COVID-19 infection symptoms?	<2 days	25 days	2-14 days	I don't know	
		n (%)	n (%)	n (%)	n (%)	
		16 (3.2)	6 (1.2)	453(90.4)	26(5.2)	
7.	What would you do if you notice disease symptoms?	I stay at home and call the health institution.	I stay at home for 14 days and wait for getting well.	I go to the closest hospital.	I don't exactly know what to do.	
		n (%)	n (%)	n (%)	n (%)	
		244 (48.2)	36 (7.2)	215(42.9)	6(1.2)	
8.	What are the reliable information sources about COVID-19 infection?	Health care workers	Newspapers, magazines	Internet or social media	Social groups (friends, neighbors)	None
		n (%)	n (%)	n (%)	n (%)	n (%)
		458 (91.4)	79 (15.8)	63 (12.9)	1 (0.2)	37 (7.4)
9.	Symptoms of COVID-19 infection	Yes		No		
		n (%)		n (%)		
	High fever	494 (98.6)		7 (1.4)		
	Cough	467 (93.2)		34 (6.8)		
	Sore throat	419 (83.6)		82 (16.4)		
	Respiratory distress	471 (94.0)		30 (6.0)		
	Itching	57 (11.4)		444 (88.6)		
	Diarrhea	367 (73.3)		134 (26.7)		
	Abdominal pain	197 (39.3)		304 (60.7)		
	Joint pain	437 (87.2)		83 (12.6)		
	Headache	384 (76.6)		117 (23.4)		
	Walking difficulty	115 (23.0)		386 (77.0)		
	Loss of taste	456 (97.0)		45 (9.0)		
	Hearing impairment	67 (13.4)		434 (86.6)		
	Visual disturbance	49 (9.6)		453 (90.4)		
	Alopecia	488 (97.4)		13 (2.6)		

The rate of participants who agreed that COVID-19 infection would facilitate contracting cardiac diseases was 39.9%; the rate was 20.6% for those who did not agree and 39.5% for those who did not know or who were not sure (Table 3).

The rate of participants who agreed that COVID-19 infection would facilitate the development of cardiac diseases in subjects who have a family history of cardiac diseases was 39.7%; the rate was 44.1% for those who did not know or who were not sure (Table 3). Most of the participants (73.1%) were found to agree that doing regular exercises would help gain resistance against COVID-19 infection and that tightness in the chest, chest pain, and palpitation would lead to a risk for the development of cardiac diseases (64.5%) (Table 3).

Table 3 Distribution of the knowledge level regarding the influence of COVID-19 infection on cardiovascular disorders (N=501)

S. No.	Items	I agree	I don't agree	I am not sure/I don't know
		n (%)	n (%)	n (%)
1.	COVID-19 infection leads to poor outcomes in subjects with cardiac diseases.	437 (87.2)	12 (2.4)	52 (10.4)
2.	COVID-19 infection is risky in patients who have hypertension and cardiac diseases.	472 (94.2)	2 (0.4)	27 (5.4)
3.	Consumption of fatty and high-carbohydrate food and little vegetables leads to a risk for cardiac diseases.	352 (70.3)	45 (9.9)	104 (20.8)
4.	COVID-19 infection facilitates the development of cardiac diseases.	20 (39.9)	103 (20.6)	198 (39.5)
5.	COVID-19 infection may lead to the development of cardiac diseases in subjects who have a family history of cardiac diseases.	199 (39.7)	81 (16.2)	221 (44.1)
6.	Doing regular exercises would help gain resistance against COVID-19 infection.	366 (73.1)	47 (9.4)	88 (17.6)
7.	Stress and sadness due to COVID-19 infection increase the risk for cardiac diseases.	348 (69.5)	41 (8.2)	112 (22.4)
8.	Elderly subjects who contract COVID-19 infection do not carry the risk for cardiac diseases.	41 (8.2)	370 (73.9)	90 (18.0)
9.	The risk of transmitting COVID-19 infection to individuals with heart disease is negligible.	23 (4.6)	436 (87.0)	42 (8.4)
10.	Dyspnea, which is among the symptoms of COVID-19 infection, causes a risk in subjects who have cardiac diseases.	323 (64.5)	59 (11.8)	119 (23.8)
11.	Chest tightness, chest pain, and palpitation, which are among the symptoms of COVID-19 infection, cause a risk for the development of cardiac diseases.	323 (64.5)	59 (11.8)	119 (23.8)
12.	Loss of appetite, which is among the symptoms of COVID-19 infection, causes a risk for the development of cardiac diseases.	117 (23.4)	220 (43.9)	164 (32.7)
13.	Fatigue and tiredness, which are among the symptoms of COVID-19 infection, cause a risk for the development of cardiac diseases.	175 (34.9)	160 (31.9)	166 (33.1)

The rates of females who believed that having COVID-19 infection would facilitate the development of cardiac diseases ($p=0.003$), that stress and sadness due to having COVID-19 infection would increase the risk for cardiac diseases ($p=0.019$), and that loss of appetite due to COVID-19 infection would cause a risk for development of cardiac diseases were higher than males and the difference was statistically significant (Table 4).

