

## The duration of symptoms relief after treatment in symptomatic COVID-19 cases

*Semptomatik COVID-19 vakalarında tedavi sonrası semptomların gerileme süresi*

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### Abstract

**Purpose:** The clinical profile of coronavirus disease (COVID-19) has a wide range of symptoms from self-limiting viral upper respiratory tract infection to death from arrest. The symptoms vary depending on the severity of the disease and countries. Experts from many parts of the world report on symptoms and onset times, but there are still many unanswered questions about the new disease, COVID-19. The prevalence of symptoms and, in particular, the relief durations are also questions that need to be answered. Moreover, there is no common algorithm for post-treatment follow-up in this disease, which can cause many organ damage.

**Materials and methods:** The aim of this cross-sectional survey study is to find answers to these questions. A total of 185 symptomatic people, who were discharged after inpatient treatment in Elazığ Fethi Sekin City Hospital in Turkey in December 2020, voluntarily participated in the study. Volunteers were asked questions about the duration of relief of symptoms after treatment. Each of the common symptoms was examined separately (16 questions). The data obtained were statistically analyzed using Microsoft Excel and SPSS program; and charted by using the Python 3.0 Seaborn library.

**Results:** According to the answers of the participants, it was concluded that the symptoms could persist for more than 1 month and therefore they repeatedly applied to the hospital.

**Conclusion:** The uncertainty about the symptoms and duration of COVID-19 after treatment imposes serious financial burdens on health organizations. Due to this reason, it is urgently necessary to conduct large-scale randomized studies and determine follow-up algorithms after treatment.

**Key words:** COVID-19, SARS COV-2, symptom, pandemic, follow-up algorithm.

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### Öz

**Amaç:** Koronavirüs hastalığının (COVID-19) klinik profili; kendi kendini sınırlayan viral üst solunum yolu enfeksiyonu semptomlarından başlayıp, akut şiddetli solunum sıkıntısı (ARDS) ve akut kardiyopulmoner arrest nedenli ölüme kadar değişen geniş bir aralığa sahiptir. Semptomlar hastalığın şiddetine ve ülkelere göre çeşitlilik göstermektedir. Semptomlar ve başlangıç zamanları ile ilgili dünyanın birçok yerinden uzmanlar bildirimde bulunmaktadır. Fakat yeni bir hastalık olan COVID-19 ile ilgili hala cevaplanmamış birçok soru vardır. Semptomların yaygınlığı ve özellikle sonlanım zamanları da cevaplanması gereken sorulardandır. Ayrıca birçok organ hasarı ile gidebilen bu hastalıkta tedavi sonrası izlem ile ilgili ortak bir algoritma yoktur.

**Gereç ve yöntem:** Kesitsel anket çalışmamızın amacı bu sorulara cevap bulmaya yöneliktir. Anketimize Aralık 2020'de kliniğimizde yatarak tedavi gördükten sonra taburcu edilmiş semptomatik olan toplam 185 kişi gönüllü olarak katılmıştır. Gönüllülere Semptomların tedavi sonrası sonlanım zamanları ile ilgili sorular soruldu. Yaygın görülen semptomlardan her biri ayrı ayrı maddeler halinde incelendi (16 soru). Elde edilen veriler istatistiksel olarak Microsoft Excell ve SPSS programı kullanılarak analiz edildi. Python 3.0 seaborn kütüphanesi kullanılarak grafiğe döküldü.

**Bulgular:** Katılımcıların verdiği cevaplara göre semptomların 1 aydan daha uzun süre devam edebildiği ve bu nedenle tekrar tekrar hastaneye başvurduğu görüldü.

**Sonuç:** Tedavi sonrası COVID-19 semptomları ve süreleriyle ilgili bilinmezlik sağlık kuruluşlarına ciddi mali yükler getirmektedir. Bu açıdan acilen geniş çaplı randomize çalışmalar yapılması, tedavi sonrası izlem algoritmaları belirlenmesi gerekmektedir.

**Anahtar kelimeler:** COVID-19, SARS-CoV-2, semptom, pandemi, takip algoritması.

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## Introduction

Coronaviruses are a large family of viruses that infect the respiratory tract in humans [1]. COVID-19 is the last identified member of this family. Coronaviruses (CoV) are the viruses that can cause self-limiting mild infection tables such as the common cold or more serious infection tables, such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) [2]. In Wuhan, China, cases with pneumonia of unknown etiology began to be reported as of December 31, 2019,

The (2019-nCoV) from coronavirus family that had not previously been detected in humans was defined as the causative virus for the existing cases [3]. Later name of 2019-nCoV disease was adopted as COVID-19 and also named SARS-CoV-2 due to the virus' close similarity to SARS CoV [4]. The COVID-19 outbreak began in China and affected the entire world. Considering the number of infections worldwide and the mortality rate associated with it, The COVID-19 outbreak has now been declared a pandemic by the World Health Organization [5]. 83.143.254 patients infected with COVID-19 and 1,813,583 deaths had been reported worldwide as of 31.12.2020 [6].

