

# Clinical Manifestations of Acute Symptomatic COVID-19 and frequency of Long-term COVID-19: Cross-Sectional in the Kingdom of Saudi Arabia



Khalid Mohammed Sulaiman\*, Fahad Ahmed Awad Alzhrani, Abdulrahman Mohammed Yehya Moafa and Husam Fahad Abdullah Alghuwainem

Department of Internal Medicine, Prince Sattam Bin Abdulaziz University College of Medicine, Kharj, Kingdom of Saudi Arabia

Submission: January 19, 2023; Published: January 25, 2023

\*Corresponding author: Khalid Mohammed Sulaiman Alasiri, Department of Internal Medicine, Prince Sattam Bin Abdulaziz University College of Medicine, Kharj, Kingdom of Saudi Arabia

## Abstract

**Background:** COVID-19, the disease caused by the SARS-CoV-2 virus, resulted in a pandemic and global health emergency, with 646 million infections and 6.64 million deaths worldwide. COVID-19 clinical manifestations range from asymptomatic, mild symptoms to severe illness and mortality. The current study investigated the clinical presentations and outcomes of COVID-19 in Saudi Arabia.

**Methods:** An anonymous survey was distributed through email and social media. The target population was Saudi and non-Saudi persons previously infected by COVID-19 or in contact with family members infected. The questions included demographics, mode of transmission, the symptoms and signs, the severity and duration of symptoms, vaccination, and the post-Covid manifestations if any.

**Results:** Eight hundred thirty-four individuals responded to the survey with a response rate of 70%. The source of transmission was contact with family members in 57%. The nasopharyngeal swab was performed after contact and after the appearance of symptoms in 46% and 54%, respectively. Eighteen percent of respondents reported that they have more than one COVID-19 infection. Twelve percent of respondents received one or two SARS-CoV-2 vaccine doses but developed post-vaccine COVID-19. The presenting symptoms were fever, headache, sore throat, muscle pains, loss of smell and test, runny nose, dry cough, and shortness of breath in 45%, 39%, 31%, 29%, 25%, 16%, 12%, and 11% respectively. The duration of illness ranged between 5 to 21 days. The severity of symptoms (on a scale of 1-10) was 1,2,3,4,5 in 24%, 18%, 27%, 14%, and 15% respectively. The isolation was at home at 92%, and 8% was in the hospital. One twenty-seven respondents (15%) had post-COVID conditions in the form of fatigue, headache, numbness, numbness, dizziness, and changes in smell and taste.

**Conclusion:** These findings showed that fever, headache, sore throat, and dry cough were the most frequent symptoms of acute COVID-19. Contact with an infected family member (s) was a standard transmission mode. Overall, the infection was moderate and did not require hospitalization. Post-COVID symptoms occurred in some respondents but mainly were self-limited.

**Keywords:** COVID-19 2; Vaccines; COVID-19 related disease; SARS CoV2 vaccines

## Introduction

COVID-19 was first isolated from biological samples in Wuhan, Chania, in December 2019. The virus was identified as a member of the beta coronavirus, SARS and MERS. In late December 2019, a novel virus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), also known as 2019 novel coronavirus (2019-nCoV) [1,2]. The genomic sequence of this newly emerged virus is similar to that of severe acute respiratory syndrome coronavirus (SARS-CoV-2), with a 79.6% sequence identity. Coronaviruses are enveloped, positive-stranded RNA viruses with a genome of approximately 30 kb. Coronaviruses are classified into human coronavirus OC43 (HCoV-OC43) and bovine coronavirus (BCoV),

demonstrating antigenic and genetic similarities [3]. As of December 2022, 646 million cases and 6.6 million deaths have been reported [4].

