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Determination of Ongoing Symptoms, Quality of Life Levels, and Risk Factors in Post-COVID-19 Patients

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ABSTRACT

Objective: Studies have reported that most post-COVID-19 patients experience post-disease symptoms, but the results of these studies have not been interpreted correctly. The present study aimed to determine the ongoing symptoms and quality of life levels in post-COVID-19 patients.

Materials and Methods: This cross-sectional research was carried out with 151 post-COVID-19 patients in Turkey. A sociodemographic data form and the general quality of life scale EQ-5D-5L were used.

Results: Most of the participants completed outpatient COVID-19 treatment (93.4%). Of the participants, 84.7% had at least one post-COVID-19 symptom and 41.7% had six or more symptoms. Fatigue (70.9%), joint pain (45.7%), and muscle pain (38.4%) were the most common post-COVID-19 symptoms. The longest-lasting post-COVID-19 symptoms were hair loss (104.2±51.5 days), memory problem (101.9±53.3 days), and depression (96.3±48.6 days). The mean of the visual analog scale was 83.9±16.1 and lower in individuals with six or more post-COVID-19 symptoms (p=0.001). In female participants, post-COVID-19 symptoms increased by 2.7 times (p=0.020). The prevalence of certain COVID-19 symptoms was significantly higher in females (loss of smell, hair loss, and heart palpitation), those aged 40 years and older (intermittent fever), and obese individuals (heart palpitation and intermittent fever).

Conclusion: Considering that post-COVID-19 symptoms can be seen in patients with mild illness at a high rate and for a long period of time, patient follow-up should be given importance especially for the females, elderly, and obese.

Keywords: Post-COVID-19, symptom assessment, quality of life, risk factors, patients

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INTRODUCTION

On March 11, 2020, the coronavirus disease 2019 (COVID-19) was identified as a pandemic by the World Health Organization. As of August 9, 2021, more than 202 million COVID-19 cases and 4.2 million deaths have been reported worldwide (1). In Turkey, the first COVID-19 case was recorded on March 11, and as of July 16, 2021, the total number of cases was 5,514,373, and the total number of deaths was 50,450 (2).

Post-COVID-19 syndrome is defined as the persistence of symptoms that developed during or after COVID-19 infection, lasting longer than 12 weeks, and cannot be explained by an alternative diagnosis (3). Studies have reported that 40%–90% of patients with COVID-19 experience post-disease symptoms, but the short-term nature of the studies on the subject and the lack of systematic implementation cause the results of the study not to be interpreted correctly (4–7).

Although post-COVID-19 symptoms are more common in people with severe disease, they can also be seen in people with mild infections (8). Indeed, there is also evidence that outpatients may complain of post-COVID-19 symptoms weeks after the onset of symptoms (9, 10). Whether sex, age, or underlying health conditions affect the risk of developing post-COVID-19 symptoms remains to be determined (11).

The aim of the study was to determine the ongoing symptoms, quality of life levels, and risk factors after the disease in COVID-19 patients.

MATERIALS AND METHODS

This cross-sectional research was carried out with post-COVID-19 individuals who applied to the internal diseases outpatient clinic of Sivas Cumhuriyet University Hospital between March 15 and April 15, 2021. According to Sivas Provincial Health Directorate data, 38,156 COVID-19 cases were recorded in the city center from the beginning of the pandemic until February 9, 2021. According to the latest data announced, the population of the Sivas city center is 382,520, and as of February 9, 2021, the rate of COVID-19 cases in the Sivas city center was calculated as 10%. When N=382,520, p=10%, confidence limits (d)=±0.05, confidence level=95%, the study

was found to include 139 individuals. In power analysis (G*Power 3.1.9.7 program) [Tails=two, Effect size=0.3, α err prob=0.05, Power (1–β err prob)=0.95], at least 134 individuals were to be included. Finally, 151 individuals agreed to participate in the study.

The inclusion criteria for participation in the study were having previously been diagnosed with COVID-19 using the polymerase chain reaction (PCR) test and at least 12 weeks have passed after the test result came back negative. The PCR test results of the participants were checked electronically (Ministry of Health e-Pulse Personal Health System). The exclusion criterion was being younger than 18 years.

The participants who agreed to participate in the study were informed of the procedure, and their written informed consent was obtained. Ethical approval was obtained from the Sivas Cumhuriyet University Medical Faculty Non-Invasive Ethics Committee before the study (Decision Number: 2021-03/03, date: 10.03.2021).

