



# **A Cross Sectional Study on Awareness and Knowledge of SARS CoV-2 and Vaccination among General Public**

**K. Shailaja<sup>a\*</sup>, S. Benita<sup>a#</sup>, G. Dinesh Kumar<sup>a#</sup>,  
D. Harshidha<sup>a#</sup> and M. V. Mousigan<sup>a#</sup>**

<sup>a</sup> *Department of Pharmacy Practice, C. L. Baid Metha College of Pharmacy, the Tamil Nadu Dr. MGR Medical University, India.*

## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/ACRI/2022/v22i630294

## **Open Peer Review History:**

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/91415>

**Original Research Article**

**Received 14 July 2022**  
**Accepted 03 September 2022**  
**Published 07 September 2022**

## **ABSTRACT**

**Background Information:** COVID-19 is an infectious disease caused by the coronavirus SARS-CoV-2. The WHO declared it a global pandemic on March 12th, 2020. Government initiatives play a major role in limiting the spread of infection by educating people.

**Objectives:** To assess the awareness and knowledge of COVID-19 and vaccination among general public.

**Methodology:** A cross-sectional study as an online survey over a period of 6 months with 601 respondents. The information regarding the demographics was subjected to descriptive analysis. The study was conducted using a pre-tested semi-structured online Google form and a consent form obtained.

**Results:** Among 601 participants, nearly 77% of respondents were practicing preventive measures. Nearly 68% of the respondent's knowledge and awareness about the COVID-19 vaccination was in moderate level.

**Conclusion:** During this pandemic, there were increased worries and apprehensions among the public regarding acquiring the COVID-19 infection. The disease is not eradicated completely, so it

<sup>o</sup> Associate Professor;

<sup>#</sup> Pharm. D Interns;

\*Corresponding author: Email: [shylampharm@gmail.com](mailto:shylampharm@gmail.com), [shailajampharm@gmail.com](mailto:shailajampharm@gmail.com);

is necessary to educate the public continuously. It is not mandatory to stop the awareness-creating program, and advertising about the disease once the severity of the disease is reduced.

**Keywords:** Awareness; COVID-19; knowledge; SARS COV-2; vaccination.

## 1. INTRODUCTION

In the list of pandemics that made people suffer all around the world COVID-19 also found its remarkable place in it. The novel Coronavirus (2019-nCoV, officially known as SARS-CoV-2 or COVID-19) was first reported as a cluster of acute respiratory illnesses in Wuhan, Hubei Province, China in December 2019, from where it spread rapidly to over 230 countries. It was declared a global pandemic on 12th March 2020 by the WHO [1]. Researchers isolated the pneumonia-causing virus in December 2019 and found it to be a strain of  $\beta$ -coronavirus (CoV). The virus shared a high nucleotide sequence homology with two SARS-like bat coronaviruses, bat-SL-CoVZC45 and bat-SL-CoVZXC21 (88 % homology), as well as with SARS-CoV (79.5% homology), but only 50% with the Middle East Respiratory Syndrome Coronavirus (MERS) CoV [2,3]. The virus, now known as SARS-CoV-2, has a single 30 kilobase positive stranded RNA (ribonucleic acid) that encodes for 10 genes [4]. Researchers found that the virus can enter cells through binding to the angiotensin-converting enzyme 2 (ACE2) via the spike protein's receptor binding domain [5]. The virus is responsible for COVID-19. Symptoms include fever, cough, shortness of breath, and lethargy [6,7]. COVID - 19 mortality is higher in those over the age of 65 and in people who have underlying comorbidities such chronic lung disease, severe heart disease, high blood pressure, obesity, and diabetes [8,9]. Antiviral medications, as well as community transmission of the virus, can generate new changes in the virus, resulting in more virulent strains with higher fatality rates or the emergence of treatment-resistant variants [10]. SARS-CoV-2 spread through infected fluids such as respiratory secretions as well as respiratory droplets and saliva, which are expelled during coughing, sneezing, talking, or singing by the infected persons [11,12]. The spread through droplet nuclei (aerosols) that remain infectious when suspended in air over long distances and times is referred to as airborne transmission [13]. SARS-CoV-2 can spread through the air during medical procedures that produce aerosols (also known as "aerosol-generating procedures") [14].

