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Public perceptions and experiences with the ongoing COVID-19 immunisation programme in India: A survey-based study

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ABSTRACT

In countries with large population size, the process of spreading awareness about an entity is often a challenging task. India, ranking second in the world in terms of population, was one of the countries to produce effective vaccines and run a vaccination campaign in a span of months after the onset of COVID-19. The main objectives of the survey were to uncover the predilection of individuals regarding the available vaccines, the extent of safety and the necessity of vaccines. An attempt was made to find out the post-vaccination manifestations. The questionnaire was designed using Google forms which had a total of 31 questions and was circulated via various social media platforms. By the time of conduction of the survey, 18.40% of individuals had received both doses of vaccines and 58.10% of individuals had pain at the site of injection as the most common symptom irrespective of the type of vaccine they received. It can be concluded that the majority of individuals considered vaccination as the need of the hour. Covishield was the most favoured vaccine. Although most of the responses received were assertive, some of the respondents were still sceptical about the vaccination. It was found that vaccination helped in reducing the severity of disease and if coupled with other precautionary measures will lessen the transmission or spread of the virus.

KEYWORDS: COVID-19, SARS-CoV-2, Symptoms, Vaccination, Vaccines

Introduction

On 31 December 2019, a case of pneumonia-like disease was observed in Wuhan, a city in China, but the cause of the disease

was not known. A virus named '*novel coronavirus*' was declared the cause of the disease by the Chinese on 7 January 2020 (Kaur and Gupta, 2020). The coronaviruses are not new to the world, they have led to various outbreaks of diseases in the past decades along with the outbreak of SARS-CoV-2 recently in later months of 2019 (De Wit *et al*., 2016; Tse *et al*., 2020). Due to the abrupt transmission of this viral disease all over the world, WHO (World Health Organization), on 30 January 2020, declared a Public Health Emergency of International Concern, and on 11 March 2020, a Global Pandemic. SARS-CoV-2 is a virus which affects the respiratory tract leading to severe pneumonia and may even lead to death.

The diagnosis of the disease is done by performing antibody tests, rapid antigen tests, Reverse transcription-quantitative PCR (RT-qPCR) based tests along with CT scans that are found to be comparatively more reliable due to their high sensitivity (Ong *et al*., 2020). There were not any vaccines which were efficacious against this COVID-19 viral disease, so there was an urgent need to develop effective and shielded vaccines which could prevent people from getting severely infected by the virus. Vaccines are the weakened or completely inactivated forms of the actual disease-causing virus or bacteria (whole pathogenic organism or a pathogenic part of the organism like mRNA, DNA or protein) designed to generate an immune response in the host body. As the process of vaccination builds immunity against the disease or disease-causing organisms, it is also referred to as 'immunization' (Iwasaki and Omer, 2020). Many countries have introduced different kinds of effective vaccines to the world. Some of which are Covaxin, Covishield, Sputnik V, Pfizer, etc. However, the questions regarding the effectiveness of these vaccines are yet not clear and clinical trials are being carried out by the researchers constantly (https://www.cdc.gov/coronavirus/ 2019-ncov/science/science-briefs/fully-vaccinated-people.html).

National Expert Group on Vaccine Administration for COVID-19 (NEGVAC) is authorised by the Government of India (GOI) and provides all kinds of guidelines related to COVID-19 vaccines being administered in the country. The vaccination drive commenced in our country in phases. The first phase started on 16 January 2021, with only two approved

vaccines i.e. Covishield and Covaxin. In this phase, vaccines were given to the frontline workers, healthcare workers, and individuals who were 50 years old or above and those who were less than 50 years but were having health problems like chronic heart diseases, HIV, hypertension, cancer, etc. (https://www.mohfw.gov.in/pdf/LiberalisedPricingandAccelerate dNationalCovid19VaccinationStrategy2042021.pdf).

