

ORIGINAL RESEARCH

EPIDEMIOLOGICAL CHARACTERIZATION OF ASYMPTOMATIC AND SYMPTOMATIC COVID-19 CASES AT A TERTIARY CARE HOSPITAL, HYDERABAD

¹Dr Meda Shailaja Rani, ²Dr T Sunitha Reddy, ³Dr G ArshiyaNizami, ⁴Dr KalpanaNenavath, ⁵Dr Sudha Rani .V,

¹Assistant Professor, Department of Microbiology SRRITCD (Government Fever Hospital) Osmania Medical College, Nallakunta, Hyderabad, Telangana, India

²Assistant Professor, Department of Paediatrics, SRRITCD (Government Fever Hospital) Osmania Medical College, Nallakunta, Hyderabad, Telangana, India

³2ndyr Post Graduate, Department of Microbiology, Osmania Medical College, Koti, Hyderabad, Telangana, India

⁴Assistant Professor, Department of Paediatrics, Niloufer Hospital/Osmania Medical College, Lakdi-Ka-Pool, Hyderabad, Telangana, India.

⁵Professor and HOD, Department of Microbiology, Osmania Medical College, Koti, Hyderabad, Telangana, India

Correspondence:

Dr Kalpana Nenavath

Assistant Professor, Department of Paediatrics, Niloufer Hospital/Osmania Medical College, Lakdi-Ka-Pool, Hyderabad, Telangana, India

ABSTRACT:

Introduction: Coronavirus disease 2019 (COVID-19) emerged in China, in December 2019. Asymptomatic COVID-19 infections reported having a similar viral load as those of symptomatic infections. To better understand the identified COVID-19 cases, in this study we characterized COVID-19 cases in to asymptomatic and symptomatic and epidemiological factors associated with positivity and its strength of association.

Aim: To study epidemiological characterization of asymptomatic and symptomatic COVID-19 cases.

Materials and methods: The present work is a retrospective observational study. Samples of All age groups, all genders are included in the study and subjected to RT-PCR test in VRDL, Osmania medical college. Only patients having clinical and demographic information and confirmed positive or negative status from SARS-CoV-2 test were considered.

Results: During the study period of 3 months from may 2021 to July 2021, most of the positive cases were males (62.5%) in the age group of 20-40 years. Asymptomatic positives are slightly higher than symptomatic. Cough is the most common symptom followed by fever and sore throat in RT-PCR test positive individuals.

Conclusion: The incidence of COVID-19 was high with a significant proportion of asymptomatic carriers. Continuous surveillance, monitoring and home isolation of asymptomatic carriers, will decrease transmission rate in the community

Keywords: Coronavirus disease, asymptomatic carriers, transmission rate

INTRODUCTION:

Coronavirus disease 2019 (COVID-19) emerged in China, in December 2019[1], has rapidly spread globally in >215 countries, affecting over 77 million people and causing over 1.7 million deaths, as of December 22, 2020[2]. Approximately 80% of COVID-19 cases are asymptomatic or mild, 15% are severe and require oxygen, and 5% are critical infections that require ventilation[3]. Asymptomatic infection refers to the identification of viral nucleic acid by reverse transcriptase polymerase chain reaction (RT-PCR) in patients not displaying typical clinical symptoms. Asymptomatic COVID-19 infections reported having a similar viral load as those of symptomatic infections[4,5]. Contracting viral infection without showing clinical symptoms is highly likely to occur in the event of close contact with confirmed cases. The viral RNA can be detected in the respiratory secretions of asymptomatic patients for no less than 3–5 days. Thus, a mild or asymptomatic COVID-19 case can potentially transmit the virus to other people without any awareness.

In several studies, the prevalence of asymptomatic COVID-19 positive cases has ranged from 20% to 86%; such asymptomatic cases are defined as individuals with positive viral nucleic acid tests but without any COVID-19 symptoms[6-8]. To better understand the identified COVID-19 cases, in this study we characterized COVID-19 cases in to asymptomatic and symptomatic and epidemiological factors associated with positivity and its strength of association.

MATERIALS AND METHODS:

All the samples received for COVID-19 RT-PCR testing at VRDL, Osmania medical college during the months of may-july 2021 were included in the study. Self-reported sociodemographic characteristics (age, sex, nationality, and District of residence), symptomatic status of patients were also collected.