Respiratory droplets or secretions of the infected individuals which expelled can contaminate surfaces and objects, creating fomites (contaminated surfaces). SARS-CoV-2 virus which is viable and/or RNA detected by RT-PCR can be found on those surfaces for periods ranging from hours to days, depending on the environment (including temperature and humidity) and the type of surface there was a large concentration of COVID-19 patients where they were being treated like the healthcare facilities [15].

After all, the tireless efforts of the research technician's vaccine were invented which gave hope to the people. But they have different opinions regarding vaccines. Some of their opinions were misleading which made them suffer.

Several SARS-CoV-2 vaccines have been approved for use in various countries, and more vaccines are being developed. Two vaccines developed in India have been given. Two vaccines manufactured in India have received authorization for emergency use. These were Covishield (created by Oxford-AstraZeneca and produced by Serum Institute of India- SII) and Covaxin [16]. The negligence of people without knowing the seriousness of the pandemic also played a major role in the widespread all around the world. So, the knowledge regarding awareness and its prevention has an intense impact on limiting the spread.

The main purpose of this study is to assess the level of awareness and knowledge concerning COVID-19 and vaccination among general public.

## 2. MATERIALS AND METHODS

**Materials:** Consent Form (English), Google Forms, Answer Feedbacks.

**Methods:**

**Study design:** A cross-sectional study was conducted among the Indian general population. A semi-structured online questionnaire was

developed by using Google forms, with a consent form adjoined to it.

**Study site:** Community-based online survey.

**Study period:** 6 Months (July 2021- December 2021)

**Inclusion criteria:**

1. Individuals of age 18 or greater.
2. General public.
3. The people who are willing to participate in this survey.
4. Those who can read and understand the language (English).
5. Individuals may or may not be affected by COVID - 19.

