



Comparative Study on SARS-CoV-2 Variants

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ABSTRACT

Viruses have spent billions of years perfecting the art of surviving without living, a frighteningly effective strategy that makes them a potent threat in today's world. But as soon as it gets into a human airway, the virus hijacks our cells to create millions more versions of itself. That's especially true of the deadly new coronavirus that has brought global society to a screeching halt. It's little more than a packet of genetic material surrounded by a spiky protein shell one-thousandth the width of an eyelash, and it leads such a zombielike existence that it's barely considered a living organism. A comparative research study survey on Male and Female Post Graduate of Chemistry residing in Mumbai and its suburbs was conducted to find out their awareness regarding SARS-CoV-2 virus and its variants.

In the research study survey, it was found that students were not fully aware of the situation and the various factors associated with SARS-CoV-2 and its variants. There is an urgent need to make people educate on this matter so that if and when the next pandemic occurs we should know our way out.

Keywords: SARS-CoV-2 variants, research study, VOI, VOC

1. INTRODUCTION:

A comprehensive literature review identifies 1415 species of infectious organism known to be pathogenic to humans. Out of these, 868 (61%) are zoonotic, that is, they can be transmitted between humans and animals. Viruses much like this one has been responsible for many of the most destructive outbreaks of the past 100 years: the flus of 1918, 1957 and 1968; and SARS, MERS and Ebola. Like the coronavirus, all these diseases are zoonotic — they jumped from an animal population into humans. And all are caused by viruses that encode their genetic material in RNA. The zombielike existence of RNA viruses makes them easy to catch and hard to kill. Outside a host, viruses are dormant. They have none of the traditional trappings of life: metabolism, motion, the ability. When viruses encounter a host, they use proteins on their surfaces to

unlock and invade its unsuspecting cells. Then they take control of those cells' molecular machinery to produce and assemble the materials needed for more viruses.

Among RNA viruses, coronaviruses — named for the protein spikes that adorn them like points of a crown — are unique for their size and relative sophistication.

Respiratory viruses tend to infect and replicate in two places: In the nose and throat, where they are highly contagious, or lower in the lungs, where they spread less easily but are much deadlier.

Viruses mutate over time to adapt to their environment and improve their survival. Within the passage of a year, December 2020 saw the emergence of changing SARS-COV-2 variants. These changes in variations allow the virus to be more contagious than before. Over the course of the pandemic, SARS-CoV-2, the novel coronavirus that

causes SARS-COV-2, has mutated enough to change both its ability to spread through the population and its ability to infect people.

These new strains are called variants. The U.S. Centres for Disease Control and Prevention currently classifies variants into three categories.

- **Variant of Interest (VOI):** The world health body further confirmed that a VOI causes a consequential volume of community transmission. A global increase in cases poses a risk of large proportions to worldwide public health.
- **Variant of Concern (VOC):** They are less responsive to treatments or vaccines and more likely to evade diagnostic detection. They tend to be more transmissible, or contagious, and result in more severe infections. Alpha and delta are VOCs.
- **Variant Under Monitoring (VUM):** Variant under monitoring might result as Variant of Concern depending on its transmission rate and various other parameters. Example Omicron.

WHO label	Earliest documented samples	Date of designation
Alpha	United Kingdom, Sep -2020	18 th Dec 2020
Beta	South Africa, May-2020	18 th Dec 2020
Gamma	Brazil, November -2020	11 th Jan 2021
Delta	India, Oct -2020	VOI:4 th April 2021 VOC:11 th May 2021
Omicron	Multiple countries, Nov-2021	VUM:24 th Nov 2021 VOC:26 th Nov 2021

Variant under Monitoring: VUM, Variant of Interest: VOI, Variant of Concern: VOC

2. Objective of the study: This research study survey was conducted on Male and Female Post-Graduate students of Chemistry residing in Mumbai and its suburbs to observe their awareness regarding various SARS-CoV-2 variants.

3. Methodology: The Online survey was conducted in February 2022. A google form questionnaire was developed, which included two main sections. The first section(A) includes socio-demographic characteristics to collect basic information about the participants. The second section(B) consisted of the questions which were related to the survey. The participants were randomly selected using the snowball sampling technique⁸. In total, 17 & 31 online questionnaires of each category were collected.