STUDY DESIGN AND STUDY POPULATION:

The present work is a retrospective observational study. Samples of All age groups, all genders are included in the study and subjected to RT-PCR test in VRDL, Osmania medical college. Only patients having clinical and demographic information and confirmed positive or negative status from SARS-CoV-2 test were considered.

PROCEDURE:

Individuals with history of URTI or LRTI and suspected of SARS-COV 2 infection were included in the study and VTM samples collected for the same. These samples were received at VRDL, OMC were subjected to RNA extraction either manually or by automated method, RT-PCR test done and results were analysed.

RESULTS:

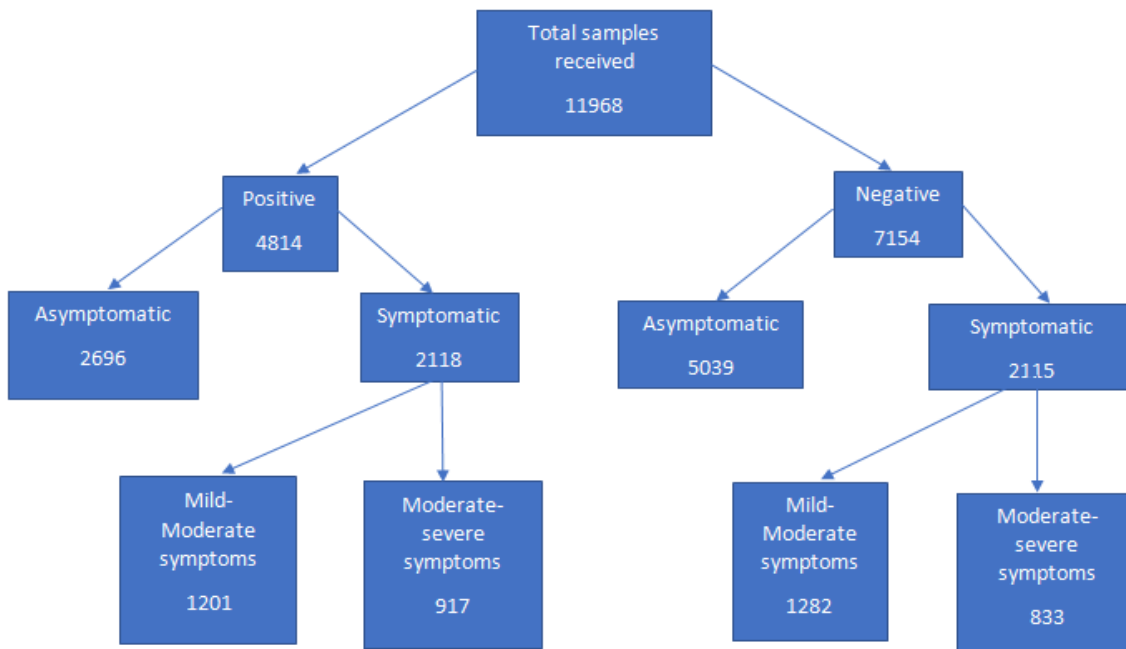
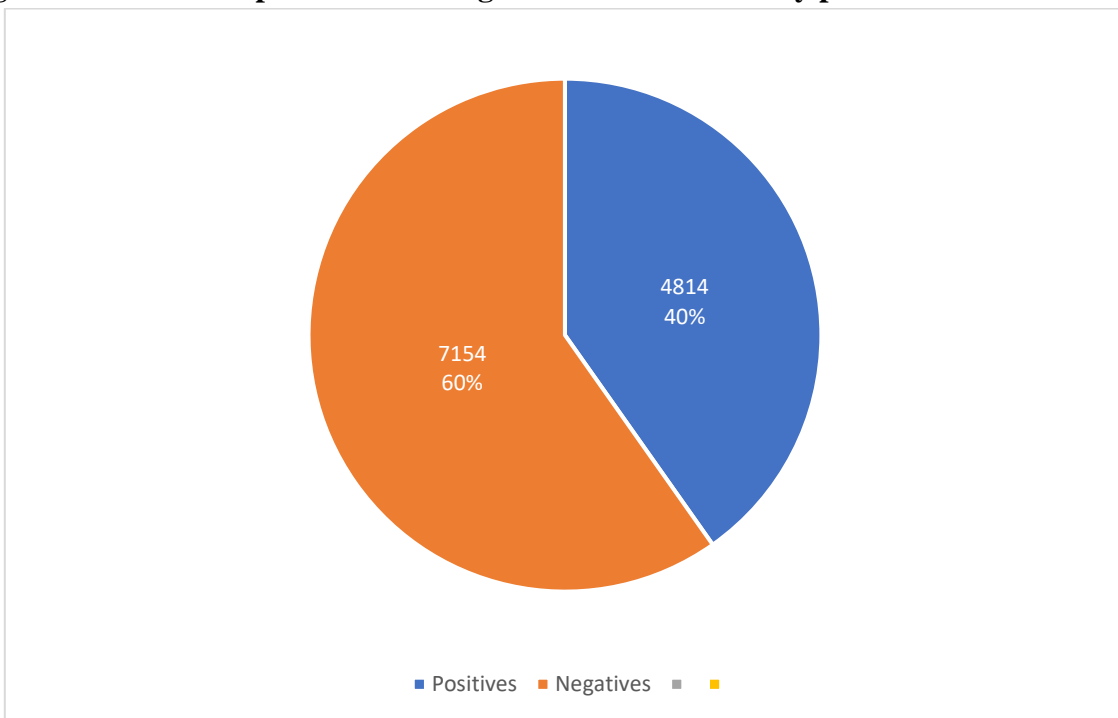
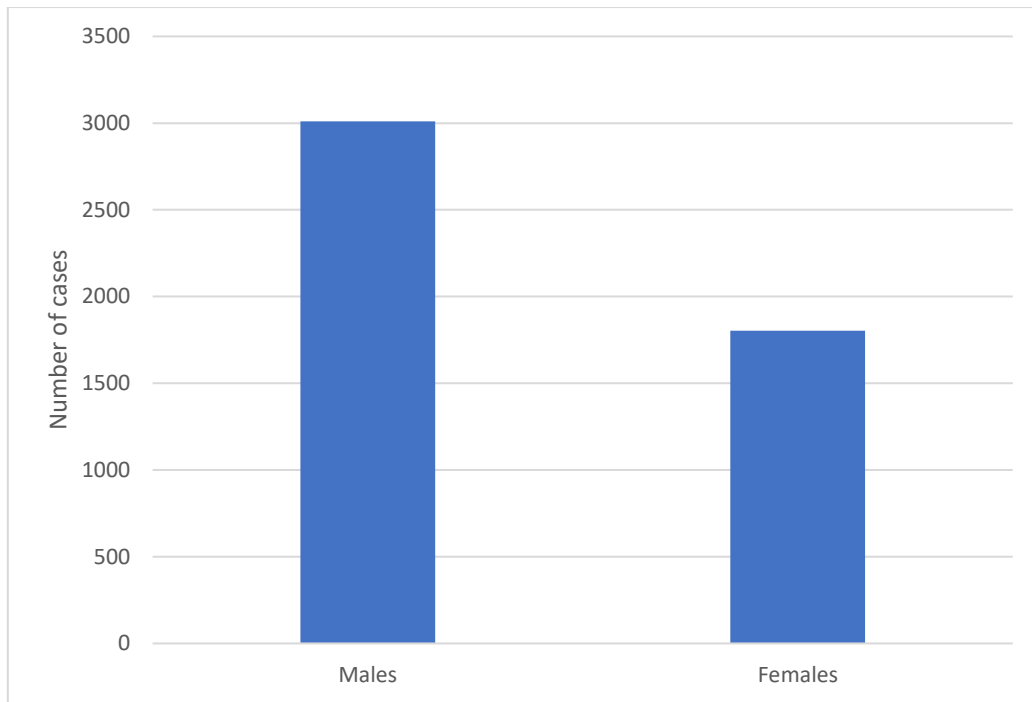