A sociodemographic data form and the general quality of life scale EQ-5D-5L (Euro Quality of Life-Five Dimension-Five Level) were used. All of these were administered to the participants.

The sociodemographic data form contained 11 questions on height, body weight, dates of diagnosis of and recovery from COVID-19, age, gender, marital status, occupation, smoking status, presence of chronic disease, treatment type of COVID-19, and post-COVID-19 symptoms. A checklist was created by scanning the literature for post-COVID-19 symptoms. Furthermore, the participants were asked about how long each symptom has persisted after the PCR test result was negative.

The EQ-5D-5L consists of two parts: the first part is the descriptive system and the second part is the visual analog scale (VAS). The first part is related to the participants' health profile of that day, which is defined in five sub-dimensions: mobility, self-care, usual activities, pain/ discomfort, and anxiety/ depression. Answers were given for each section, using five options: "no problem," "mild problem," "moderate problem," "severe problem," and "excessive problem." Each section of the sub-dimensions in the first part of the scale was analyzed separately for each independent variable and the number of post-COVID-19 symptoms. In addition, a score calculation was not made. In the VAS section, which consists of six questions, participants scored their current health between 0 and 100. As the score increases, the perception of health increases positively. The Turkish version of the scale, which was translated into 171 languages by the EuroQol group, was used. The Cronbach alpha value was calculated above 0.80 (12).

Statistical Analysis

Data were analyzed using the SPSS 22.0 program. Descriptive statistics such as mean, standard deviation, and percentage distribution were given. The normality of the data was measured using the Kolmogorov–Smirnov test. The independent sample t test, the Mann–Whitney U test, the Kruskal–Wallis test (post hoc Mann–Whitney U), the chi-square test, Fisher's exact test, and binary logistic regression analysis were used. To determine the relationship of some characteristics of the participants with the increasing number of post-COVID-19 symptoms (≥6 symptoms), the following data were included: gender, occupation, smoking, presence of chronic disease [diabetes mellitus (DM), hypertension (HT), and cardiovascular disease (CVD)], COVID-19 treatment type, the duration after recovery from COVID-19, and EuroQol VAS score. A p-value of <0.05 was considered significant.

Table 1. The distribution of the participants' sociodemographic and COVID-19-related characteristics (n=151).

Characteristics	
Age (Mean±SD)	37.4±11.2
Gender (n, %)	
Male	68 (45.0)
Female	83 (55.0)
Marital status (n, %)	
Single + widow	47 (31.1)
Married	104 (68.9)
Occupation (n, %)	
Healthcare workers	84 (55.6)
Non-healthcare workers	67 (44.4)
BMI (Mean±SD)	26.2±4.6
Underweight/normal weight (n, %)	66 (43.7)
Overweight (n, %)	57 (37.7)
Obese (n, %)	28 (18.5)
Smoking (n, %)	
No	114 (75.5)
Yes	37 (24.5)
Chronic disease (n, %)	
No	119 (78.8)
At least one	32 (21.2)
HT (yes)	15 (9.9)
DM (yes)	12 (7.9)
CVD (yes)	7 (4.6)
COVID-19 treatment	
Outpatient treatment	141 (93.4)
Inpatient treatment	10 (6.6)
Duration after recovery from COVID-19 (month)	
Mean±SD	4.2±1.8; Min=3, Max=13

BMI: Body mass index; DM: Diabetes mellitus; HT: Hypertension; CVD: Cardiovascular disease; SD: Standard deviation; [1]Fisher's exact test

RESULTS

The distribution of the participants' sociodemographic and COVID-19-related characteristics is given in Table 1. Most of the participants were female, married, normal weight, and nonsmokers and did not have any chronic disease. The most common chronic disease was HT (9.9%), followed by DM (7.9%) and CVD (4.6%). Most of the individuals who survived COVID-19 in our study were healthcare workers [physicians (n=47, 56.0%) and nurses (n=37, 44.0%)]. Most of the participants completed outpatient COVID-19 treatment (93.4%), and their mean duration after recovery from COVID-19 was 4.2±1.8 months.