The second phase started on 1 April 2021 and all the individuals of age group 60 years or above and individuals older than 45 years along with the ones with co-morbidities were eligible. The third phase on 1 May 2021 and individuals around 18 years and above were considered eligible for vaccination (https://www.mohfw.gov.in/covid_vaccination/vaccination/faqs. html#who-will-get-the-vaccine). Some coherent digital platforms like Co-WIN were also introduced to make the process contented and systematic (Kumar *et al*., 2021). There are various studies which reveal the positive attitude of public towards COVID-19 vaccine (Syed Alwi *et al*., 2021; Islam *et al*., 2021b; Kumar *et al*., 2021). In a survey conducted in India by Kishore *et al.* (2021), 70.44% respondents showed interest in getting immunised. In another study conducted by Godasi *et al.*, 2021 showed that 69% of participants were ready to take the COVID-19 vaccine and employing different stakeholders would help in overcoming hesitancy and developing positive outlook towards COVID-19 vaccines (Godasi *et al*., 2021). In survey conducted by Syan *et al.* (2021) in Ontario, 82.8% of participants showed eagerness to receive the vaccine (Syan *et al*., 2021).

The most common reasons reported for the hesitance towards vaccines were like long-term or immediate symptoms of the vaccine, as well as lack of confidence in the vaccines (Syan *et al*., The misconceptions regarding the vaccination formed a barrier in the vaccination drive apart from the wastage of doses (Pandey *et al*., 2021) and the low production of vaccines.

The survey was done to assess the awareness and experiences of the general public with the ongoing COVID-19 vaccination drive in the country. It also aims to provide a platform for people to share their opinions on this subject.

Research Methodology

An online survey-based study was conducted by students of Gargi College, University of Delhi, New Delhi. Data for this study was collected using Google Forms which was sent via social media platforms, and individuals were requested to share their experiences and views on the 'COVID-19 Vaccination Drive 'carried out in the country. The responses received from the participants were kept anonymous and used for analysis purposes only.

Questions in the Google Form were finalised upon mutual consent of the teammates and teachers. It had a total of 31 questions and initial questions were related to the personal information of the respondent that was not made mandatory to answer while the rest of the questions were based on the chief objective of the survey.

Results and Analysis

Socio-demographic physiognomies

In total, 515 respondents across 26 states and 3 Union Territories of the country answered the questionnaire (Table 1). A maximum of about 31.07% of responses were received from Haryana followed by 20.29%) from Delhi. Out of those, 70.70% of responses were from females, 29.10% from males and the rest didn't prefer to disclose their gender. The majority of respondents (90%) belonged to the age group ranging from 18-44 years old and only 10% were from the 45+ age group. Participants appertained to various educational backgrounds, 49.13% were found to be graduates, 21.17% postgraduates, 20.19% from 12th standard, 7.57% were PhDs and the rest 1.94% were from other backgrounds such as a lawyer, chartered accountant, dentist, General Nursing and Midwifery (GNM) and other faculties (Table 2).

Table 1: Geographic locations of respondents in India

States	Percentage (%)
Andhra Pradesh	0.19
Arunachal Pradesh	0.39
Assam	0.78
Bihar	3.50

Chandigarh	0.19
Chhattisgarh	0.39
Goa	0.19
Gujarat	0.19
Haryana	31.07
Himachal Pradesh	0.39
Jammu & Kashmir	1.17
Jharkhand	1.36
Karnataka	0.58
Madhya Pradesh	3.11
Maharashtra	1.36
Manipur	0.39
Meghalaya	0.19
Mizoram	0.19
Delhi	20.19
Orissa	0.78
Punjab	1.75
Rajasthan	13.20
Sikkim	0.19
Tamil Nadu	0.39
Telangana	0.39
Tripura	0.19
Uttar Pradesh	14.37
Uttarakhand	1.55
West Bengal	1.17

Table 2: Socio-demographic details of respondents

Variables	Percentage (%)
Gender	
Male	29.10
Female	70.70
Prefer not to say	0.20
Age	
18-44	90.00
45+	10.00
Education	
12th	20.19
Graduate	49.13
Post-graduate	21.17
PhD	7.57
Other	1.94

Vaccines: their inevitability and safety

Respondents were asked to give their views on the necessity of getting vaccinated, and whether they felt safe about getting themselves as well as their children in getting vaccinated. About 96.50% of participants agreed that vaccination is necessary for protection against the SARS-CoV-2 virus, only 1% of respondents didn't want to take the vaccine and 2.50% of individuals were not sure about the vaccination. The vast majority of people 90.10% felt safe in getting vaccinated, 1.90% didn't feel the same, most of them were in the 18-44 age group and 8% of respondents were not sure if the vaccines are safe. After the vaccination protocols for the 18+ age groups were released, it was important to know whether parents felt safe about their child getting vaccinated 66.40% of people felt safe about this while 3.90% didn't feel safe for their child getting vaccinated and 29.70% were not sure about it (Table 3).