The disease is mainly transmitted by droplets. Also, it is transmitted by touching the droplets emitted by an infected person through coughing and sneezing by other people and then touching the mouth, nose or eye mucosa. Since viruses can be detected in respiratory tract secretions of asymptomatic people, these people may be contagious. When the epidemiological characteristics of the cases in China were examined, it was observed that the average incubation period was 5-6 days (2-14 days), in some cases it could extend up to 14 days [7].

In addition to respiratory symptoms, fever, cough, dyspnea, which are common symptoms of infection, new symptoms such as loss of sense of smell and taste, diarrhea may be seen. Although the infection recovers, some people may continue to cough or have a loss or change in taste or sense of smell for several weeks. In more serious cases, pneumonia, severe acute respiratory infection, kidney failure and even

death may develop. While the mortality rate was 11% in the SARS outbreak and 35-50% in MERS-CoV, the mortality rate of COVID-19 was reported as 3.2% [2].

Studies so far have mostly focused on the initial symptoms of the disease. The aim of this study is to investigate how long COVID-19 symptoms persist after treatment and examine the need to create a follow-up algorithm for these symptoms.

## Material and methods

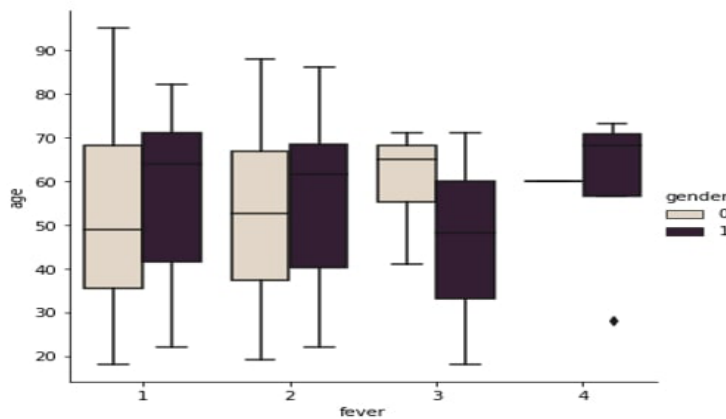
This cross-sectional study was conducted with the patients diagnosed with COVID-19 who received inpatient treatment in December 2020 at the pandemic service of Elazig Fethi Sekin City Hospital in Turkey. The ethical approval was obtained with the decision No: 2021/01-31 of the Ethics Committee of Firat University and the decision No:2021-01-13T12\_58\_32 of the Ministry of Health. Especially, the patients with multiple symptoms were identified. The patients were reached by phone and face-to-face interviews were provided. It took 20-25 minutes for each person to complete the form. The demographics of the people were recorded. With the questionnaire arranged with the known COVID-19 symptoms, elective questions were asked about how long these symptoms persisted after treatment.

Each of the common symptoms was examined separately (16 questions). As the last question, the participants were asked if there were any symptoms that were not included in the questionnaire, which they thought developed after COVID-19 treatment. Also, they were also asked to state in writing whether they had been applied to the hospital for this reason. The most frequently given answer was included in the survey items (17. question). The symptom persistence duration in the survey questions were determined by taking into account the symptoms onset time and the average duration of treatment. To provide the reliability of the answers, the illiterate patients, patients with communication problems and patients diagnosed with dementia were not included in the study. The data obtained were statistically analyzed using Microsoft Excel and SPSS program; and charted by using the Python 3.0 Seaborn library.