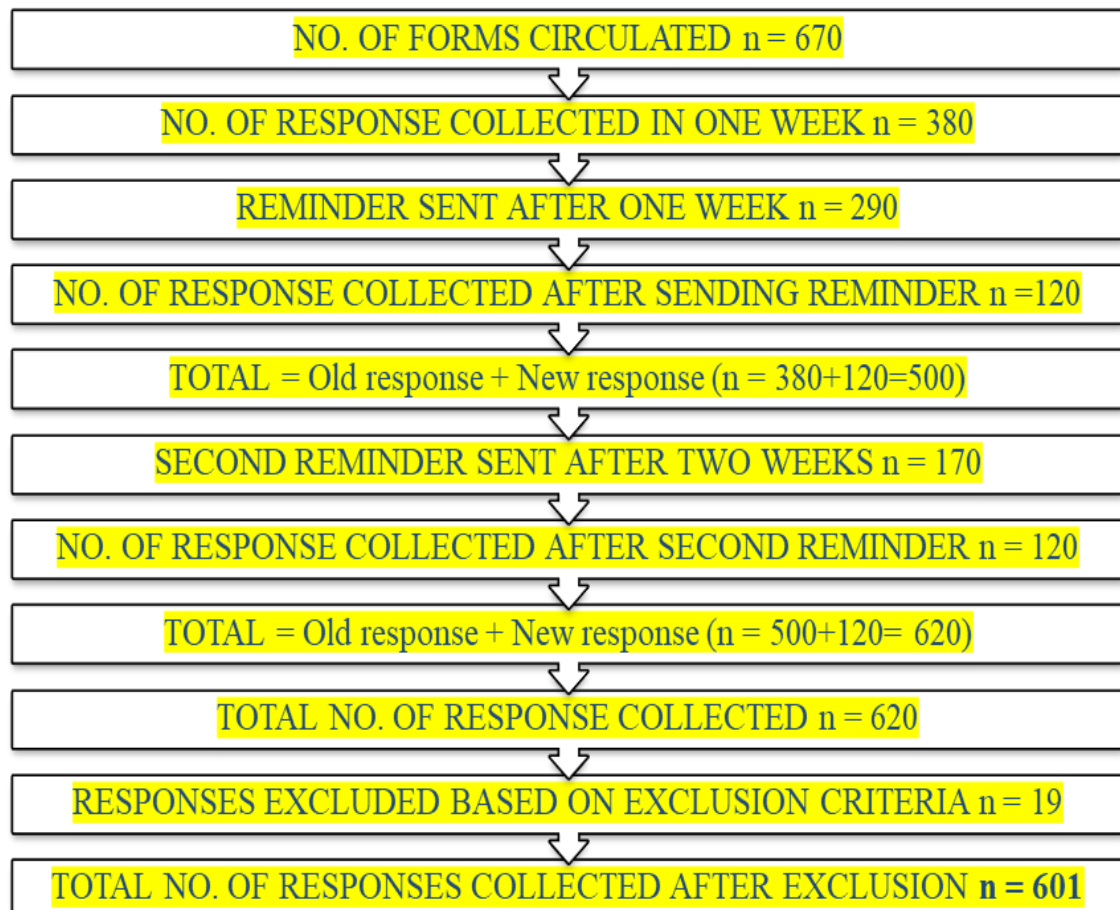
**Exclusion criteria:**

1. People below the age of 18 years.
2. The people who are not willing to participate in this survey.

3. Not able to complete and have difficulty in sending the forms (no proper net connection).

**Questionnaire development:** A self-developed questionnaire was used. The Questionnaire was developed according to the information and guidelines on COVID-19 given by the WHO and the Centers for Disease Control and Prevention (CDC). Readability, feasibility, arrangement, style, and phrase clarity were all taken into consideration while evaluating the face validity of the questionnaire.

**Data collection:** A total of 670 forms were circulated and received a total response of 620 respondents after sending the reminder. The remaining 50 participants were not willing to participate in this study. The reasons for not participating are that they may be busy with their work; some of them maybe felt that responding to a survey through a Google form is not confidential.



**Flow chart for data collection**

**Statistical analysis:** Data were entered into a customized Excel-based system once it is collected. Data on sociodemographic characteristics, medical history, and answers to inquiries about knowledge, perceptions, and attitudes towards the COVID-19 were condensed using descriptive statistical methods. The results were shown as frequencies (n) and percentages (%).

### 3. RESULTS AND DISCUSSION

A total of 601 people participated in this survey. Demographic data, level of education are collected using questionnaire shown in the Table 1 given below.

Almost 87% of the respondents are between the ages of 18 to 30, and 13% of the respondents are over the age of 30. Among the respondents, 54% were females and 46% were males. The respondents were from 28 states or union territories of the country with maximum representation from Tamil Nādu, ensued Kerala, Karnataka, and Andhra Pradesh. More than 60% of the respondents were from the city, nearly 22% were from the town, and 13% were from the village. Almost 76% of the respondents live in nuclear families, and 24% live in joint families. Only respondents in this study who could read and write English and had internet access were surveyed. Therefore, respondents with a higher literacy rate were included in this study. The minimum level of education in this study was SSLC. More than 90% of the respondents were graduates or above. Nearly 15% of the respondents were healthcare professionals who were assisting the public during the pandemic. Since it is an online survey, many of the respondents are not willing to provide information regarding their annual income, medical and social history.

From Table 2, it shows that 72.18% of the respondents were having efficient knowledge about COVID-19 and its vaccination. Only one-fourth of the respondents knew that it was not an airborne infection. People believe that the reason for wearing a mask is to prevent airborne infection, so a clear explanation has to be given regarding the purpose of following the preventive measures while creating awareness. In this study, 25.6% of the study respondents agreed that COVID-19 was not an airborne disease, which was lesser than the study conducted by Arina Anis Azlan et al., among the Malaysian population (43.3%) [17].