The first SARS-CoV-2 case was announced on March 2, 2020. Since then, cases have increased rapidly, and the COVID-19 mass vaccination campaign started in December 2020. A total of 826,000 COVID-19 cases and 9476 have been reported. On March 18, 2020, the Saudi health authorities imposed prophylactic measures, including a nationwide lockdown, borders closure, domestic and international flights, and in-country transport suspension [5]. In addition, multilingual health orientation messages were sent daily

through social media and mobile SMS to update citizens and expatriates on the current pandemic situation and the importance of implementing the prophylactic measures. During the lockdown, home delivery of groceries, food, and medicines was efficiently maintained. The Saudi Ministry of Health provides a 24/7 hotline that responds to health inquiries and advises handling suspected COVID-19 cases, including nasopharyngeal swabs and ambulance services [6].

Furthermore, the MoH conducted on-site campaigns for nasopharyngeal swabbing for screening. Experienced public health specialists and healthcare workers performed contact tracing and advised infected individuals about the location and interval of isolation at home or specified places [7]. Testing, screening, and hospitalization (including intensive care admission) were provided free of charge to all inhabitants. In addition, the Kingdom established a robust COVID-19 registry and several platforms to specify the COVID-19 status (Tawakalna <https://ta.sdaia.gov.sa/en/index>; Sehaty <https://www.moh.gov.sa/en/eServices/Sehaty/Pages/default.aspx>, and Tabaud <http://bit.ly/2Kesalc>). Saudi MoH established a committee that reviewed all vaccines in the pipeline and provided emergency licensing of several vaccines, including Pfizer BioNTech, Astra Zeneca, Moderna, and Johnson and Johnson. Thus, KSA made the COVID-19 vaccines available starting as early as December 2020. Elderly patients with chronic diseases and healthcare workers were initially prioritized for vaccine administration. Mass vaccination campaigns followed, covering citizens and expatriates of all age groups. Vaccination significantly reduced the incidence of COVID-19 infections, severe disease, and hospitalizations [7,8].

High transmission rates characterize SARS-CoV-2 through droplet, contact, or airborne transmission. Persons are infected with SARS-CoV-2 through exposure to respiratory droplets released during coughing, sneezing, and talking of individuals. Additional methods include contact or airborne information of droplets that linger in the air over long distances (usually greater than 6 feet) [9-11]. Viral shedding varies between infected persons and may depend on disease severity. A 2022 systematic review and meta-analysis showed that the mean duration of RT-PCR positivity was 27.9 days, and the mean duration of SARS-CoV-2 shedding was 26.5 days among immunocompetent individuals. Still, it may be prolonged in immunocompromised patients in whom the mean period of infectivity may reach 29.5 days [12-14].

COVID-19 causes a respiratory tract infection with a clinical spectrum ranging from asymptomatic to acute respiratory distress syndrome. The median incubation period was estimated to be 2.8 days. SARS-CoV-2 infection may present with mild symptoms or may be symptomatic. The frequent symptoms include fever or chills, fatigue, headache, cough, shortness of breath or difficulty breathing, muscle or body aches, sore throat, nasal congestion or runny nose, nausea or vomiting or diarrhea, and new loss of taste or smell [15-17]. Patients with chronic diseases such as diabetes,

hypertension, overweight or obesity, sickle cell disease, solid or hematologic malignancies, bronchial asthma and chronic lung diseases, HIV immunosuppressed patients or those receiving immunosuppressive medications are at risk of developing severe symptomatic, prolonged COVID-19 and serious complication [18,19]. Typically, resolution of symptoms and recovery occurs in most patients infected with acute COVID-19. However, some individuals develop post-covid symptoms or long Covid-19 that may persist beyond 36 weeks. A recent international systematic review estimated that 43% of adult patients with covid-19 might complain of at least one symptom one month after infection. About 55% of patients with severe COVID-19 admitted to the hospital are more at risk of developing post-Covid-19 symptoms [19,20].