Table 2. The distribution of the participants' post-COVID-19 symptoms and the duration of symptoms (n=151)

Post- COVID symptoms (n,%)	Total	Duration of symptoms (Mean±SD) (days)	Age (<40) (n=90, 59.6%)	Age (≥40) (n=61, 40.4%)	Female (n=83, 55.0%)	Male (n=68, 45.0%)	Underweight/normal weight (66, 43.7%)	Overweight (57, 37.7%)	Obese (28, 18.5%)
Number of symptoms (Mean±SD)	5.0±3.9		5.0±3.9	5.1±3.9	5.9±3.9	4.0±3.7	5.2±4.0	4.3±3.8	6.0±3.8
			U=2782.0 p=0.888		U=2046.5 p=**0.004**		KW=4.305 p=0.116		
No symptom	23 (15.2)		16 (17.8)	7 (11.5)	10 (12.0)	13 (19.1)	11 (16.7)	10 (17.5)	2 (7.1)
1–5 symptoms	65 (43.0)		35 (38.9)	30 (49.2)	32 (38.6)	33 (48.5)	26 (39.4)	27 (47.4)	12 (42.9)
≥6 symptoms	63 (41.7)		39 (43.3)	24 (39.3)	41 (49.4)	22 (32.4)	29 (43.9)	20 (35.1)	14 (50.0)
Fatigue (yes)	107 (70.9)	64.8±54.8	67 (74.4)	40 (65.6)	61 (73.5)	46 (67.6)	45 (68.2)	40 (70.2)	22 (78.6)
		Min: 2, Max: 190	x^2=0.989 p=0.320		x^2=0.368 p=0.544		x^2=1.049 p=0.592		
Joint pain (yes)	69 (45.7)	54.8±53.5	40 (44.4)	29 (47.5)	42 (50.6)	27 (39.7)	29 (43.9)	24 (42.1)	16 (57.1)
		Min: 2, Max: 180	x^2=0.140 p=0.708		x^2=1.788 p=0.181		x^2=1.857 p=0.395		
Muscle pain (yes)	58 (38.4)	67.3±58.1	31 (34.4)	27 (44.3)	32 (38.6)	26 (38.2)	21 (31.8)	23 (40.4)	14 (50.0)
		Min: 2, Max: 180	x^2=1.095 p=0.295		x^2=0.002 p=0.968		x^2=2.893 p=0.235		
Breathlessness (yes)	53 (35.1)	60.2±49.5	32 (35.6)	21 (34.4)	35 (42.2)	18 (26.5)	24 (36.4)	18 (31.6)	11 (39.3)
		Min: 3, Max: 180	x^2=0.020 p=0.887		x^2=3.384 p=0.066		x^2=0.572 p=0.751		
Headache (yes)	48 (31.8)	50.9±50.5	28 (31.1)	20 (32.8)	30 (36.1)	18 (26.5)	20 (30.3)	15 (26.3)	13 (46.4)
		Min: 1, Max: 180	x^2=0.002 p=0.969		x^2=1.198 p=0.274		x^2=3.622 p=0.163		
Difficulty in concentrating (yes)	45 (29.8)	76.9±57.1	32 (35.6)	13 (21.3)	26 (31.3)	19 (27.9)	22 (33.3)	15 (26.3)	8 (28.6)
		Min: 5, Max: 180	x^2=2.878 p=0.090		x^2=0.075 p=0.784		x^2=0.745 p=0.689		
Cough (yes)	44 (29.1)	37.6±39.7	26 (28.9)	18 (29.5)	27 (32.5)	17 (25.0)	21 (31.8)	12 (21.1)	11 (39.3)
		Min: 3, Max: 180	x^2=0.007 p=0.935		x^2=0.694 p=0.405		x^2=3.431 p=0.180		
Loss of smell (yes)	44 (29.1)	47.3±49.5	25 (27.8)	19 (31.1)	31 (37.3)	13 (19.1)	20 (30.3)	17 (29.8)	7 (25.0)
		Min: 2, Max: 180	x^2=0.070 p=0.791		x^2=5.166 p=**0.023**		x^2=0.289 p=0.866		
Hair loss (yes)	42 (27.8)	104.2±51.5	22 (24.4)	20 (32.8)	35 (42.2)	7 (10.3)	19 (28.8)	13 (22.8)	10 (35.7)
		Min: 5, Max: 190	x^2=0.879 p=0.348		x^2=17.359 p=**0.001**		x^2=1.613 p=0.446		
Sleeping disorder (yes)	42 (27.8)	88.9±54.4	22 (24.4)	20 (32.8)	26 (31.3)	16 (23.5)	18 (27.3)	17 (29.8)	7 (25.0)
		Min: 7, Max: 180	x^2=0.879 p=0.348		x^2=0.776 p=0.378		x^2=0.236 p=0.889		
Heart palpitation (yes)	40 (26.5)	69.9±55.9	21 (23.3)	19 (31.1)	28 (33.7)	12 (17.6)	20 (30.3)	8 (14.0)	12 (42.9)
		Min: 2, Max: 180	x^2=0.774 p=0.379		x^2=4.176 p=**0.041**		x^2=8.885 p=**0.012**		
Loss of taste (yes)	36 (23.8)	34.3±43.3	23 (25.6)	13 (21.3)	22 (26.5)	14 (20.6)	17 (25.8)	13 (22.8)	6 (21.4)
		Min: 2, Max: 180	x^2=0.165 p=0.685		x^2=0.432 p=0.511		x^2=0.257 p=0.879		
Memory problem (yes)	36 (23.8)	101.9±53.3	22 (24.4)	14 (23.0)	25 (30.1)	11 (16.2)	18 (27.3)	8 (14.0)	10 (35.7)
		Min: 7, Max: 190	x^2=0.045 p=0.833		x^2=3.271 p=0.070		x^2=5.621 p=0.060		
Anxiety (yes)	34 (22.5)	89.0±50.2	23 (25.6)	11 (18.0)	24 (28.9)	10 (14.7)	20 (30.3)	10 (17.5)	4 (14.3)
		Min: 15, Max: 190	x^2=0.788 p=0.375		x^2=3.550 p=0.060		x^2=4.189 p=0.123		
Chest pain (yes)	27 (17.9)	62.6±56.8	14 (15.6)	13 (21.3)	17 (20.5)	10 (14.7)	12 (18.2)	7 (12.3)	8 (28.6)
		Min: 3, Max: 180	x^2=0.475 p=0.491		x^2=0.501 p=0.479		x^2=3.401 p=0.183		
Depression (yes)	19 (12.6)	96.3±48.6	14 (15.6)	5 (8.2)	13 (15.7)	6 (8.8)	13 (19.7)	4 (7.0)	2 (7.1)
		Min: 30, Max: 180	x^2=1.183 p=0.277		x^2=1.028 p=0.311		x^2=5.395 p=0.067		
Intermittent fever (yes)	16 (10.6)	33.6±42.8	5 (5.6)	11 (18.0)	9 (10.8)	7 (10.3)	4 (6.1)	4 (7.0)	8 (28.6)
		Min: 2, Max: 150	x^2=4.730 p=**0.030**		x^2=0.012 p=0.913		x^2=11.754 p=**0.003**		