Table 3: Necessity and safety of vaccines

Questions asked from respondents	Percentage of responses (%)		
	Yes	**No**	**Can't say**
Do you think vaccination is necessary?	96.50	1.00	2.50
Do you feel safe getting vaccinated?	90.10	1.90	8.00
Do you think that it will be safe to get your child vaccinated?	66.40	3.90	29.70

Preference for vaccines and the time gap between both the doses

During this pandemic, several companies across the world tried to prepare vaccines. So, people were asked to reveal the number and name of vaccines they knew. It was surprising to know that 53.20% of people could name more than 3 vaccines, 32.20% of individuals could name at least 3, 12.40% of respondents knew at least 2 and only 2.10% knew only one (Figure 1A).

Of the three vaccines (Covaxin, Covishield and Sputnik V), 57.10% of respondents preferred the Covishield vaccine, 26.40% people chose the Covaxin vaccine and rest, 16.50% favoured the Sputnik V vaccine (Figure 1B).

As per the present analysis, only 18.40% of the respondents were found to be fully vaccinated, 59.60% were partially vaccinated and 21.90% were yet to receive the vaccine (Figure 1C). The majority of participants (88%) encouraged other people to take up the vaccines (Figure 1D).

The next question asked was regarding the time gap between dose 1 and dose 2. 57.30% of respondents believed that the time gap between dose 1 and dose 2 vaccine is sufficient, 181 people (35.10%) wanted it to be decreased while only 7.60% individuals wanted it to be increased (Figure 1E). Respondents were also asked if vaccination was enough to protect the people from COVID-19. To this question, 60.80% of people gave a negative response, 18.40% of participants replied yes and 20.80% of respondents were not sure about it (Figure 1F).
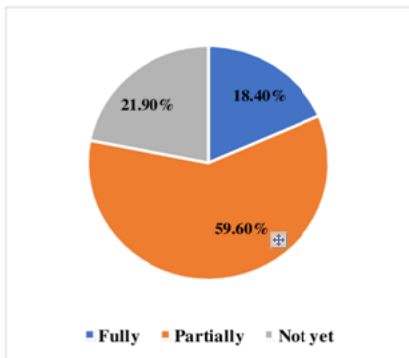
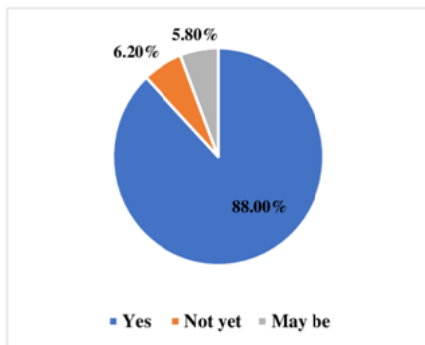**A. How many vaccines can you name for COVID-19?**
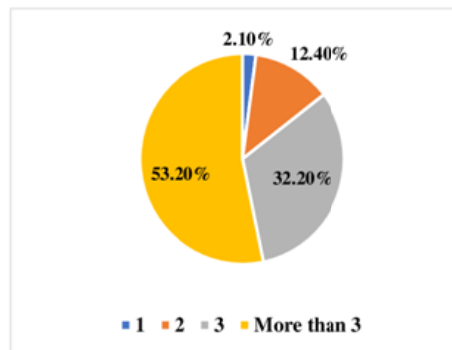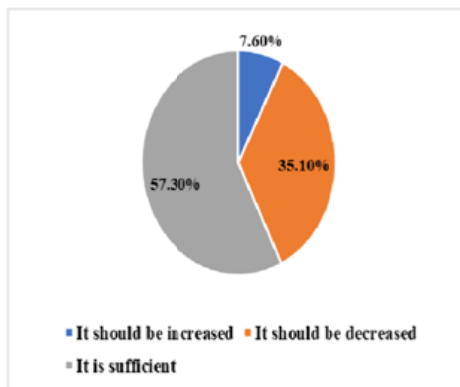