Figure-1: Number of positives and Negatives detected in study period



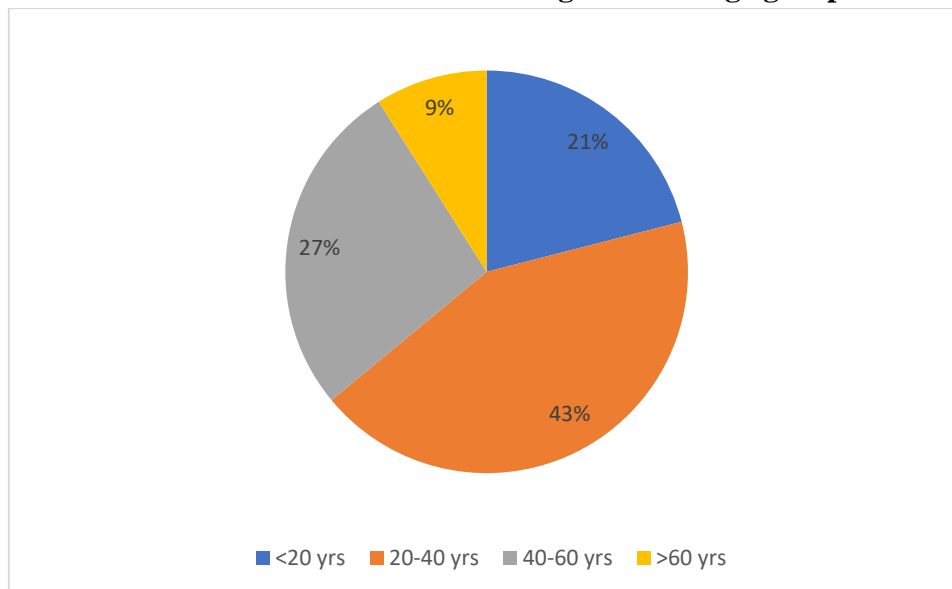
In all the symptomatic cases negatives are 40% of the population.

Figure-2: Gender distribution in present study.



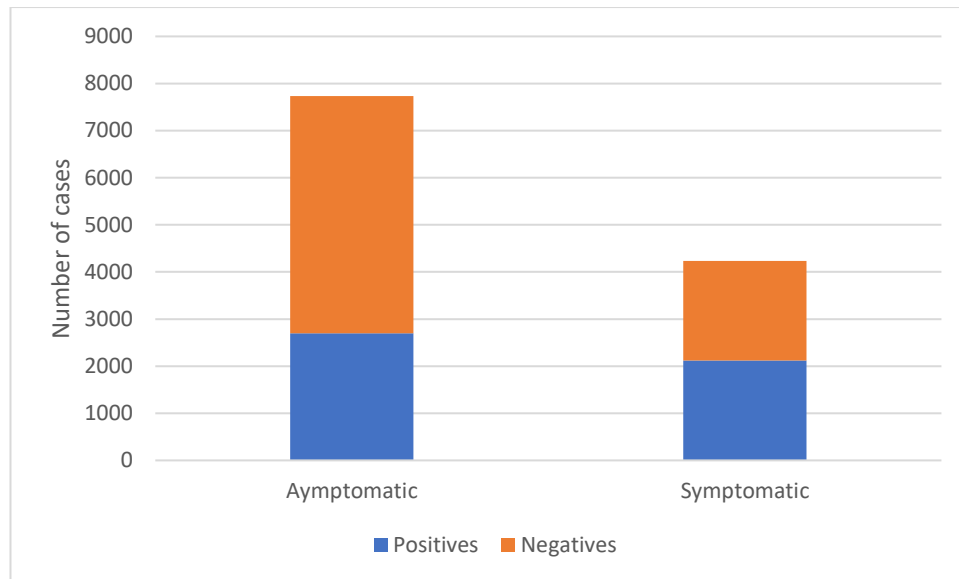
Males are more than females in paositve cases in present study.

Figure-3: Distribution of covid-19 infection among different age groups



In present population age between 20-40 years are most effected age interval.

Figure-4: Asymptomatic and symptomatic among COVID-19 positive and negative samples



Asymptomatic carriers are more positive in present figure showing covid transmission

Table-1: Covid 19 distribution with severity of disease

COVID-19	Mild-Moderate symptoms	Moderate-severe symptoms
Positive	1201	917
Negative	1282	833

DISCUSSION:

During the study period of 3 months from may 2021 to July 2021, 11968 samples were received and subjected to RT-PCR at VRDL, Osmania medical college. 4814(40%) tested positive for COVID-19, of those 2696 patients were asymptomatic and 1201 were symptomatic with mild symptoms like cough, fever, sore throat and 917 had moderate to severe symptoms like chest pain, breathlessness, haemoptysis. 7154(60%) samples were negative, of those 5039 patients were asymptomatic, 1282 had mild symptoms and 833 had moderate to severe symptoms. Oran and Topol⁵ aimed to determine the prevalence of asymptomatic SARS-CoV-2 infection. They concluded that asymptomatic persons seem to account for 40% to 45% of the infections. Studies concluded that the proportion of asymptomatic patients might account for approximately 40% to 45% of SARS-CoV-2 infections based on results of 16 cohort studies from different sources. Unfortunately, however, this article did not include any of the studies from China. Asymptomatic infection may be associated with subclinical lung abnormalities, as detected by computed tomography. Because of the high risk for silent spread by asymptomatic persons, it is imperative that testing programs include those without symptoms.^{6,7,8}

In our study COVID-19 positivity detected in 3010 (62.5%) males, 1804 (37.5%) females. One study of 425 patients with COVID-19 indicated that 56% were males.⁹ Another study of 140 patients found that 50.7% were males.¹⁰ Therefore, gender is a risk factor for higher severity and mortality in patients with COVID-19, independent of age and susceptibility.

In present study 21% (1010) of positive cases were of <20 years of age, 43% (2070) were between 20-40 years, 27% (1300) were 40-60 years, 9% (434) were > 60 years age group. The

incidence of SARS-CoV-2 infection is seen most often in median age of the patients was between 34 and 59 years in previous studies.^{11,12,13,14}

The most symptom in positive individuals is cough (60%) followed by fever, sore throat (30%) and other symptoms like diarrhoea, abdominal pain, chest pain and breathlessness seen in 10% of individuals. Prevention (CDC) recognized three principal symptoms for COVID-19: fever, cough, and shortness of breath.¹ This list was expanded as the pandemic progressed to include chills, myalgias, headache, sore throat, and the loss of taste (ageusia) and/or smell (anosmia). An early systematic review that included 1,576 hospitalized COVID-19 patients reported that the most prevalent clinical symptom was fever, followed by cough, fatigue and dyspnea.¹⁵ A later review reported the main clinical symptoms to be fever, cough, fatigue, slight dyspnea, sore throat, headache, conjunctivitis and gastrointestinal issues.¹⁶ In a community-based study involving self-reported symptoms via a mobile app, 10 symptoms -- fever, persistent cough, fatigue, shortness of breath, diarrhea, delirium, skipped meals, abdominal pain, chest pain and hoarse voice - were associated with self-reported positive test results in a UK cohort.¹⁷ A Cochrane systematic review⁵ identified a total of 27 signs and symptoms for COVID-19.

The role of public health professionals is to provide science-based, data-driven recommendations in a timely manner to curb pandemic spread and prevent disease and deaths. Often, decisions made with the intent to reduce the disease burden during a pandemic are made with incomplete information. Effectiveness of mitigation strategies and adoption of recommended behaviors must be continually reevaluated throughout the pandemic, even as vaccination continues, and prevention strategies must be adapted to the current situation and local context, informed by local data, such as case-control investigations. A tremendous amount has been learned about SARS-CoV-2 transmission over the past year, and a greater awareness of transmission dynamics, including uneven spread of the virus within communities, can be used to guide targeted interventions and policies.

This study lends important insight into provider experiences in the context of the COVID-19 outbreak. There are, however, a number of limitations. Due to the novel nature of this outbreak and the related work changes, some of the administered measures were created or adapted for this study and do not yet have published psychometrics, making cross-study comparison challenging. Also, this study did not include client- or treatment-level information, such as client perspectives.

CONCLUSION:

The incidence of COVID-19 was high with a significant proportion of asymptomatic carriers. Continuous surveillance, monitoring and home isolation of asymptomatic carriers, will decrease transmission rate in the community. In <40 years individuals with mild symptoms home isolation, symptomatic treatment can be given and >40 yrs. individuals with moderate to severe symptoms may require hospital administration and further monitoring.

REFERENCES:

1. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A Novel Coronavirus from Patients with Pneumonia in China, 2019. *N Engl J Med.* 2020; 382(8):727–33.

<https://doi.org/10.1056/NEJMoa2001017> PMID: 31978945; PubMed Central PMCID: PMC7092803.