Table 4 Distribution of the knowledge level regarding the influence of COVID-19 infection on cardiovascular disorders according to gender (N=501)

S. No.	Items	Gender	I agree	I don't agree	I am not sure/ I don't know	Pearson Chi-square
			n (%)	n (%)	n (%)	
1.	COVID-19 infection leads to poor outcomes in subjects with cardiac diseases.	Female	321 (87.9)	8 (2.2)	36 (9.9)	$\chi^2=0.657$
		Male	116 (85.3)	4 (2.9)	16 (11.8)	$p=0.720$

2.	COVID-19 infection is risky in patients who have hypertension and cardiac diseases.	Female	346 (94.8)	2 (0.5)	17 (4.7)	$\chi^2=2.129$
		Male	136 (92.6)	0 (.0)	10 (7.4)	p=0.345
3.	Consumption of fatty and high-carbohydrate foods and little vegetables leads to a risk for cardiac diseases.	Female	256 (70.1)	31 (8.5)	78 (21.4)	$\chi^2=.603$
		Male	96 (70.6)	14 (10.3)	26 (19.1)	p=0.740
4.	COVID-19 infection facilitates the development of cardiac diseases.	Female	130 (35.6)	84 (23.0)	151 (41.4)	$\chi^2=11.343$
		Male	70 (51.5)	19 (14.0)	47 (34.6)	p=0.003
5.	COVID-19 infection may lead to the development of cardiac diseases in subjects who have a family history of cardiac diseases.	Female	131 (35.9)	64 (17.5)	170 (46.6)	$\chi^2=8.369$
		Male	68 (50.0)	17 (12.5)	51 (37.5)	p=0.150
6.	Doing regular exercises would help gain resistance against COVID-19 infection.	Female	259 (71.0)	38 (10.4)	68 (18.6)	$\chi^2=3.196$
		Male	107 (78.7)	9 (6.6)	20 (14.7)	p=0.202
7.	Stress and sadness due to COVID-19 infection increase the risk for cardiac diseases.	Female	242 (66.3)	36 (9.9)	87 (23.8)	$\chi^2=7.885$
		Male	106 (77.9)	5 (3.7)	25 (18.4)	p=0.019
8.	Elderly subjects who contract COVID-19 infection do not carry the risk for cardiac diseases.	Female	26 (7.1)	273 (74.8)	66 (18.1)	$\chi^2=2.019$
		Male	15 (11.0)	97 (71.3)	24 (17.6)	p=0.364
9.	The risk of transmitting COVID-19 infection to individuals with heart disease is negligible.	Female	12 (3.3)	323 (88.5)	30 (8.2)	$\chi^2=5.350$
		Male	11 (8.1)	113 (83.2)	12 (8.8)	p=0.069
10.	Dyspnea, which is among the symptoms of COVID-19 infection, causes a risk in subjects who have cardiac diseases.	Female	229 (62.7)	46 (12.6)	90 (24.7)	$\chi^2=1.868$
		Male	94 (61.9)	13 (9.6)	29 (21.3)	p=0.393
11.	Chest tightness, chest pain, and palpitation, which are among the symptoms of COVID-19 infection, cause a risk for the development of cardiac diseases.	Female	229 (62.7)	46 (12.6)	90 (24.7)	$\chi^2=1.868$
		Male	94 (69.1)	13 (9.6)	29 (21.3)	p=0.393
12.	Loss of appetite, which is among the symptoms of COVID-19 infection, causes a risk for the development of cardiac diseases.	Female	70 (19.2)	178 (48.8)	117 (32.1)	$\chi^2=17.444$
		Male	47 (34.6)	42 (30.9)	47 (34.6)	p=0.000
13.	Fatigue and tiredness, which are among the symptoms of COVID-19 infection, cause a risk for the development of cardiac diseases.	Female	256 (30.7)	31 (35.6)	78 (33.7)	$\chi^2=0.603$
		Male	96 (46.3)	14 (22.1)	26 (31.6)	p=0.740