SD: Standard deviation; Min: Minimum; Max: Maximum; U: Mann–Whitney U test

Table 2 shows the distribution of the participants' post-COVID-19 symptoms. Participants' mean number of post-COVID-19 symptoms was 5.0±3.9, and there was no difference in the age (p=0.888) and BMI (p=0.116) categories. However, the mean number of symptoms for female was higher than that of male (p=0.004). Of the participants, 84.7% had at least one post-COVID-19 symptom and 41.7% had six and more symptoms. Fatigue (70.9%), joint pain (45.7%), muscle pain (38.4%), breathlessness (35.1%), and headache (31.8%) were the most common post-COVID-19 symptoms. The longest-lasting post-COVID-19 symptoms were hair loss (104.2±51.5 days), memory problem (101.9±53.3 days), and depression (96.3±48.6 days). The shortest-lasting post-COVID-19 symptoms were intermittent fever (33.6±42.8 days), loss of taste (34.3±43.3 days), and cough (37.6±39.7 days). The prevalence of loss of smell (p=0.023) and hair loss (p=0.001) was higher in female participants, the prevalence of heart palpitation was higher in female (p=0.041) and obese (p=0.012) participants, and the prevalence of intermittent fever was higher in those aged 40 and older (p=0.030) and those who are obese (p=0.003).

The distribution of the participants' EQ-5D-5L results is given in Table 3. The proportion of participants who did not have any problems was higher for all dimensions of EQ-5D-5L. The mean of the EuroQol VAS was 83.9±16.1, and it was lower in female than in male participants (p=0.012). There was no difference in the incidence of EQ-5D-5L dimensions in the BMI categories (p>0.05). The proportion of those experiencing any problems was higher in female participants at the mobility (p=0.048) and pain/discomfort (p=0.013) dimensions, and it was higher in those aged 40 and older at the self-care (p=0.010) and usual activities (p=0.013) dimensions.

Table 4 shows the distribution of the participants' EQ-5D-5L results according to the number of post-COVID-19 symptoms. The proportion of those experiencing any problems was higher in individuals with six or more post-COVID-19 symptoms at the mobility (p=0.012), usual activities (p=0.023), pain/discomfort (p=0.001), and anxiety/depression (p=0.002) sub-dimensions of the quality of life scale. The mean of the EuroQol VAS was also lower in individuals with six or more post-COVID-19 symptoms than in those who had no symptoms (p=0.002).