The majority of the respondents knew that SARS-CoV-2 is a viral infection. In this study, 93.3% of the study respondents knew the cause of COVID-19, which was lesser than a study conducted by Edris Kakemam et al., among the general population in Iran (94.4%) [18]. From Table 3, 88.2% of the respondents were practicing the preventive measures properly. The rest of the respondents have their own assumptions and lacked in sticking to the proper preventive measures. Governments and healthcare workers play a major role in educating people to follow preventive measures. The majority (55.8%) of the respondents [shown in Fig. 1] were practicing the wrong way of double masking with their own perception due to a lack of awareness. As shown in the Fig. 2, the most common sources of information about COVID-19 were the Internet, followed by mass media, scientific websites, and articles. This pandemic shows that the internet and social media play a major role in everyone's lives. The perception towards vaccination differs between the respondents. In this study, 76% of the respondents preferred the COVISHIELD vaccine, which was higher than the study conducted by Jyoti Jain et al., COVID-19 vaccine hesitancy among medical students in India (45.2%) [19]. Half of the respondents thought that they needed to follow a specific diet. There is no evidence that it is necessary to follow a specific diet after getting the vaccine. The vaccination cycle is not affected by any physiological, endocrine, or immunological factors. The vaccine can be given to women on any day of their menstrual cycle, including period days. Nearly 61% of the respondents consider getting vaccinations during menstruation safe; only 39% of the respondents consider it not safe. Still, there is no evidence to prove that it is not safe to get vaccinations during the days of mensuration. Almost 76% of the respondents felt safe to take the COVID-19 vaccination during pregnancy and breastfeeding. Fear of fever, mistrust, dependence on family members, and lack of awareness are all factors that prevent pregnant and breastfeeding women from getting immunizations. Nearly half of the respondents incorrectly assumed that getting vaccinated against COVID-19 would harm the unborn, believing they were at increased risk. They thought it may cause teratogenicity, birth abnormalities, premature birth, miscarriage, and problems due to maternal antibodies. Frontline workers should emphasis guidance to people regarding vaccination to develop confidence and a hesitant-free vaccination drive. As it was an online survey, most of the people

wouldn't disclose their original attitude towards following the preventive measures that would jeopardize their situation in this pandemic.

**Table 1. Distribution of respondents based on determinants and Sociodemographic Characteristics**

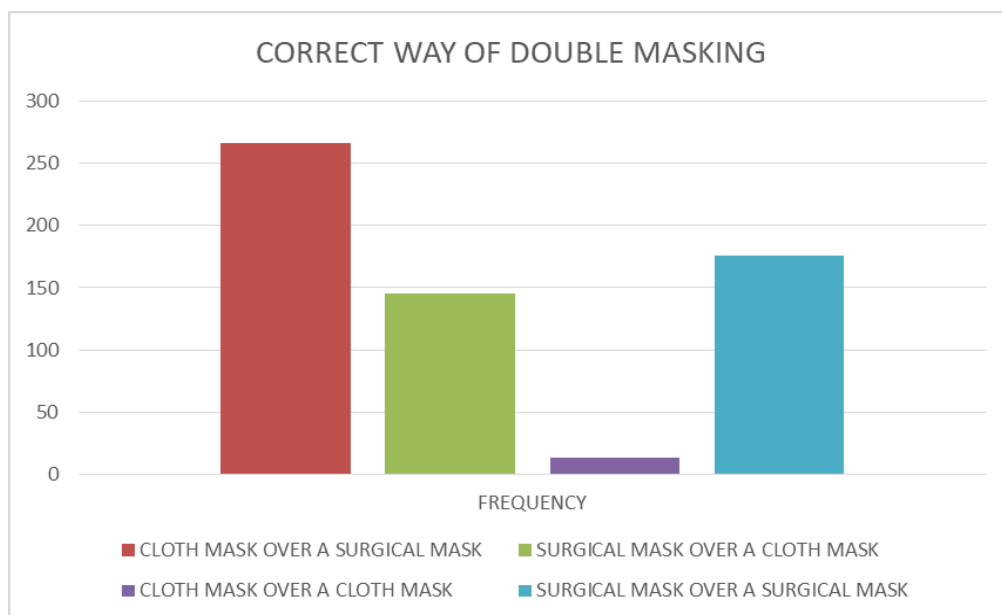
SOCIODEMOGRAPHIC CHARACTERISTICS	NUMBER OF INDIVIDUALS (n=601), n (%)
<b>Age</b>	
18–30	520 (86.5)
31–43	53 (8.8)
44 and above	28 (4.7)
<b>Gender</b>	
Male	276 (45.9)
Female	325 (54.1)
Others	0
<b>State</b>	
Tamil Nadu	562 (93.4)
Kerala	19 (3.2)
Karnataka	9 (1.5)
Andhra Pradesh	5 (0.8)
Tripura	1 (0.2)
Jharkhand	1 (0.2)
Uttar Pradesh	1 (0.2)
Nagaland	1 (0.2)
Maharashtra	2 (0.3)
<b>Locality</b>	
Village	78 (13)
Town	133 (22.1)
City	390 (64.9)
<b>Family type</b>	
Nuclear family	456 (75.9)
Joint family	145 (24.1)
<b>Educational qualification</b>	
Illiterate	0
SSLC	12 (2)
Higher secondary	30 (5)
Undergraduate	389 (64.7)
Postgraduate	163 (27.1)
Ph. D	7 (1.2)
<b>Occupation</b>	
Student	252 (41.9)
Homemaker	30 (5)
Business	29 (4.8)
Teacher	23 (3.8)
Doctor	14 (2.3)
Engineer	81 (13.5)
Police	1 (0.2)
Pharmacist	39 (6.5)
Nurse	31 (5.2)
Unemployed	24 (4)
Retired	1 (0.2)
IT	31 (5.2)
Employee	31 (5.2)
Medical coder	5 (0.8)
Medical services analyst	2 (0.3)
Accountant	2 (0.3)
Lawyer	1 (0.2)
Others	4 (0.6)
<b>Annual Income</b>	
Nil	276 (45.9)
Less than 1 Lakh	73 (12.1)
1 Lakh to 5 Lakh	179 (29.8)
More than 5 Lakh	40 (6.7)
No response	33 (5.5)
<b>Medical History</b>	
Hypertension (BP)	9 (1.5)
Diabetes (Sugar)	10 (1.7)
Hyperlipidemia (cholesterol)	2 (0.3)
None	491 (81.7)
Others	89 (14.8)
<b>Social History</b>	
Alcohol	16 (2.7)
Smoking	8 (1.3)
None	577 (96)