B. Which vaccine do you prefer?
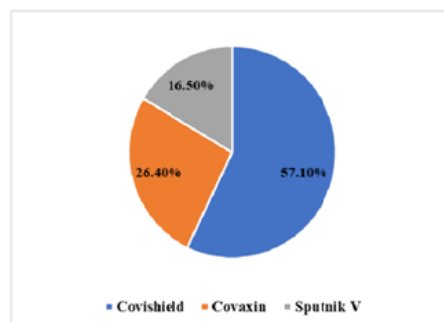
C. Are you vaccinated?

D. Have you encouraged other people for getting vaccinated?

E. What do you think about the time gap between dose 1 and dose 2?

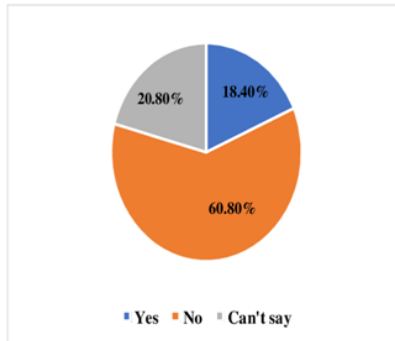**F. Do you think vaccination is enough to protect us from COVID-19?**

Figure 1. Data regarding vaccination, preference of vaccines and time gap between both the doses

Non-vaccinated respondents' reasons for not getting vaccinated

COVID-19 vaccine is considered to be a fairly protective measure against the disease and yet some of the respondents were not vaccinated or were partially vaccinated when the survey was conducted. Many reasons were stated by the respondents such as 5.24% of individuals revealed that since they got infected with COVID-19 they could not take up the vaccine, 5.24% of individuals faced a shortage of vaccines, 4.07% people were not able to book the slots, 4.08% individuals were waiting to get the second dose of vaccination, 0.97% individuals were hesitant in getting vaccinated and 2.25% individuals mentioned other reasons like some were lactating mothers and during the time of the conduction of survey, lactating mothers were not eligible for the same, some of them wanted to get their body check-up done before getting vaccinated, some of them were waiting for Sputnik V vaccine, etc. (Figure 2). Rest 78.15% were fully vaccinated hence, did not comment on this question in our survey.

COVID-19 protocol followers

The GOI released mandatory vaccination protocols to be followed at the vaccination centre. The current study showed that 65.20% of respondents were satisfied with the protocols followed at the vaccination centre and about 19.40% didn't
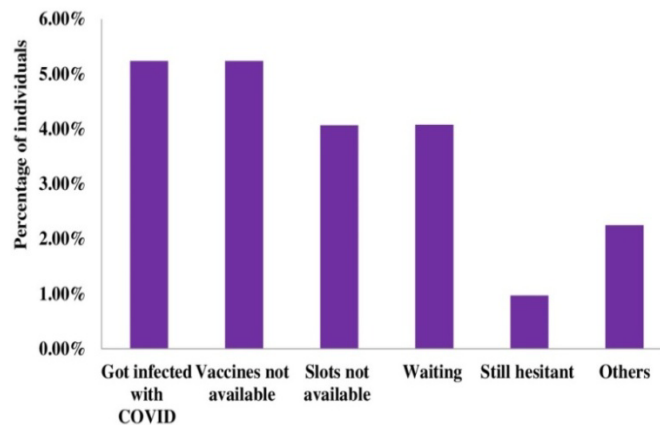
Figure 2. Reasons given by non-vaccinated respondents for not getting vaccinated

notice, so were uncertain. Rest 15.30% gave a negative response and were not happy as the protocols were not being properly followed by others at the centre. The majority of participants 95.30% felt that wearing mask and maintaining social distancing norms are necessary even after vaccination. On the other hand, some (3.90%) of them still weren't sure and 0.80% people stated that the guidelines were not implemented (Figure 3).

According to protocols enlisted by the GOI, each and every vaccination centre is advised to keep a note of symptoms for about 30 minutes post-vaccination to check if the person develops anaphylaxis. As per this survey, 65% of people were asked to wait, 21.40% of participants were not and 13.60% of individuals couldn't comment on this (Figure 3). Similarly, vaccination centres are not supposed to charge beneficiaries for vaccines; nonetheless, 77.10% of individuals stated that they were not charged for vaccines but on the contrary, 11.80% reported that they were asked to pay for the vaccines. (Figure 3).