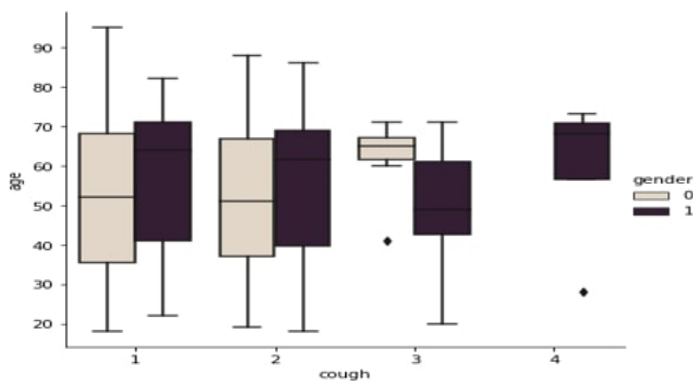
**Results**

The study was conducted with a total of 185 volunteer participants, and 117 of them were male (63%) and 68 (37%) were female. The average age of the patients was  $55 \pm 18.3$  (female:  $52.7 \pm 18.5$ , male:  $56.3 \pm 17.5$ ). Overall treatment durations were mostly between 7-10 days for both sexes (51.4%). All participants had a fever higher than  $38^{\circ}\text{C}$ , and commonly it was persistent for the first 5 days (Figure 1). Similarly, in both sexes sore throat and cough mostly ended in the first 7 days. Symptoms of prolonged cough and sore throat were more common in men (Figure 2). The complaint of fatigue ended within 20 days after treatment, and no significant gender discrimination was observed. The complaint of prolonged fatigue that continued for more than 30 days was remarkably with a rate of 16.8%. Shortness of breath showed improvement in the 20-day period after treatment with a very high rate and rarely continued for a period exceeding 1 month (2.7%).

The vast majority of the participants complained of loss of taste and smell, and the ratio of people who did not experience these two symptoms was less than 10%. Again, these two symptoms mostly disappeared within the first 20 days after treatment and could last longer than 30 days with a rate of 2.2%. In the 68% of patients, headache improved in the first 10 days. Back or chest pain also improved in the first 10 days with a rate of 64.3%, and widespread muscle-joint pain extended up to 20 days. There was no nasal discharge in 96.8% of the patients, and it remained as a subtle symptom in those who did. In addition; the diarrhea, which was mostly observed at the initial stage of COVID-19 disease, was also observed at a rate of 7% after treatment. With a detailed anamnesis, it was learned that these people did not take medication for diarrhea complaints and recovered in a short time. Interestingly, hair loss, a symptom that was not common in the literature before, was also observed with a frequency of 42.7%, but 34.1% of these people were women (n:63) (Table 1).



**Figure 1.** The duration of fever higher than  $38^{\circ}\text{C}$  according to age and gender (1: 1-3 days, 2: 3-5 days, 3: 5-7 days, 4: over 7 days) (gender 0: female, 1: male)



**Figure 2.** The distribution of cough complaints according to age and gender (1: 1-5 days, 2: 5-7 days, 3: 7-10 days, 4: over 10 days) (gender 0: female, 1: male)