DISCUSSION

The study aimed to investigate the level of knowledge of individuals about the effect of COVID-19 infection on cardiovascular diseases. Knowledge about infectious disease, attitudes, and behaviours for prevention methods affect the course of the disease, its spread rate, and mortality [16,20]. COVID-19 infection is an important risk factor for chronic diseases besides causing pneumonia. The Center for Disease Control and Prevention (CDC) reported that 89.3% of individuals exposed to COVID-19 infection had a history of one or more chronic diseases. Individuals with Hypertension (HT), Cardiovascular Diseases (CVD), diabetes, and Chronic Obstructive Pulmonary Disease (COPD), which are among the most common chronic diseases, have been reported to be vulnerable to infection. In the present study, it was determined that 24.6% of the individuals had chronic diseases, 4% had cardiovascular disease, 4.6% had hypertension, 1.6% had diabetes and 5.2% had asthma-chronic pulmonary diseases (Table 1). Individuals with cardiovascular disease constitute the group of chronic diseases most affected by COVID-19 infection and who lost their lives to a great extent [10,21]. In the study, 61.5% of the individuals with hypertension were determined to have a positive COVID-19 test result ($\chi^2=16.679$; $p=0.002$). This result supports that the presence of chronic diseases is risky for COVID-19 infection, consistent with the literature [1,6,9,12]. In the study of Yu, et al. conducted with 121 subjects affected by SARS-CoV disease, 12 patients had cardiovascular disease, and of these, 72% had tachycardia, 50% had hypertension, 15% had bradycardia and 11% had heart failure [22]. COVID-19 infection causes increased troponin elevation, more frequent symptoms including severe respiratory failure, arrhythmia, chest pain, and hypertension [23].

According to the report of the World Health Organization, although COVID-19 infection is generally seen in the elderly and the male gender, it is a risk for the development of severe disease and mortality in those with a co-morbid chronic disease such as hypertension, diabetes, Chronic Obstructive Pulmonary Disease (COPD) and cardiovascular disease [1,24]. In a meta-analysis report in which chronic diseases affected by COVID-19 infection were monitored, it was found that hypertension was common in approximately 21.1% of the patients, and the rates for diabetes, cardiovascular disease, and respiratory diseases such as asthma-COPD were determined as 9.7%, 8.4%, and 1.5%, respectively [12]. It was found that 27.7% of the individuals with chronic diseases were female and 16.2% were male ($\chi^2=7.068$; $p=0.008$). It was found that 30.4% of those with cardiovascular disease were male, 12% were female, and the rate of males was 17.4% and females were 17.6% among those with hypertension ($\chi^2=10.296$; $p=0.036$). It was also found that 35% of those with positive test results were males and 19.4% were females ($\chi^2=5.852$; $p=0.016$).

COVID-19 infection is easily transmitted by binding to the ACE2 receptor, which is found in Type II alveolar cells of the lungs and plays a role in protecting the lungs [25]. The ACE2 receptor is found mostly in heart tissues following lung tissues. Therefore, severe respiratory failure is associated with myocardial damage and increased troponin [9]. In the study of Guo, et al. 35.3% of the subjects with COVID-19 infection were determined to have an underlying cardiovascular disease including HT, coronary heart disease, cardiomyopathy, and 27.8% were shown to have elevated troponin levels, which is an indicator of myocardial damage [7]. In the same study, individuals with underlying CVD were found to have higher troponin T levels than those without CVD [7]. Studies have found elevated troponin and myocardial damage between 22%-31% in hospitalized individuals exposed to COVID-19 infection [1,26,27]. COVID-19 infection may cause myocardial damage and myocarditis by directly or indirectly affecting the cardiovascular system [28]. As seen in the literature data, COVID-19 infection can increase the risk of heart disease and worsen the course of heart disease [29]. The awareness of individuals of the effects of COVID-19 on the cardiovascular system will enable those who have been exposed to the infection to recognize the symptoms early and seek help for prompt intervention. In this context, it is important to learn what individuals know.

It has been reported in the literature that individuals exposed to COVID-19 infection are admitted to the hospital due to cardiovascular symptoms such as palpitations, changes in blood pressure, chest pain, and tightness, rather than fever and respiratory symptoms such as cough [30,31]. For this reason, the individual's understanding of the association between cardiovascular symptoms and COVID-19 is important. In the present study, the majority of the participants stated that COVID-19 infection could be transmitted to individuals with cardiac disease (87%), that it affected individuals with cardiac disease to a higher extent (87.2%), that exposure to COVID-19 would facilitate the development of cardiac disease (39.9%), that dyspnea caused a risk in patients with cardiac diseases (64.5%) and complaints such as chest tightness, chest pain, and palpitation caused a risk for development of cardiac disease (Table 3).

According to Turkey's Statistical Agency data, 78.7% of the elderly in Turkey and 86% of the elderly in developed countries die due to chronic diseases [32]. The Center for Disease Control and Prevention (CDC) reported that COVID-19 infection mainly affected the elderly and individuals with chronic diseases [33]. In the present study, 24.1% of those who reported having a chronic disease were found to have been tested positive for COVID-19 ($\chi^2=0.005$; $p=0.944$); however, 61.5% of the participants with a diagnosis of hypertension tested positive for COVID-19 ($\chi^2=16.679$; $p=0.002$). In the study, it was also found that 33.3% of those with positive COVID-19 test results were in the 18-24 age group, 21.7% in the 25-44 age group, and 22.4% in the 45-70 age group ($\chi^2=2.001$; $p=0.368$).