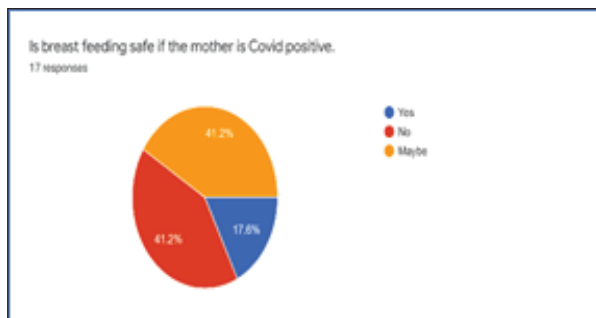
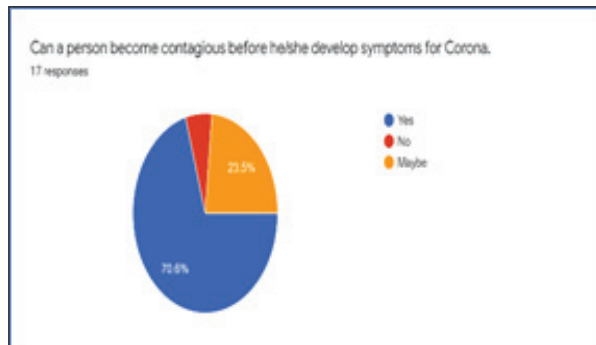
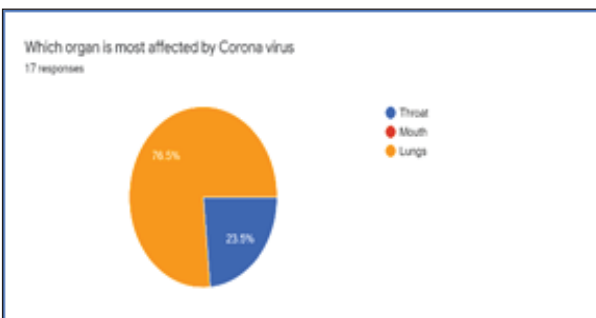
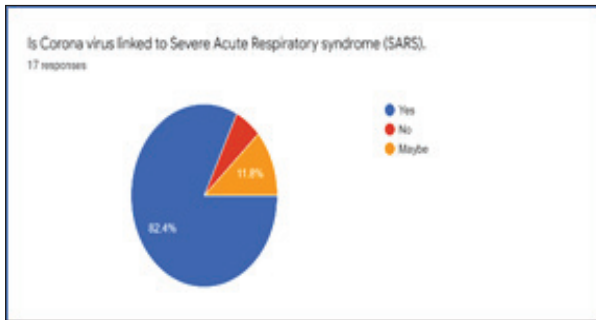
Variable	Category	N	%
Age	21-22	10	58.8
	23-24	07	41.2
Variable	Category	N	%
	Female		
Age	21-22	21	67.7
	23-24	10	31.4

Section A Questions included in the questionnaire wherein participant was requested to fill. The summarization is as follows:

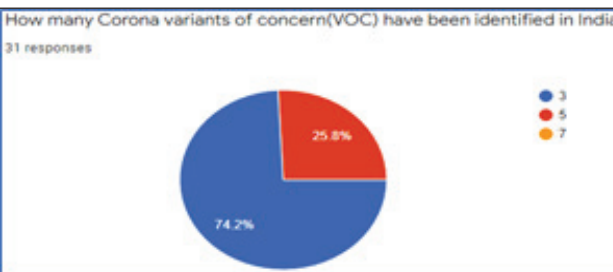
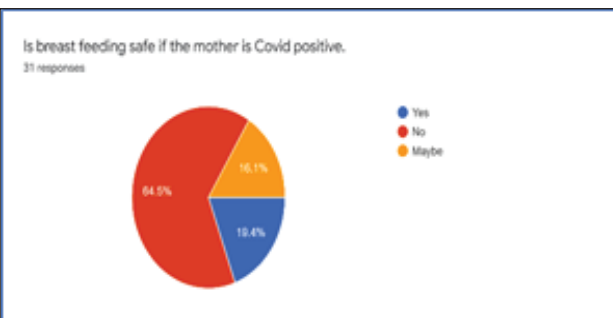
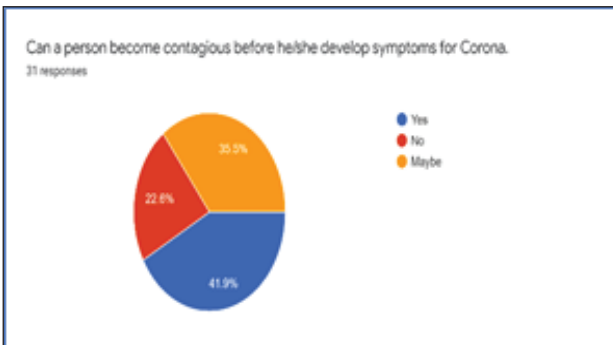
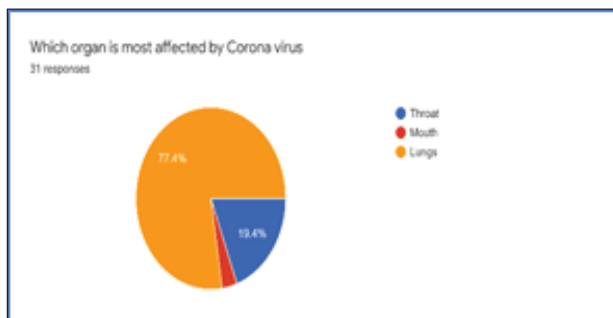
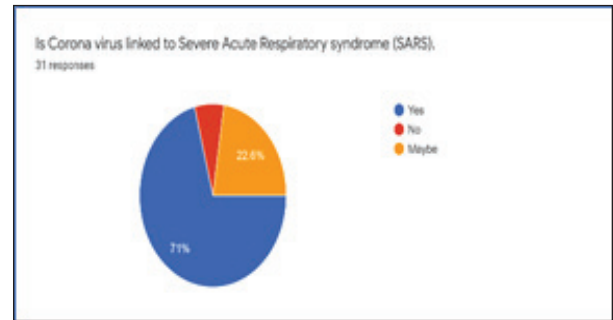
	Yes	No	Maybe
Is SARS-CoV-2 virus linked to severe acute respiratory syndrome (SARS).			
Males	14	01	02
Females	22	02	07
Which organ is most affected by SARS-CoV-2 virus	Throat	Mouth	Lungs
Males	04	-	13
Females	06	01	24
Can a person become contagious before he/she develop symptoms for Corona?	Yes	No	Maybe
Males	12	01	04
Females	13	07	11
Is breast feeding safe if the mother is Covid positive.	Yes	No	Maybe
Males	03	07	07
Females	06	20	05
How many SARS-CoV-2 variants of concern(VOC) have been identified in India.	03	05	07
Males	12	05	-
Females	12	09	10
Omicron spread faster than the original SARS-CoV-2 strain of the virus	Yes	No	Maybe
Males	08	07	02
Females	20	02	09