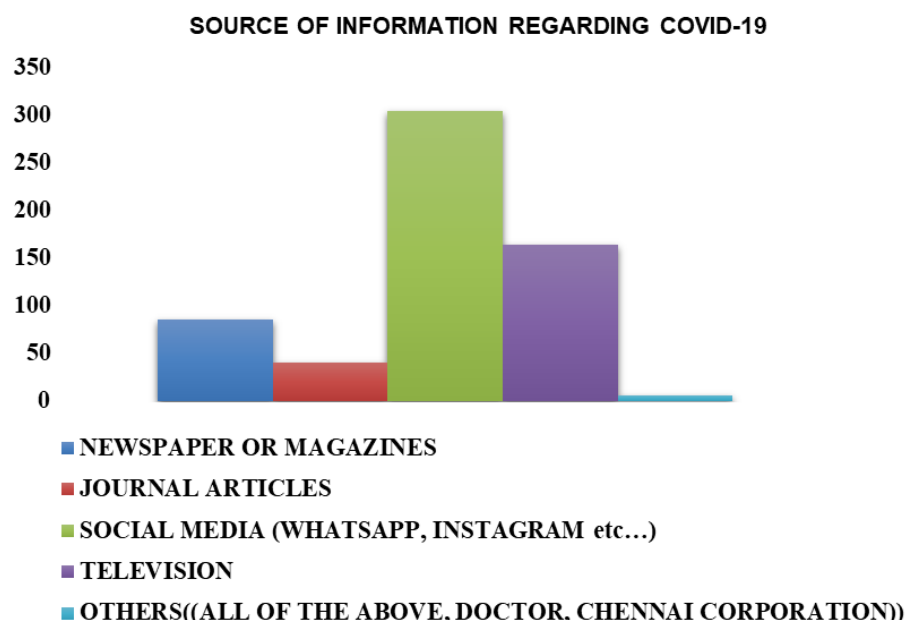
**Table 2. Distribution of responses for the questions related to Awareness and Knowledge of SARS CoV-2 and Vaccination**