Cardiovascular diseases, hypertension, coronary artery disease, and heart failure increase with age, and deaths are most common in elderly individuals due to cardiovascular disease [34,35]. In the present study, 52% of the subjects with chronic diseases were in the 45-70 age group, 38.2% were in the 25-44 age group and 9.8% were found to be in the 18-24 age group ($\chi^2=42.159$; $p=0.000$). It was found that 18.2% of those with cardiovascular disease were in the 45-70 age group, 12.2% were in the 25-44 age group, 12.5% were in the 18-24 age group, and 33.3% of those with hypertension were in the 45-70 age group ($\chi^2=33.183$; $p=0.000$). Gao, et al., detected hypertension in 29.5% of the subjects and reported that hypertensive patients had severe disease and required mechanical ventilation at a higher rate [36]. In a study conducted in Italy, 11% of the individuals between the ages of 21-40 with COVID-19 infection were found to have hypertension; this rate was 26% in those aged 41-50, 62% in those between the ages of 71-80, and 75% in those between the ages of 81-90 [37].

According to the literature, individuals with hypertension and cardiac diseases, mainly the elderly people infected with COVID-19, have a great risk. Therefore, these people need to be aware of the COVID-19-related risks. In the present study, 73.9% of the participants were found not to agree that COVID-19 infection carried a risk for cardiac diseases in the elderly and 94.2% agreed that the infection caused a risk in subjects with hypertension and cardiac diseases (Table 3).

The importance of strong immunity, balanced nutrition, and being physically active to fight against COVID-19 is clear. Nutrition is particularly important in individuals with chronic diseases [38]. Consuming carbohydrate-rich, saturated fat-rich, and low fiber diets and lacking physical activity are risk factors that should be addressed in the prevention of cardiovascular diseases [39]. In this context, most of the participants were found to agree that when exposed to COVID-19 infection, consuming excessive fat, abundant carbohydrates, and fewer vegetables would pose a risk for cardiac disease (70.3%) and regular exercise would help gain resistance against COVID-19 infection (73.1%) (Table 3).

When neurological findings are added to the effect of COVID-19 infection on the immune system, individuals experience complaints of fatigue and weakness [40]. In cardiovascular diseases, the symptom of fatigue is a common finding that affects the daily activities of individuals. Fatigue may be effective in the decrease in physical activities, stress, anxiety, and deterioration in sleep quality. Together with the effects of fatigue experienced by individuals, it is a risk factor for cardiovascular diseases [41]. In this study, it was determined that 34.9% of the individuals agreed that their symptoms of fatigue and weakness, which are symptoms of COVID-19 infection, would pose a risk for the development of cardiac disease, but 31.9% did not agree with this information and 33.1% did not have information about this issue (Table 3).

Respiratory failure developing due to COVID-19 infection is reported to be associated with the effect of the infection on the central nervous system. When respiratory failure develops, neurological findings such as sleep problems, fatigue, headache, nausea, vomiting, and decreased appetite are also observed [40]. However, in this study, it was determined that the majority (43.9%) did not agree that the complaint of decreased appetite, which is one of the symptoms of COVID-19 infection, would pose a risk for the development of cardiac disease (Table 3). The participants were found not to have sufficient information on this subject.

CONCLUSION

In conclusion, it was found that the knowledge level of the individuals about COVID-19 infection and its effects on heart disease and the level of knowledge about COVID-19 infection transmission precautions were found to be at a good level. In the study, the symptoms of COVID-19 infection were determined to be generally recognized by the participants; however, they were not aware of the symptoms such as itching, difficulty walking, hearing problems, and visual impairment. It was also found that most of the participants thought that gloves should be worn before touching any place. It seems that there are still questions about whether to wear gloves or not. It is suggested that the community should be better informed about this issue, and visual and written training programs should be created about the risks of wearing gloves.

It is important to increase the awareness of individuals about the COVID-19 infection that continues to affect the world and our country and cause serious losses. Chronic diseases and the high population of the elderly render severe symptoms and deaths. Determining the level of knowledge about the effect of COVID-19 infection, especially on cardiovascular diseases, and determining the deficiencies and subsequent interventions are important for individuals to recognize the symptoms of the disease in the early period, protect themselves and seek help. In this context, it is recommended to organize information programs for the community to understand its association with cardiac disease and COVID-19.

Study Limitations

Data collection was carried out online over the internet due to pandemic restrictions. For this reason, there was a problem in reaching sufficient data in the desired time.

DECLARATIONS

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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