Table 5 presents the relationship of some characteristics of the participants with the increasing number of post-COVID-19 symptoms (≥6 symptoms). In female participants, post-COVID-19 symptoms increased by 2.7 times (p=0.020). An increased level of quality of life (OR=0.97, 95% CI= 0.95–0.99, p=0.013) associated with the low number of post-COVID-19 symptoms.

DISCUSSION

While 40% of patients with COVID-19 have no symptoms, about 80% of those with symptoms report mild illness and can be treated as an outpatient (13). Approximately 15% have a disease that will require hospitalization, and only 5% need follow-up in the intensive care unit (ICU) due to respiratory failure (13). It is reported that there are patients with post-COVID-19 symptoms despite recovery from the disease (14). Here in our study, we aimed to determine the persistence rate of symptoms in people recovering from COVID-19, which symptoms persist for how long, the factors that affect them, and how this affects the quality of people's life.

The fact that the vast majority of the people (93.4%) who agreed to participate in our study consisted of cases that did not require hospitalization during COVID-19 is important in terms of revealing the rate of occurrence of ongoing symptoms in these people. It has been reported that symptoms may occur weeks after being infected with the virus and may occur to anyone with the disease, even if they have no symptoms (15). Indeed, Townsend et al. (8) assessed the findings of 153 individuals (48% required hospitalization) after a median of 75 days after the diagnosis of COVID-19 and found that none of the measurements of persistent respiratory disease were associated with initial disease severity.

Symptoms that occur after COVID-19 can generally be listed as fatigue, difficulty in concentrating, headache, loss of smell or taste, dizziness while standing, heart palpitations, chest pain, difficulty in breathing or shortness of breath, cough, joint or muscle pain, depression or anxiety, and fever (15). Similar to our research, a study found that 80% of patients with COVID-19 developed one or more post-COVID-19 symptoms (16). In the same research, the most common symptoms were reported as fatigue (58%), headache (44%), attention deficit (27%), hair loss (25%), and shortness of breath (24%) (16). In a study evaluating symptoms in 143 patients after COVID-19 in Italy, similar to our study, at least one symptom was found in 87.4% of the participants, and the most detected post-COVID-19 symptoms were fatigue (53.1%), dyspnea (43.4%), joint pain (27.3%), and chest pain (21.7%) (6). In another study, it was detected that fatigue (87%) and dyspnea (71%) were the most seen symptoms 3 months after COVID-19 (17). In a study evaluating post discharge symptoms seen in people recovering from COVID-19, fatigue (72% in ICU, 60.3% in ward), breathlessness (65.6% in ICU, 42.6% in ward) and psychological distress (46.9% in ICU, 23.5% in ward) were the most seen symptoms (5). The results of all these studies in the literature showed that post-COVID-19 symptoms did not differ significantly in outpatients, inpatients, or inpatients in ICU, and the most seen symptoms in general were fatigue, breath shortness, and joint pain.

In our study, the post-COVID-19 symptoms' durations of the participants were also examined, and it was determined that the symptoms with the longest duration were hair loss, memory problem, and depression. Symptoms with the shortest duration were intermittent fever, difficulty in tasting, and cough. However, in many studies evaluating post-COVID-19 symptoms, the duration of symptoms was not questioned, since most of these studies were generally conducted after a short follow-up period after discharge from the hospital. Our current study is important in terms of evaluating the ongoing symptoms and durations of post-COVID-19 in people for a long time, that is, a maximum of 13 months after recovery from COVID-19. Carfì et al. (6) stated in their study that the mean duration of days after discharge from COVID-19 was 36.1±12.9 and the days' mean duration since the beginning of symptoms was 60.3±13.6, but they did not report how much this duration was for each symptom.