**Table 1.** The symptoms after treatment in symptomatic COVID-19 cases

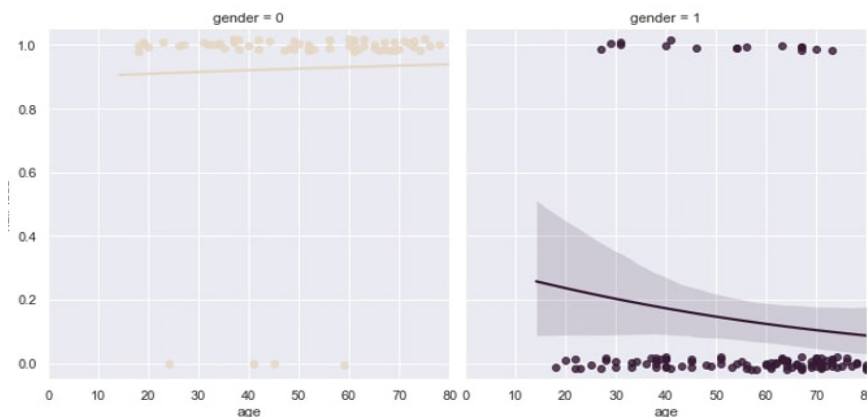
		Female (n:68)	Male (n:117)	Total (n:185)
Duration of treatment	1-7 days	15 (8.1%)	26 (14.1%)	22.2%
	7-10 days	38 (20.5%)	57 (30.8%)	51.4%
	Over 10 days	15 (8.1%)	34 (18.4%)	26.5%
<b>Symptom</b>	<b>Duration of relief</b>	<b>Female (n:68)</b>	<b>Male (n:117)</b>	<b>Total (n:185)</b>
Fever	1-3 days	35 (18.9%)	58 (31.4%)	50.3%
	3-5 days	26 (14.1%)	42 (22.7%)	36.8%
	5-7 days	6 (3.2%)	13 (7%)	10.2%
	Over 7 days	1 (0.5%)	4 (2.2%)	2.7%
Cough/ Sore Throat	1-5 days	38 (20.5%)	51 (27.6%)	48.1%
	5-7 days	23 (12.4%)	51 (27.6%)	40%
	7-10 days	5 (2.7%)	12 (6.5%)	9.2%
	Over 10 days	2 (1.1%)	3 (1.6%)	2.7%
Fatigue	1-10 days	1 (0.5%)	3 (1.6%)	2.1%
	10-20 days	19 (10.3%)	44 (23.8%)	34.1%
	20-30 days	38 (20.5%)	49 (26.5%)	47%
Shortness of breath	Over 30 days	10 (5.4%)	21 (11.4%)	16.8%
	1-10 days	1 (0.5%)	3 (1.6%)	2.1%
	10-20 days	57 (30.8%)	101 (54.6%)	85.4%
Headache	20-30 days	7 (3.8%)	11 (5.9%)	9.7%
	Over 30 days	3 (1.6%)	2 (1.1%)	2.7%
	1-10 days	49 (26.5%)	78 (42.2%)	68.6%
Back-chest pain	10-20 days	17 (9.2%)	35 (18.9%)	28.1%
	20-30 days	2 (1.1%)	4 (2.2%)	3.2%
	1-10 days	43 (23.2%)	76 (41.1%)	64.3%
Muscle-joint pain	10-20 days	22 (11.9%)	37 (20%)	31.9%
	20-30 days	3 (1.6%)	4 (2.2%)	3.8%
	1-10 days	5 (2.7%)	8 (4.3%)	7%
Loss of Taste	10-20 days	36 (19.5%)	67 (36.2%)	55.7%
	20-30 days	27 (14.6%)	42 (22.7%)	37.3%
	No	3 (1.6%)	9 (4.9%)	6.5%
	10-20 days	55 (29.7%)	96 (51.9%)	81.6%
Loss of Smell	20-30 days	9 (4.9%)	9 (4.9%)	9.7%
	Over 30 days	1 (0.5%)	3 (1.6%)	2.2%
	No	4 (2.2%)	5 (2.7%)	4.9%
Nasal discharge	10-20 days	54 (29.2%)	100 (54.1%)	83.2%
	20-30 days	9 (4.9%)	9 (4.9%)	9.7%
	Over 30 days	1 (0.5%)	3 (1.6%)	2.2%
Diarrhea	No	65 (35.1%)	114 (61.6%)	96.8%
	Yes	3 (1.6)	3 (1.6%)	3.2%
Loss of Hair	No	64 (34.6%)	108 (58.4%)	93%
	Yes	4 (2.2%)	9 (4.9%)	7%
	No	5 (2.7%)	101 (54.6%)	57.3%
	Yes	63 (34.1%)	16 (8.6%)	42.7%

## Discussion

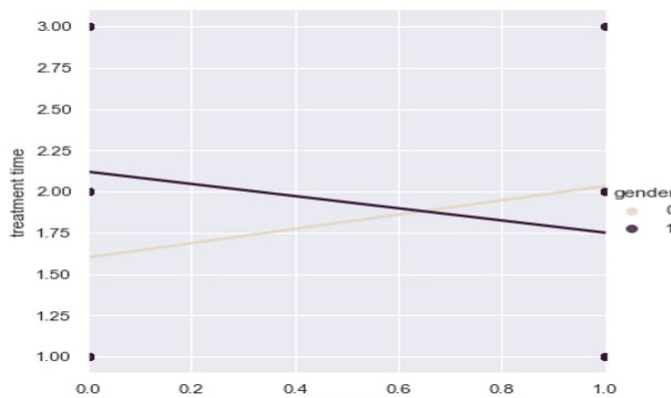
The clinical appearance of COVID-19 begins within 14 days after exposure; however, in most cases, symptoms appear after about 5 days, and symptom onset is within 11.5 days in 97.5% of individuals [8]. Although there are a wide range of studies and references related to COVID-19 in the literature, it is observed that the majority of these studies are related to the acute onset and course of cases. The disease has recently been identified. Because of its low recognition, definitions and classifications were mainly based on clinical and laboratory results. The symptoms are not specific to COVID-19, and they may occur in many families of viruses. For this reason, there are few studies on symptom characteristics. In the literature review, a detailed study about the rate of decline or duration of relief of symptoms after COVID-19 treatment could not have been found. Although the symptoms of COVID-19 are similar to the general symptoms of virus infections, in this study, it was concluded that symptoms caused by COVID-19 may last longer than other virus

infections. Even at a low rate, the duration of relief of symptoms may last longer than a month. Symptoms such as fever, headache, loss of taste and smell, myalgia, fatigue are common symptoms of general viral diseases and they are considered less important by patients. But the persistence of concerning symptoms to the patient, such as chest pain or shortness of breath, may be an issue that needs attention. These symptoms burden both people and hospitals financially, sociologically and psychologically along with recurrent hospital application.