On examining whether precautionary measures were taken during vaccination such as the use of a fresh syringe, its safe waste disposal and acknowledgement certificate post-vaccination, 82.10% of the respondents replied that a fresh syringe was used for their vaccination and 17.90% didn't
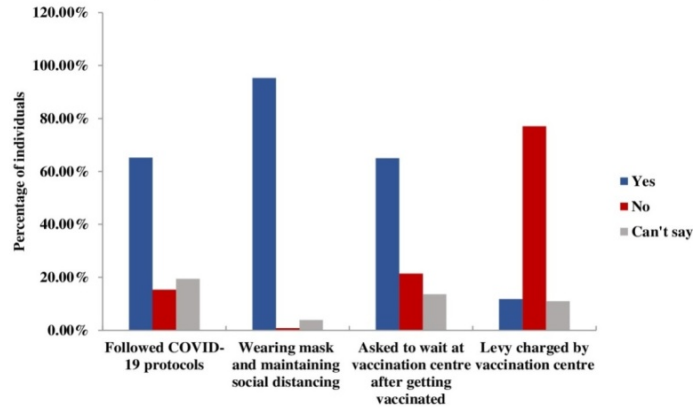
Figure 3. Graphical representation of individual responses to various COVID-19 immunisation procedures followed by vaccination centres

notice. On being asked about the proper disposal of syringe by the vaccination centre, 74.40% of participants gave an affirmative answer, 0.60% people gave a negative reply and the remaining 25% were not certain. After a person gets vaccinated, he/she is provided with an acknowledgement certificate by the government carrying both beneficiary and vaccination details. Out of the total respondents, 66% received an acknowledgement certificate post-vaccination, 16.90% couldn't tell and interestingly, 17.10% did not receive any receipt (Figure 4).
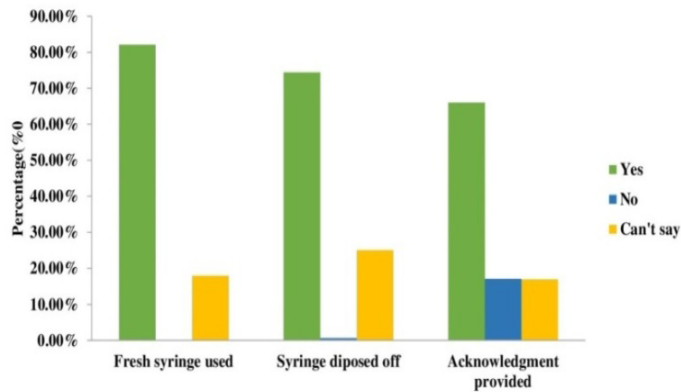

Figure 4. Data on the use of new syringes, their disposal, and post-vaccination acknowledgement

Medical history and post-vaccination symptoms

The current study also analysed the post-vaccination associated symptoms observed in the vaccinated respondents. About 10.50% didn't experience any symptoms and 15.90% couldn't tell. Those who developed symptoms either experienced any one symptom or multiple symptoms simultaneously. The majority of respondents (58.10%) revealed that they had pain at the site of injection followed by fever (45.20%) and body ache (42.30%). The other symptoms stated by respondents were headache (29.30%), drowsiness (14.80%), nausea (7%) and chills (10.10%). Apart from this, few people (3.7%) reported distinct symptoms such as high blood pressure, diarrhoea and other kinds of symptoms. 0.6% of those attempting the question were not vaccinated yet (Figure 5).
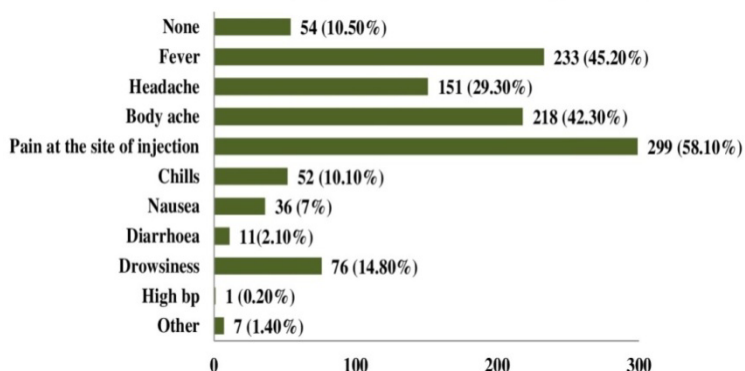

Figure 5. Post-vaccination symptoms exhibited by vaccinated individuals

The above-mentioned post-vaccination symptoms such as fever, headache and body ache, nausea, pain at the site of injection, chills, high blood pressure, etc. lasted for 1 day in 24.10% of respondents, for 2 days in 40% individuals, and more than 2 days in 13.40%. 22.50% of respondents could not mention the exact number of days the symptoms lasted (Figure 6).