Our study also revealed the prevalence of post-COVID-19 symptoms in detail according to age, gender, BMI, and health worker status. We found that the prevalence of certain symptoms was significantly higher in females (loss of smell, hair loss, and heart

Table 3. The distribution of the participants' quality of life scale (EQ-5D-5L) results

EQ-5D-5L dimensions (n, %)	**Total (n=151, 100.0%)**	**Age (<40) (n=90, 59.6%)**	**Age (≥40) (n=61, 40.4%)**	**Female (n=83, 55.0%)**	**Male (n=68, 45.0%)**	**Underweight/normal weight (n=66, 43.7%)**	**Overweight (n=57, 37.7%)**	**Obese (n=28, 18.5%)**
Mobility								
I am unable to walk about	2 (1.3)	1 (1.1)	1 (1.6)	0 (0.0)	2 (2.9)	0 (0.0)	1 (1.8)	1 (3.6)
I have severe problems in walking about	2 (1.3)	1 (1.1)	1 (1.6)	0 (0.0)	2(2.9)	0 (0.0)	2 (3.5)	0 (0.0)
I have moderate problems in walking about	17 (11.3)	7 (7.8)	10 (16.4)	11 (13.3)	6 (8.8)	7 (10.6)	7 (12.3)	3 (10.7)
I have slight problems in walking about	19 (12.6)	12 (13.3)	7 (11.5)	14 (16.9)	5 (7.4)	11 (16.7)	4 (7.0)	4 (14.3)
I have no problems in walking about	111 (73.5)	69 (76.7)	42 (68.9)	58 (69.9)	53 (77.9)	48 (75.4)	43 (75.4)	20 (71.4)
		x^2=2.952 p=0.636		x^2=8.553 p=**0.048**			x^2=7.798 p=0.453	
Self-care[1]								
I have moderate problems washing or dressing myself	3 (2.0)	0 (0.0)	3 (4.9)	1 (1.2)	2 (2.9)	1 (1.5)	2 (3.5)	0 (0.0)
I have slight problems washing or dressing myself	5 (3.3)	1 (1.1)	4 (6.6)	3 (3.6)	2 (2.9)	1 (1.5)	2 (3.5)	2 (7.1)
I have no problems washing or dressing myself	143 (94.7)	89 (98.9)	54 (88.5)	79 (95.2)	64 (94.1)	64 (97.0)	53 (93.0)	26 (92.9)
		x^2=8.095 p=**0.010**		x^2=0.623 p=0.860			x^2=3.250 p=0.508	
Usual activities[2]								
I have moderate problems doing my usual activities	11 (7.3)	2 (2.2)	9 (14.8)	7 (8.4)	4 (5.9)	3 (4.5)	5 (8.8)	3 (10.7)
I have slight problems doing my usual activities	16 (10.6)	11 (12.2)	5 (8.2)	12 (14.5)	4 (5.9)	10 (15.2)	3 (5.3)	3 (10.7)
I have no problems doing my usual activities	124 (82.1)	77 (85.6)	47 (77.0)	64 (77.1)	60 (88.2)	53 (80.3)	49 (86.0)	22 (78.6)
		x^2=8.715 p=**0.013**		x^2=3.492 p=0.175			x^2=4.300 p=0.371	
Pain/discomfort[3]								
I have moderate pain or discomfort	17 (11.3)	9 (10.0)	8 (13.1)	13 (15.7)	4 (5.9)	8 (12.1)	6 (10.5)	3 (10.7)
I have slight pain or discomfort	42 (27.8)	25 (27.8)	17 (27.9)	28 (33.7)	14 (20.6)	21 (31.8)	10 (17.5)	11 (39.3)
I have no pain or discomfort	92 (60.9)	56 (62.2)	36 (59.0)	42 (50.6)	50 (73.5)	37 (56.1)	41 (71.9)	14 (50.0)
		x^2=0.375 p=0.829		x^2=8.723 p=0.013			x^2=5.883 p=0.208	
Anxiety/depression								
I am extremely anxious or depressed	1 (0.7)	1 (1.1)	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)	1 (1.8)	0 (0.0)
I am severely anxious or depressed	3 (2.0)	1 (1.1)	2 (3.3)	2 (2.4)	1 (1.5)	1 (1.5)	2 (3.5)	0 (0.0)
I am moderately anxious or depressed	20 (13.2)	13 (14.4)	7 (11.5)	12 (14.5)	8 (11.8)	9 (13.6)	8 (14.0)	3 (10.7)
I am slightly anxious or depressed	34 (22.5)	21 (23.3)	13 (21.3)	22 (26.5)	12 (17.6)	17 (25.8)	12 (21.1)	5 (17.9)
I am not anxious or depressed	93 (61.6)	54 (60.0)	39 (63.9)	46 (55.4)	47 (69.1)	39 (59.1)	34 (59.6)	20 (71.4)
		x^2=1.937 p=0.820		x^2=3.631 p=0.483			x^2=4.288 p=0.877	
EuroQol visual analog scale (Mean±SD)	83.9±16.1	82.8±18.3	86.1±11.9	80.8±18.3	88.2±11.7	82.6±17.4	84.5±14.3	86.9±16.5
		U=2852.0 p=0.681		U=3489.0 p=**0.012**			KW=2.065 p=0.356	