2. Worldometers. COVID-19 coronavirus pandemic [Internet]. [cited 2020 June 2] Available from: [https:// www.worldometers.info/coronavirus/#countries](https://www.worldometers.info/coronavirus/#countries)
3. World Health Organization. Coronavirus disease 2019 (COVID-19) situation report– 46 [Internet]. [cited 2020 June 1] Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200306-sitrep-46-covid-19.pdf?sfvrsn=96b04adf_4.
4. Zou L, Ruan F, Huang M, Liang L, Huang H, Hong Z, et al. SARS-CoV-2 Viral Load in Upper Respiratory Specimens of Infected Patients. *N Engl J Med*. 2020; 382(12):1177–9. <https://doi.org/10.1056/NEJMc2001737>
5. Daniel P. Oran, Eric J. Topol [Prevalence of Asymptomatic SARS-CoV-2 Infection: A Narrative Review](#). *Ann Intern Med*.2020;173:362-367. [Epub 3 June 2020]. doi:[10.7326/M20-3012](https://doi.org/10.7326/M20-3012)
6. Cheng H, Jian S, Liu D, et al. Contact Tracing Assessment of COVID-19 Transmission Dynamics in Taiwan and Risk at Different Exposure Periods Before and After Symptom Onset. *JAMA Intern Med*. 2020;180(9):1156–1163. doi:10.1001/jamainternmed.2020.2020
7. Park S, Kim Y, Yi S, Lee S, Na B, Kim C, et al. Coronavirus Disease Outbreak in Call Center, South Korea. *Emerg Infect Dis*. 2020;26(8):1666-1670. <https://doi.org/10.3201/eid2608.201274>
8. Payne DC, Smith-Jeffcoat SE, Nowak G, et al. SARS-CoV-2 Infections and Serologic Responses from a Sample of U.S. Navy Service Members — USS Theodore Roosevelt, April 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:714–721. DOI: <http://dx.doi.org/10.15585/mmwr.mm6923e4>
9. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early Transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *N Engl J Med*. (2020) 382:1199–207. doi: 10.1056/NEJMoa2001316
10. Zhang JJ, Dong X, Cao YY, Yuan YD, Yang YB, Yan YQ, et al. Clinical characteristics of 140 patients infected by SARS-CoV-2 in Wuhan, China. *Allergy*. (2020). doi: 10.1111/all.14238
11. Bai Y, Yao L, Wei T, Tian F, Jin DY, Chen L, Wang M. Presumed Asymptomatic Carrier Transmission of COVID-19. *JAMA*. 2020 Apr 14;323(14):1406-1407. doi: 10.1001/jama.2020.2565.
12. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, Wang B, Xiang H, Cheng Z, Xiong Y, Zhao Y, Li Y, Wang X, Peng Z. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA*. 2020 Mar 17;323(11):1061-1069. doi: 10.1001/jama.2020.1585.
13. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X, Cheng Z, Yu T, Xia J, Wei Y, Wu W, Xie X, Yin W, Li H, Liu M, Xiao Y, Gao H, Guo L, Xie J, Wang G, Jiang R, Gao Z, Jin Q, Wang J, Cao B. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020 Feb 15;395(10223):497-506. doi: 10.1016/S0140-6736(20)30183-5..

14. Chang D, Lin M, Wei L, Xie L, Zhu G, Dela Cruz CS, Sharma L. Epidemiologic and Clinical Characteristics of Novel Coronavirus Infections Involving 13 Patients Outside Wuhan, China. *JAMA*. 2020 Mar 17;323(11):1092-1093. doi: 10.1001/jama.2020.1623.
15. Yang J, Zheng Y, Gou X, et al. Prevalence of comorbidities and its effects in coronavirus disease 2019 patients: A systematic review and meta-analysis. *International journal of infectious diseases : IJID : official publication of the International Society for Infectious Diseases* 2020; 94: 91–5.
16. Pascarella G, Strumia A, Piliego C, Bruno F, Del Buono R, Costa F, Scarlata S, Agrò FE. COVID-19 diagnosis and management: a comprehensive review. *J Intern Med*. 2020 Aug;288(2):192-206. doi: 10.1111/joim.13091
17. Menni C, Valdes AM, Freidin MB, et al. Real-time tracking of self-reported symptoms to predict potential COVID-19. *Nature Medicine* 2020; 26(7): 1037–40.