The intricacies in the vaccinated individuals who had some medical history were also analysed. In the current survey, only 10.30% of respondents had a medical history (Figure 7A) and out of those, 61.90% of the respondents did not experience any kind of symptoms while 32.50% weren't sure of this and only a minority of about 5.60% experienced complications (Figure 7B).
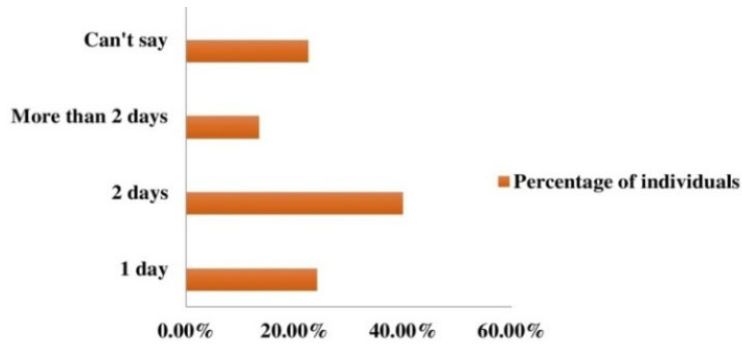
Figure 6. Data depicting the duration of the post-vaccination symptoms

Booking vaccination slots wasn't an easy task. This has been confirmed by about 45.60% of the respondents. Though 44.10% found it easy for them to book, and rest 10.30% were not sure about it.
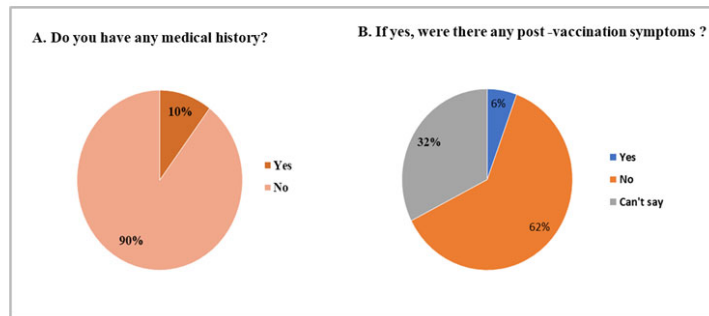

Figure 7. Data regarding the development of symptoms in people with comorbidities

Post-vaccination SARS-CoV-2 viral infection and associated symptoms

On being asked whether they knew anyone who got infected with the SARS-CoV-2 virus even after getting vaccinated, 32.80% responded negatively. Among those who responded yes, 31.80% of individuals reported having known at least one person who got infected after the first vaccination dose while 16.30% of

respondents revealed that they knew people who got infected even after both doses of vaccination. 8.90% of respondents reported having known even more than one such case who got infected either after getting the first dose or second dose and 10.10% were unsure (Figure 8A). When asked about the severity of disease in patients who became infected with COVID-19 after being vaccinated, 58.80% of respondents confirmed that those who got infected after vaccination exhibited mild symptoms while 18.60% were asymptomatic. However, 22.60% of respondents reported severe symptoms in the infected individuals (Figure 8B). The majority of participants (63.90%) didn't know about any individual, who died after getting fully vaccinated, 11.70% people were not sure of it and 24.50% of participants reported that they have heard about the individuals who expired post-vaccination (Figure 8C).