To mitigate the impacts of COVID-19 and decrease viral spread, KSA was one of the first countries to start COVID-19 vaccination in December 2020 [7]. Nationwide vaccination was accompanied by the broad orientation of the population regarding the critical role of immunization in controlling viral spread, reducing severe disease manifestations, and allowing the gradual return of everyday life activities [15]. Thus, there is a need to understand the factors associated with vaccination willingness in Saudi Arabia given that it has a publicly funded healthcare system and coronavirus-related testing and treatment have been provided to both national and non-national residents at no cost. Although a previous study assessing the acceptance of a hypothetical COVID-19 vaccine was conducted among the general public of the Kingdom of Saudi Arabia (KSA) [16], the current study sheds lighter on vaccine acceptance by further investigating determinants, such as past vaccination behavior, health status, and support for compulsory vaccination. Following the recent approval of the Pfizer-BioNTech COVID-19 vaccine (Pfizer Inc. and BioNTech SE) in Kingdom of Saudi Arabia (KSA) coupled with the spread of false information [17], it is crucial to assess the acceptance of vaccination at this time since vaccination decisions can be multifactorial and can change over time. Therefore, this study aimed to determine acceptance of the COVID-19 vaccine and investigate factors affecting intentions to be vaccinated against COVID-19 among the general public in KSA. By gaining a deeper understanding of the estimates of COVID-19 vaccine acceptance and influencing factors, health authorities and policymakers can develop evidence-informed communication strategies aimed at building confidence in a vaccine developed in record time, thereby improving vaccination uptake among the general population. The current study assessed the symptoms frequently associated with acute COVID-19, the frequency of long-term COVID-19, and the rate of recurrence of COVID-19 after vaccination in the Saudi population.

### Methodology

The study designs the research was an observational cross-sectional study. This questionnaire is done in Arabic and contains 21 questions, it is directed at who have been confirmed infected with covid19 or have contact with family members infected, and their

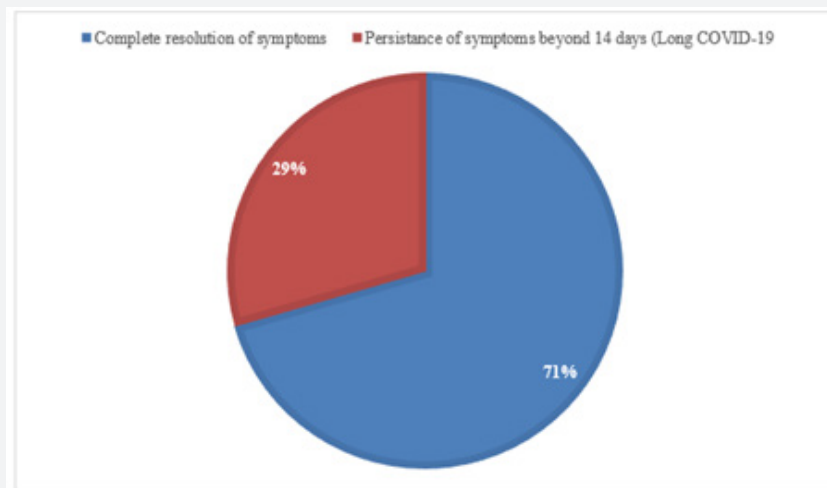
information has been confidential. Our questions were about the possible mode of transmission, diagnoses, age group, gender, nationality, weight, height, and taking the place of residence. Another set of questions included the first symptoms that appeared, the symptoms that followed, the disease duration, the last symptoms that disappeared, and the severity. Participants were also asked about any symptoms after acute COVID resolved. Other questions were about the recurrence of COVID 19 infection and if the vaccine was taken. This questionnaire was done on the Google Document and was published via email and the following social media (WhatsApp -Telegram-Snapchat-Twitter).