An interesting point that was noticed in the study is that there had been a serious complaint of hair loss in patients after COVID-19 infection, of which the majority is women (total: 42.7%, women: 34.1%). As can be seen in the Figure 3, no specific distribution was observed in the complaint of hair loss by age. However, as the treatment duration prolonged, the frequency of hair loss and shortness of breath increased more in women (Figures 3 and 4). As Chen et al [9] and many studies had reported, anemia



**Figure 3.** The distribution of hair loss complaints according to age and gender (gender 0: female, 1: male, no hair loss: 0, hair loss:1)



**Figure 4.** The distribution of treatment duration and hair loss relationship by gender (gender 0: female 1: male)

developed during COVID-19 infection. As it was found out in the study, both shortness of breath, which continues after treatment, and complaints of hair loss, may be seen at a high rate and may continue for a long time. It is believed that these complaints may develop secondary to anemia that develops during the disease. It is not yet clear whether this anemia is classic iron-deficient anemia treatment is needed. However, there is no consensus on the criteria by which the complaint of shortness of breath should be monitored and how long it should be followed up, and the reliability and necessity of using imaging methods and pulmonary function tests in follow-up.

In conclusion, a standard patient follow-up algorithm has not yet been determined for post-COVID-19 treatment. The necessity for follow-up of the symptoms of the disease that appear at the treatment and persist after the treatment should be demarcated. It is also important to differentiate to avoid the financial and sociological burden of post-treatment follow-up requirement. In this context, post-treatment follow-up algorithms should be determined. There is a need for specially designed comparative and evidence-based randomized clinical trials to determine a post-treatment follow-up algorithm for COVID-19 disease whose chronic effects have not yet been clarified.

**Limitations of the study:** Our study has some limitations. The first of these is that this study is a cross-sectional study. The second is that this study has a small sample and it was conducted in a single center. In addition, larger samples and multicenter studies are needed to confirm the results of the study, since the information on the drugs and comorbidities used by all patients could not be reached.

**Conflict of interest:** No conflict of interest was declared by the author.

## References

1. Jonsdottir HR, Dijkman R. Coronaviruses and the human airway: a universal system for virus-host interaction studies. *Virol J* 2016;13-24. <https://doi.org/10.1186/s12985-016-0479-5>
2. COVID-19 (SARS-CoV-2 Enfeksiyonu) Rehberi. T.C. Sağlık Bakanlığı, Acil Sağlık Hizmetleri Genel Müdürlüğü. Available at: <https://acilafet.saglik.gov.tr/TR-64674/covid-19-sars-cov2-enfeksiyonu-rehberi.html>. Accessed December 31, 2020

3. WHO Disease Outbreak News. Available at: <https://www.who.int/csr/don/en/>. Accessed December 31, 2020
4. Cascella M, Rajnik M, Aleem A, Dulebohn SC, Napoli RD. Features, evaluation, and treatment of coronavirus (COVID-19). *StatPearls*, 2021. Available at: <https://pubmed.ncbi.nlm.nih.gov/32150360/>. Accessed December 21, 2020
5. Jones DS. History in a crisis - lessons for COVID-19. *N Eng J Med* 2020;382:1681-1683. <https://doi.org/10.1056/NEJMp2004361>
6. Covid-19 Coronavirus Pandemic. Available at: <https://www.worldometers.info/coronavirus/>. Accessed December 31, 2020
7. Guan WJ, Ni ZY, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med* 2020;382:1708-1720. <https://doi.org/10.1056/NEJMoa2002032>
8. Lauer SA, Grantz KH, Bi Q, et al. The incubation period of coronavirus disease 2019 (COVID-19) from publicly reported confirmed cases: estimation and application. *Ann Intern Med* 2020;172:577-582. <https://doi.org/10.7326/M20-0504>
9. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* 2020;395:507-513. [https://doi.org/10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7)

**Ethics committee approval:** The ethical approval was obtained with the decision No: 2021/01-31 of the Ethics Committee of Firat University and the decision No:2021-01-13T12\_58\_32 of the Ministry of Health.