A. Do you know any person who got infected with COVID-19 after getting vaccination?

8.90%
10.10%
31.80%
32.80%
16.30%

■ Yes; after first dose   ■ Yes; after both the doses
■ No   ■ Can't say
■ Yes; more than one

B. If your answer to the previous question is yes, then what kind of symptoms did they exhibit?

18.60%
22.60%
58.80%

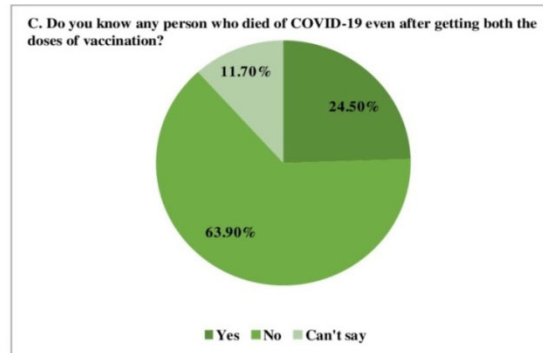■ Asymptomatic   ■ Mild symptoms   ■ Severe symptoms
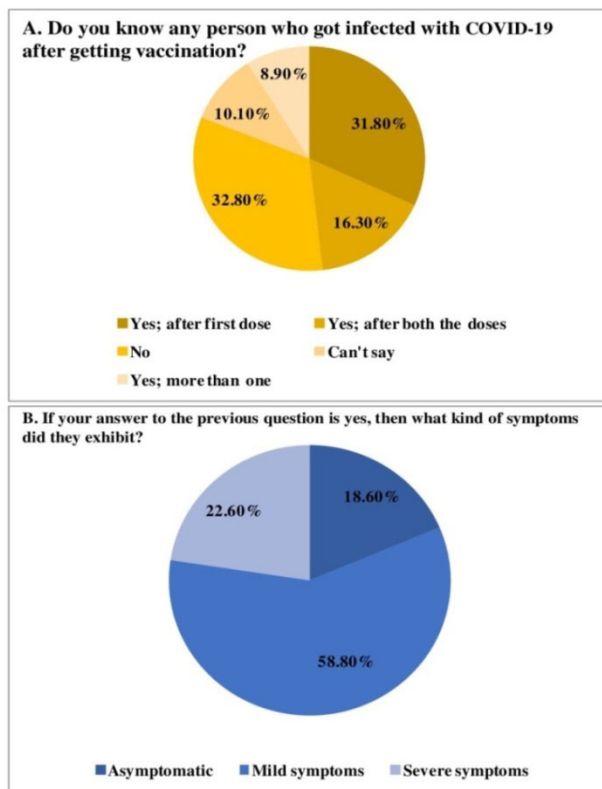
Figure 8. Post-vaccination infection and symptoms

Opinions of individuals regarding COVID-19 vaccination

Lastly, we thought it worthwhile to know individual opinions of the general public concerning COVID-19 vaccination. Thus, individuals were asked to share their opinions regarding the same so as to obtain a general idea about its availability, accessibility and effectiveness. In the present survey, 19.61% of individuals are of the opinion that people should get vaccinated and 22.91% consider it to be a necessary measure. Eighty-seven people (16.89%) considered vaccines to be good and 11.84% considered vaccination safe. Many people also shared their concerns about the availability and affordability of the vaccines with few (1.74%) urging that they should be made freely
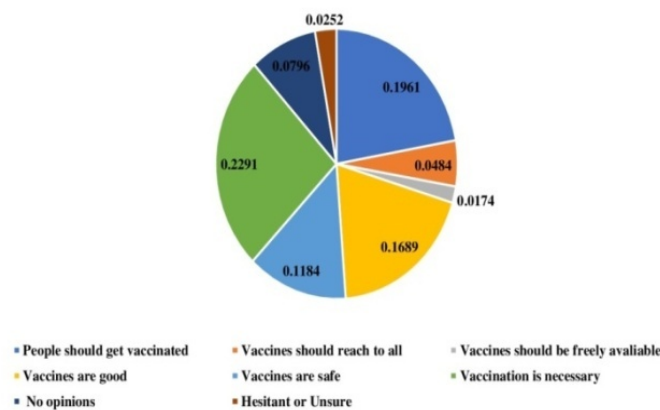

Figure 9. Opinions of individuals regarding COVID-19 vaccination

available and others (4.84%) suggesting that they should be made accessible to all. A minor percentage of people (2.52%) were still hesitant to get vaccinated, while 7.96% were unsure enough to provide an opinion on the subject (Figure 9).