**Results**

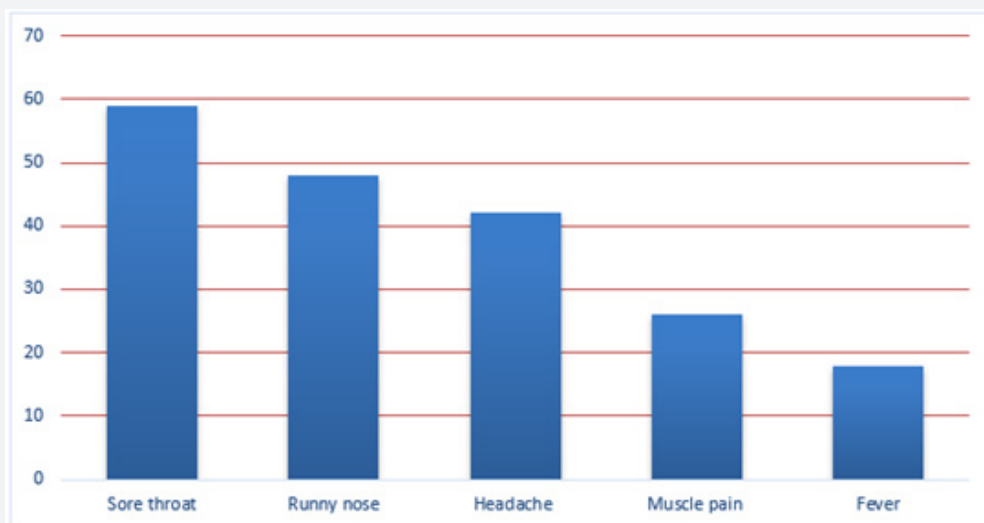
A total of 468 participants responded to the survey. All participants received at least one dose of COVID-19 vector or RNA vaccine following the first COVID-19 infection.

The results are summarized as follows Table 1 & Table 1.

Twenty-nine percent of patients had residual symptoms fourteen days after the acute attack and after a negative nasopharyngeal swab with SARS-CoV2 negative RT-PCR (Long-term COVID-19) (Figure 1). The main symptoms are shown in Table 3. All participants received at least one dose of COVID-19 vector or mRNA vaccines after the first acute COVID-19 infection. However, 92 (19.7%) who did not complete the vaccination schedule had more than one post-vaccine acute COVID-19 infection. The symptoms of the post-vaccinations COVID-19 infections were significantly milder than in vaccine naïve individuals. Post-COVID manifestation (at least one symptom) significantly associated with age of subjects and the presence of chronic diseases (Figure 2). The Y axis shows the number of patients, and the X axis shows the symptoms [21-28].



**Figure 1:** Frequency of persistence of symptoms beyond 14 days of acute COVID-19 infection (long-term COVID-19).



**Figure 2:** Clinical manifestations of post-vaccine COVID-19 infections.

Table 1.

Parameter	N=468
Age (years)	Range: 19-48
	Median: 26
	Mean $\pm$ SD: 22.19 $\pm$ 4.61
	95% CI: 19.4030 to 49.3918
Male, n (%)	259 (54.27%)
Female, n (%)	209 (44.7%)
Duration of acute symptoms (days)	Range: 3-10
	Median: 5
	Mean $\pm$ SD: 4.75 $\pm$ 3.83
	95% CI: 1.369 to 11.042
Isolation period (days)	Range: 2-14
	Median: 7
	Mean $\pm$ SD: 10.23 $\pm$ 4.331
	95% CI: 5.539 to 15.922
Hospitalization, n (%)	13 (2.8%)

Table 2: Symptoms that appeared during COVID-19 acute stage.

Presenting symptoms	Number (%)
Fever	214 (45.8%)
Sore throat	219 (46.9%)
Loss of sense of smell or taste	201 (43%)
Muscle pains	228 (48.8%)
Runny nose	106 (22.7%)
Headache	102 (21.8%)
Dry cough	74 (15.8%)
Abdominal pain	49 (10.5%)
Productive cough	31 (6.6%)
Diarrhea	30 (6.4%)
Arthralgia	28 (5.9%)
Nausea or vomiting	25 (5.3%)

Table 3: Symptoms in 138 patients who developed long-term COVID-10.