S.NO	Questions	Yes	No
		No. (%)	No. (%)
1.	Have you or any known person got infected with COVID-19?	449 (74.8)	152 (25.2)
2.	Is COVID-19 virus An Airborne Infection?	447 (74.4)	154 (25.6)
3.	Can COVID-19 virus spread through the respiratory droplets of infected individuals?	570 (94.8)	31 (5.2)
4.	Are fever, dry cough, tiredness, and shortness of breath the main clinical symptoms of COVID-19?	551 (91.7)	50 (8.3)
5.	Is Delta plus a variant of COVID-19?	552 (91.8)	49 (8.2)
6.	Do you always make sure that you cover your nose, mouth, and chin while wearing mask?	532 (88.5)	69 (11.5)
7.	Are you concerned about any side effects with COVID-19 vaccines?	385 (64.1)	216 (35.9)
8.	Do COVISHIELD and COVAXIN work against the variants of SARS-COV-2?	474 (78.8)	127 (21.2)
9.	Do we need to follow any specific diet after vaccination?	283 (47.1)	318 (52.9)
10.	Is vaccination required for patients recovered from COVID-19?	537 (89.4)	64 (10.6)
11.	Can you get vaccination against COVID-19 during menstruation?	369 (61.4)	232 (38.6)
12.	Is it safe to take COVID-19 Vaccines While Pregnant and Breastfeeding?	455 (75.7)	146 (24.3)
13.	Do you think by vaccinating the pregnant women the child will develop immunity against COVID-19?	359 (59.7)	242 (40.3)
14.	Do you follow other preventive measures even after getting vaccinated?	528 (87.9)	73 (12.1)

**Table 3. Preventive measures against COVID-19 to be followed while going out to the Public Places**

Questions	YES	NO
	No. (%)	No. (%)
Wearing mask	553 (92)	48 (8)
Sanitizing/washing hands promptly	535 (89)	66 (11)
Exposure in Crowding	102 (17)	499 (83)
Touching eyes, nose, and mouth	78 (13)	523 (87)
Maintaining Social distance	541 (90)	60 (10)

**Fig. 1. Distribution of responses for correct way of double masking**



**Fig. 2. Distribution of responses for source of information regarding COVID-19**

## 4. CONCLUSION

During this coronavirus pandemic, most healthcare professionals and people who are educated were aware of this infection, possible preventive measures, the social distancing importance, and initiatives taken by the government to limit the spread of infection. However, there are increased worries and apprehensions among the public regarding acquiring the COVID-19 infection. The disease is not eradicated completely, hence it is necessary to educate the public continuously as well as healthcare professionals through a Continuous Medical Education Program. Once the severity of the disease is reduced, it is not mandatory to stop the awareness creating program or advertising about the disease. Negligence is the major illness of human beings, so it is necessary to continuously remind people about the seriousness of the disease and the importance of following preventive measures.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

## ACKNOWLEDGEMENTS

We authors would like to thank C.L. Baid Metha College of Pharmacy and our honorable Principal Dr. Grace Rathnam M. Pharm Ph. D for providing us with all the necessary facilities to carry out this work. No funding was received for the work.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Coronavirus disease (COVID-19). Situation Report – 124. Geneva: World Health Organization;2020. Available:[https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200523-covid-19-sitrep-124.pdf?sfvrsn=9626d639\\_2](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200523-covid-19-sitrep-124.pdf?sfvrsn=9626d639_2) [cited 2020 28 May].
2. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, et al. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *Lancet*. 2020 02 22;395 (10224):565–74. DOI: [http://dx.doi.org/10.1016/S0140-6736\(20\)30251-8](http://dx.doi.org/10.1016/S0140-6736(20)30251-8) PMID: 32007145
3. Wu F, Zhao S, Yu B, Chen Y-M, Wang W, Song ZG, et al. A new coronavirus associated with human respiratory disease in China. *Nature*. 2020;579(7798):265–9.