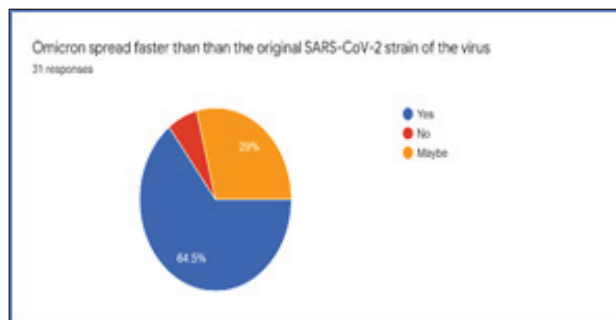
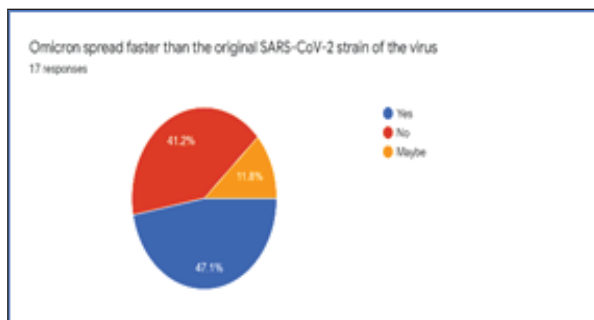
Section (B) Charts & Graphs

Male Response



Female Response





4.RESULTS &DISCUSSIONS:

As seen from the survey results male participants (82%) were more aware of the link SARS-CoV-2 virus to SARS as compared to female participants (71%). of both the genders (around 77%) were sure that the virus affects the lungs. Regarding the asymptomatic nature of the virus, male participants (70.6%) were more aware that the affected person will transfer the virus as compared to their female counterparts(42%).Female participants were more confident that a Covid positive mother can breast feed her child while taking proper precautions as compared to male participants. None of the participants were able to give the positive response for the SARS-CoV-2 -19 variants found in India. Regarding the latest variant Omicron, only 47% of male participants were aware that it is more contagious than the original SARS-CoV-2 virus strain, however 65%of the female participants replied positively for the same.

5.CONCLUSION:

Technology cannot prevent the onset of the pandemics; however, it can help prevent the spread, educate the public and noticeably lessen the impact. From the research survey results it can be clearly felt that more awareness is required regarding SARS-CoV-2 virus. If the awareness of the Science stream students is so low, what about the common man. We don't know when and where the next pandemic will start. Pathogens does not follow any boundary the whole world became its playground in the globalized network of trade and travel.

The only way out is maximum awareness and taking appropriate steps in the same direction. SARS-CoV-2 virus and its variants have made us aware of our vulnerability life style habits now have to be reset for our survival in the future which is full of uncertainties. We all have to be responsible not just for ourselves but for the society as a whole.

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Declaration: *We also declare that all ethical guidelines have been followed during this work and there is no conflict of interest among authors.*

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