Presenting symptoms	Number (%)
Fever	2 (1.4%)
Sore throat	2 (1.4%)
Loss of sense of smell or taste	53 (38.4%)
Muscle pains	18 (13%)
Headache	12 (8.7%)
Dry cough	10 (7.2%)
Abdominal pain	5 (3.6%)
Productive cough	8 (5.8%)
Arthralgia	5 (3.6%)

## Discussion and Conclusion

Most infected individuals with mild-to-moderate COVID-19, which persist for 5-10 days. Out of more than 468 patients that responded to the survey, we found that the most symptoms were fever, sore throat, cough, muscle pain, and loss of sensations of smell and taste in accordance with Baj et al. 2020 and Docherty et al. [8]. In another study, patients with COVID-19 are known to have a fever, cough, headache, loss of smell, and general deterioration of the GI system Balachandar et al. [5]. Therefore, most cases did not need hospitalization. We also found that most patients are isolated in the home in agreement with Ayaz et al. 2020. We found the duration of acute symptoms was five days in 39%, 6 to 10 days in 26%, then over 2 weeks 24% agreement with Noh et al. [19] and Docherty et al. [8]. Long-term COVID-19 was observed in 29% of patients who had residual symptoms patients complained of symptoms more than fourteen days after the acute attack resolution in agreement with the findings of Domènech-Montoliu et al. [9]. Although all participants received at least one dose of the COVID-19 vaccine after the first acute COVID-19 infection, about 20% of those who did not complete the vaccine schedule had post-vaccination COVID-19. The symptoms were milder than the first attack in accordance with Brunvoll et al. 2023. In conclusion, the acute COVID-19 symptoms resolve in most cases within 14 days of infection. However, long-term COVID-19 manifestations may extend for longer periods that may exceed to 24 weeks. In addition, recurrent COVID-19 occurs in individuals who do not complete the vaccinations; thus, it is critical to receive the complete vaccination.

## References

- Aiyegbusi OL, Hughes SE, Turner G, et al. (2021) TLC Study Group. Symptoms, complications, and management of long COVID: a review. *J R Soc Med* 114(9): 428-442.
- Algaissi AA, Alharbi NK, Hassanain M, Hashem AM (2020) Preparedness and response to COVID-19 in Saudi Arabia: Building on MERS experience. *J Infect Public Health* 13(6): 834-838.
- Argenziano MG, Bruce SL, Slater CL, et al. (2020) Characterization and clinical course of 1000 patients with coronavirus disease 2019 in New York: retrospective case series. *BMJ* 369: m1996.
- Ayaz CM, Dizman GT, Metan G, Alp A, Unal S (2020) Out-patient management of patients with COVID-19 on home isolation. *Infez Med* 28(3) 351-356.
- Balachandar V, Mahalaxmi I, Subramaniam M, Kaavya J, Kumar NS, Laldinmawii G, et al. (2020) Follow-up studies in COVID-19 recovered patients-is it mandatory? *Sci Total Environ* 729: 139021.
- Brunvoll SH, Nygaard AB, Fagerland MW, Holland P, Ellingjord-Dale M, et al. (2023) A Post-acute symptoms 3-15 months after COVID-19 among unvaccinated and vaccinated individuals with a breakthrough infection. *Int J Infect Dis* 126: 10-13.
- CDC. 2019 Novel Coronavirus, Wuhan, China. CDC.
- Docherty AB, Harrison EM, Green CA, Hardwick HE, Pius R, et al. (2020) ISARIC4C Investigators. Features of 20 133 UK patients in hospital with COVID-19 using the ISARIC WHO Clinical Characterisation Protocol: Prospective observational cohort study. *BMJ* 369: m1985.
- Domènech-Montoliu S, Puig-Barberà J, Pac-Sa MR, Vidal-Utrillas P, Latorre-Poveda M, et al. (2022) Complications Post-COVID-19 and Risk Factors among Patients after Six Months of a SARS-CoV-2 Infection: A Population-Based Prospective Cohort Study. *Epidemiologia (Basel)* 3(1): 49-67.