- DOI: <http://dx.doi.org/10.1038/s41586-020-2008-3> PMID: 32015508
4. Wuhan seafood market pneumonia virus isolate Wuhan-Hu-1, complete genome. NCBI Reference Sequence: NC\_045512.1. Bethesda: National Center for Biotechnology Information; 2020. Available from: [https://www.ncbi.nlm.nih.gov/nucleotide/NC\\_045512.1](https://www.ncbi.nlm.nih.gov/nucleotide/NC_045512.1) [cited 2020 May 29].
5. Hoffmann M, Kleine-Weber H, Schroeder S, Krüger N, Herrler T, Erichsen S, et al. SARS-CoV-2 Cell Entry Depends on ACE2 and TMPRSS2 and Is Blocked by a Clinically Proven Protease Inhibitor. *Cell*. 2020;181(2):271–280.e8. DOI: <http://dx.doi.org/10.1016/j.cell.2020.02.052> PMID: 32142651
6. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China: JAMA; 2020. DOI: <http://dx.doi.org/10.1001/jama.2020.1585>
7. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al.; China Medical Treatment Expert Group for Covid-19. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med*. 2020 04 30;382(18):1708–20. DOI: <http://dx.doi.org/10.1056/NEJMoa2002032> PMID: 32109013.
8. Richardson S, Hirsch JS, Narasimhan M, Crawford JM, McGinn T, Davidson KW, et al.; and the Northwell COVID-19 Research Consortium. Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York city area. *JAMA*. 2020 Apr 22. Epub ahead of print. DOI: <http://dx.doi.org/10.1001/jama.2020.6775> PMID: 32320003
9. Yang X, Yu Y, Xu J, Shu H, Xia J, Liu H, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med*. 2020;5(5):475–81. DOI: [http://dx.doi.org/10.1016/S2213-2600\(20\)30079-5](http://dx.doi.org/10.1016/S2213-2600(20)30079-5) PMID: 32105632
10. Sanjuán R, Domingo-Calap P. Mechanisms of viral mutation. *Cell Mol Life Sci*. 2016;73(23):4433–48. DOI: <http://dx.doi.org/10.1007/s00018-016-2299-6> PMID: 27392606
11. Liu J, Liao X, Qian S, Yuan J, Wang F, Liu Y, et al. Community Transmission of Severe Acute Respiratory Syndrome Coronavirus 2, Shenzhen, China, 2020. *Emerg Infect Dis*. 2020;26:1320-3.
12. Luo L, Liu D, Liao X, Wu X, Jing Q, Zheng J, et al. Modes of contact and risk of transmission in COVID-19 among close contacts (pre-print). *MedRxiv*. 2020. DOI:10.1101/2020.03.24.20042606.
13. Infection Prevention and Control of Epidemic-and Pandemic-prone Acute Respiratory Infections in Health Care. Geneva: World Health Organization; 2014 (available at [https://apps.who.int/iris/bitstream/handle/10665/112656/9789241507134\\_eng.pdf;jsessionid=41AA684FB64571CE8D8A453C4F2B2096?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/112656/9789241507134_eng.pdf;jsessionid=41AA684FB64571CE8D8A453C4F2B2096?sequence=1))
14. Advice on the use of masks in the context of COVID-19. Interim guidance. Geneva: World Health Organization; 2020 (available at [https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-\(2019-ncov\)-outbreak](https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak)).
15. Transmission of SARS-CoV-2: implications for infection prevention precautions [Internet]. Who.int. [cited 2022 Aug 29]. Available: <https://www.who.int/news-room/commentaries/detail/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions> Available from: <https://www.who.int/news-room/commentaries/detail/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions>.
16. Kumar VM, Pandi-Perumal SR, Trakht I, Thyagarajan SP. Strategy for COVID-19 vaccination in India: the country with the second highest population and number of cases. *NPJ Vaccines*. 2021;6(1):60.
17. Azlan AA, Hamzah MR, Sern TJ, Ayub SH, Mohamad E. Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *PLoS One* [Internet]. 2020;15(5):e0233668. Available: <http://dx.doi.org/10.1371/journal.pone.0233668>
18. Kakemam E, Ghoddoosi-Nejad D, Chegini Z, Momeni K, Salehiniya H, Hassanipour S, et al. Knowledge, attitudes, and practices among the general population during COVID-19 outbreak in Iran: A national cross-sectional online survey.



- Front Public Health [Internet]. 2020;8:585302.  
Available: <http://dx.doi.org/10.3389/fpubh.2020.585302>
19. Jain J, Saurabh S, Kumar P, Verma MK, Goel AD, Gupta MK, et al. COVID-19 vaccine hesitancy among medical students in India. *Epidemiol Infect* [Internet]. 2021 [cited 2022 Jul 12];149 (e132):e132.  
Available: <http://dx.doi.org/10.1017/S0950268821001205>

© 2022 Shailaja et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*

<https://www.sdiarticle5.com/review-history/91415>