SD standard deviation; U: Mann–Whitney U test; KW: Kruskal–Wallis test; [1]I am unable to wash or dress myself (n=0), I have severe problems washing or dressing myself (n=0); [2]I am unable to do my usual activities (n=0), I have severe problems doing my usual activities (n=0); [3]I have extreme pain or discomfort (n=0), I have severe pain or discomfort (n=0)

Table 4. The distribution of the participants' quality of life scale (EQ-5D-5L) results according to the number of post-COVID-19 symptoms (n=151)

EQ-5D-5L dimensions (n, %)	No symptom (n=23, 15.2%)	1–5 symptoms (n=65, 43.0%)	≥6 symptoms (n=63, 41.7%)
Mobility			
I am unable to walk about	0 (0.0)	1 (1.5)	1 (1.6)
I have severe problems in walking about	0 (0.0)	0 (0.0)	2 (3.2)
I have moderate problems in walking about	0 (0.0)	4 (6.2)	13 (20.6)
I have slight problems in walking about	0 (0.0)	10 (15.4)	9 (14.3)
I have no problems in walking about	23 (100.0)	50 (76.9)	38 (60.3)
		x^2=19.402 p=**0.012**	
Self-care			
I am unable to wash or dress myself	0 (0.0)	0 (0.0)	0 (0.0)
I have severe problems washing or dressing myself	0 (0.0)	0 (0.0)	0 (0.0)
I have moderate problems washing or dressing myself	0 (0.0)	1 (1.5)	2 (3.2)
I have slight problems washing or dressing myself	0 (0.0)	2 (3.1)	3 (4.8)
I have no problems washing or dressing myself	23 (100.0)	62 (95.4)	58 (92.1)
		x^2=2.261 p=0.637	
Usual activities			
I am unable to do my usual activities	0 (0.0)	0 (0.0)	0 (0.0)
I have severe problems doing my usual activities	0 (0.0)	0 (0.0)	0 (0.0)
I have moderate problems doing my usual activities	1 (4.3)	2 (3.1)	8 (12.7)
I have slight problems doing my usual activities	1 (4.3)	4 (6.2)	11 (17.5)
I have no problems doing my usual activities	21 (91.3)	59 (90.8)	44 (69.8)
		x^2=11.231 p=0.023	
Pain/discomfort			
I have extreme pain or discomfort	0 (0.0)	0 (0.0)	0 (0.0)
I have severe pain or discomfort	0 (0.0)	0 (0.0)	0 (0.0)
I have moderate pain or discomfort	0 (0.0)	4 (6.2)	13 (20.6)
I have slight pain or discomfort	2 (8.7)	19 (29.2)	21 (33.3)
I have no pain or discomfort	21 (91.3)	42 (64.6)	29 (46.0)
		x^2=18.696 p=**0.001**	
Anxiety/depression			
I am extremely anxious or depressed	0 (0.0)	0 (0.0)	1 (1.6)
I am severely anxious or depressed	0 (0.0)	1 (1.5)	2 (3.2)
I am moderately anxious or depressed	1 (4.3)	3 (4.6)	16 (25.4)
I am slightly anxious or depressed	5 (21.7)	11 (16.9)	18 (28.6)
I am not anxious or depressed	17 (73.9)	50 (76.9)	26 (41.3)
		x^2=23.627 p=**0.002**	
EuroQol visual analog scale (Mean±SD)	92.2±8.3	86.1±14.0	79.1±18.6
		KW=13.455 p=**0.001**[1]	

KW: Kruskal–Wallis test; U: Mann–Whitney U test; SD: Standard deviation; [1]Significant difference = ≥6 symptoms; No symptom U = 36.478 p=**0.002**

palpitation), those aged 40 years and older (intermittent fever), and obese individuals (heart palpitation and intermittent fever). We could not find a study in the literature examining the distribution of post-COVID-19 symptoms according to sociodemographic characteristics of individuals. These features have been partially investigated only in studies on post-COVID-19 fatigue. Townsend et al. (18) found that females and those with a previous depression or anxiety diagnoses had more fatigue. As a matter of fact, in a meta-analysis study in which the COVID-19 long-term effects were evaluated, it was emphasized that future studies should be stratified according to gender, age, comorbidities, severity of the disease, and duration of each symptom (16).