10. Faisal K, Alshammari S, Alotaibi R, Alhothali A, Bamasag O, et al. (2022) Spatial Analysis of COVID-19 Vaccine Centers Distribution: A Case Study of the City of Jeddah, Saudi Arabia. *Int J Environ Res Public Health* 19(6): 3526.
11. Guan WJ, Ni ZY, Hu Y (2020) Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med* 382(18): 1708-1720.
12. Handiso TB, Jifar MS, Nuriye Hagisso S (2022) Coronavirus's (SARS-CoV-2) airborne transmission. *Sage Open Med* 10: 20503121221094185.
13. Hanawi MK, Angawi K, Alshareef N, Qattan AMN, Helmy HZ, et al. (2020) Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study. *Front. Public Health* 8: 217.
14. Johns Hopkins COVID-19 tracking system.
15. Jordan RE, Adab P, Cheng KK (2020) Covid-19: risk factors for severe disease and death 368: m1198.
16. Kompaniyets L, Pennington AF, Goodman AB, et al. (2021) Underlying medical conditions and severe illness among 540,667 adults hospitalized with covid-19, March 2020-March 2021. *Prev Chronic Dis* 18: E66.
17. Leen Vijgen, Els Keyaerts, Elie Moës, Inge Thoelen, Elke Wollants, (2005) Complete Genomic Sequence of Human Coronavirus OC43: Molecular Clock Analysis Suggests a Relatively Recent Zoonotic Coronavirus Transmission Event. *J Virol* 79(3): 1595-1604.
18. Liu Y, Yan LM, Wan L, Xiang TX, Le A, et al. (2020) Viral dynamics in mild and severe cases of COVID-19. *Lancet Infect Dis* 20(6):656-657.
19. Noh JY, Yoon JG, Seong H, Choi WS, Sohn JW, et al. (2020) Asymptomatic infection and atypical manifestations of COVID-19: comparison of viral shedding duration. *The Journal of Infection* 81(5):816-846.
20. Obeid DA, Alhamlan FS, Al-Qahtani AA, Al-Ahdal MN (2020) Containment of COVID-19: the unprecedented response of Saudi Arabia. *J Infect Dev Ctries* 14(7): 699-706.
21. Pascarella G, Strumia A, Piliago C, Bruno F, Del Buono R, et al. (2020) COVID-19 diagnosis and management: a comprehensive review. *Journal of Internal Medicine* 288(2):192-206.
22. Palacios Cruz M, Santos E, Velázquez Cervantes MA, León Juárez M (2020) COVID-19, a worldwide public health emergency. *Rev Clin Esp* S0014-2565(20): 30092-30098.
23. Rahmani A, Dini G, Leso V, Montecucco A, Kuszniir Vitturi B, et al. (2022) Duration of SARS-CoV-2 shedding and infectivity in the working age population: a systematic review and meta-analysis. *Med Lav* 113(2): e2022014.
24. Ramzy A, McNeil DG (2021) W.H.O. Declares Global Emergency as Wuhan Coronavirus Spreads. *The New York Times*.
25. Saudi Ministry of Health. COVID-19.
26. Wang Z, Liao H, Marley G, Wu D, Tang W (2020) Epidemiologic, clinical, and laboratory findings of the COVID-19 in the current pandemic: systematic review and meta-analysis. *BMC Infect Dis* 20(1): 640.
27. (2020) WHO. Coronavirus disease (COVID-19) pandemic. (Internet): available at: Coronavirus disease (COVID-19) pandemic.
28. Zhou B, She J, Wang Y, Ma X (2020) The duration of viral shedding of discharged patients with severe COVID-19. *Clin Infect Dis* 71(16):2240-2242.



This work is licensed under Creative Commons Attribution 4.0 License  
DOI: [10.19080/ARR.2023.08.555736](https://doi.org/10.19080/ARR.2023.08.555736)

### Your next submission with Juniper Publishers will reach you the below assets

- Quality Editorial service
- Swift Peer Review
- Reprints availability
- E-prints Service
- Manuscript Podcast for convenient understanding
- Global attainment for your research
- Manuscript accessibility in different formats  
( Pdf, E-pub, Full Text, Audio)
- Unceasing customer service

Track the below URL for one-step submission

<https://juniperpublishers.com/online-submission.php>