Table 5. The relationship of some characteristics of the participants with the increasing number of post-COVID-19 symptoms (≥6 symptoms)[1] (n=151)

Category	OR_c (95% CI)	p	OR_a (95% CI)	p
Gender				
Male	1.00		1.00	
Female	2.04 (1.05–3.97)	**0.036**	2.65 (1.17–6.00)	**0.020**
Occupation				
Non–HCW	1.00		1.00	
HCW	0.72 (0.37–1.37)	0.312	0.72 (0.34–1.52)	0.391
Smoking				
No	1.00		1.00	
Yes	1.26 (0.60–2.65)	0.549	2.05 (0.83–5.06)	0.120
Chronic disease				
No	1.00		1.00	
At least one	2.11 (0.96–4.66)	0.063	3.12 (0.72–13.62)	0.130
Diabetes mellitus				
No	1.00		1.00	
Yes	2.08 (0.63–6.87)	0.232	1.44 (0.28–7.49)	0.668
Hypertension				
No	1.00		1.00	
Yes	0.92 (0.31–2.74)	0.887	0.20 (0.04–1.07)	0.059
Cardiovascular disease				
No	1.00		1.00	
Yes	1.92 (0.42–8.90)	0.404	2.54 (0.35–18.61)	0.360
COVID-19 treatment				
Outpatient treatment	1.00		1.00	
Inpatient treatment	2.21 (0.60–8.19)	0.235	3.40 (0.80–14.43)	0.098
Duration after recovery from COVID-19	1.07 (0.89–1.28)	0.470	1.14 (0.94–1.39)	0.187
EuroQol visual analog scale score	0.96 (0.94–0.99)	**0.002**	0.97 (0.95–0.99)	**0.013**

OR_c: Crude odds ratio; OR_a: Adjusted odds ratio; CI: Confidence interval; HCW: Healthcare workers; Reference category; 1=0–5 symptoms

In many studies on post-COVID-19 symptoms, participants' quality of life has also been examined. In a cohort study conducted by Moreno-Perez et al. (19), similar to our research, the post-COVID infection VAS median value of the participants was found to be 83.0 (70–90) . In the same research, the researchers stated that post-acute COVID-19 syndrome caused impairment in the quality of life of two-thirds of the participants (19). In another study, it was stated that the worsened quality of life level of individuals after acute COVID-19 was 44.1% (6). In their study evaluating COVID-19 post discharge symptoms, Halpin et al. (5) found no difference in age and BMI between those who observed problems with mobility, self-care, or usual activities and those who did not. For both groups, more than half of ICU and ward patients showing new problems with mobility, self-care, or usual activities reported new or worsened shortness of breath and new fatigue (5). On the other hand, in our study, there were negatively significant differences in parameters related to the quality of life in females, in those aged 40 and older, and in those who had six or more symptoms. This difference may be due to the fact that most of the participants in our study were those who had outpatient treatment. Garrigues et al. (20), in their study, found that the mean VAS was 70.3%, and they did not find any difference between ICU and ward participants.

In our study, being a female was the only significant factor increasing the number of symptoms. Our other results, discussed above, also supported this situation. It is an expected result that there was a negative relationship between the increasing quality of life level and the increasing number of symptoms.

Since most of the studies conducted on the subject had only compared the symptoms and quality of life levels in these two groups in patients who were hospitalized in the ward or ICU and discharged from the hospital, we could not find the opportunity to compare the findings we found in our study sufficiently.

The limitations of our study include the following: not knowing the detailed symptoms of patients before COVID-19, not evaluating the severity of the symptoms we detected, and the small number of participants who received inpatient treatment.

CONCLUSION

Our study is important in terms of evaluating the ongoing symptoms after the illness, including the duration of symptoms, especially in terms of some sociodemographic characteristics of the participants, most of whom have completed their outpatient COVID-19 treatment. Considering that post-COVID-19 symptoms can be seen in patients with mild illness at a high rate and for a long period of time, patient follow-up should be given importance especially for females and the elderly. Weight control can be recommended to these patients as a modifiable risk factor.

Ethics Committee Approval: The Sivas Cumhuriyet University Medical Faculty Non-Invasive Ethics Committee granted approval for this study (date: 10.03.2021, number: 2021-03/03).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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Author Contributions: Concept – İA; Design – İA; Supervision – İA, MAG; Resource – İA, MAG; Materials – MAG; Data Collection and/or Processing – MAG; Analysis and/or Interpretation – İA; Literature Search – İA, MAG; Writing – İA, MAG; Critical Reviews – İA, MAG.

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