Discussion

The coronavirus is an extremely dreadful virus that has claimed many lives till date, as evidenced by the number of persons afflicted with it and who died due to COVID-19 (Verity *et al.*, 2020). So, to safeguard people, GOI has taken a great initiative to get entire population vaccinated. The pace of COVID-19 vaccination has increased several folds over a few months as is evident from the substantial rise in the production rate of vaccines. People now seem to be more aware about the significance of vaccination (Jaber *et al.*, 2020). However, some of them still have reservations about immunisation and doubt its efficacy.

There is a lack of awareness, particularly among the remote and less educated population where misconceptions tend to outweigh the reality (https://aif.org/covid-19-vaccine-related-misconceptions- and-other-barriers/). Being a country with the largest proportion of young people, it cannot be ignored that juveniles (persons below the age of 18) are yet outside the sphere of vaccination in India thus constituting a vulnerable mass of the population. Viewing the current situation, India has boosted the production of vaccines. As of now, more than millions of people are getting vaccinated on a daily basis. Despite the on going rumours and misconceptions about vaccines, people believe that vaccination will help in preventing the spread of the virus and will consequently facilitate controlling the disease and risks associated with it (Islam *et al.*, 2021a).

With these considerations in mind, we designed a questionnaire to examine people's views about vaccination, its effects and its significance. People across the country responded to it (the majority of the people belonged to the 18-44 years age group) and we found that a huge percentage of people 90.10% and 96.50% respectively felt that vaccination is vital for the protection and considered it safe. 66.40% of the respondents felt safe in getting their child vaccinated and 29.70% were still unsure thus suggesting the need to spread awareness about the

significance of vaccination. Moreover, more than half of those polled i.e., 57.10% preferred the Covishield vaccine, probably because of its better availability, efficacy and lesser price per dose. According to studies, Covishield is more efficient as antibodies triggered by it are more in comparison to Covaxin. Covishield and Covaxin both were developed in India but Covishield got recognised by World Health Organization (WHO) much earlier while Covaxin still hasn't. People travelling to other countries need to get vaccinated with vaccines which are recommended by the WHO.

The time gap between dose 1 and dose 2 provided by the GOI was another concern for many people but the majority of our respondents (57.30%) gave a positive response and stated that the time gap is sufficient. However, there were still some respondents (about 35.10%) who think that the time gap should be decreased. The majority of our respondents i.e. 59.60% were partially vaccinated and about 18.40% were fully vaccinated which states that the GOI has been successful in running the drive among people. Both government and private health care facilities have been given the task of vaccinating the people of the country. In government hospitals or centres established by them, vaccines are freely available but private hospitals or facilities charge beneficiaries as per the rates fixed by the GOI. In our study, 11.80% of respondents reported having been charged for the vaccines. This may be because they got their vaccination at some of the private health care services.

Out of the total respondents who reported having had a medical history, 5.60% experienced post-vaccination symptoms. Pain at the site of injection was observed to be the most common symptom as reported by 58.10%, succeeded by fever and body ache. The symptoms lasted for nearly two days in a greater part of the participants. These post-vaccinations symptoms corroborate with the symptoms reported by the ministry of health and family affairs that after getting vaccination like swelling or pain at the site of injection, mild fever, mild headaches, irritability, etc. (https://www.mohfw.gov.in/covid_vaccination/vaccination/common-side-effects-aefi.html).

As per reports, like other vaccines, COVID-19 vaccine is also not 100% effective, however, immunisation is considered the

best way to slow down the spread of the virus and prevent the risk of infection (Liu *et al*., 2021; Xing *et al*., 2021). Moreover, there are chances of people getting infected even after vaccination especially if they are residing in areas with a high infection rate. In India and other countries like the USA, there were few cases of COVID-19 infections and deaths of people despite being vaccinated. As per the reports by CDC (Centers for Disease Control and Prevention), in the USA, around 750 people died from COVID-19 even after being fully vaccinated.

However, it was later reported that out of these, 142 cases were asymptomatic or were not related to COVID-19. Hence, further evaluation was done by detecting whether respondents knew anyone in their vicinity or had any knowledge of any case where people got infected or died even after getting vaccinated. In this regard, surprisingly, 32.80% of the respondents replied pessimistically and 24.50% of individuals said they do not know any person who died of COVID-19 infection post-vaccination. Further, when it came to the post-vaccination ferocity of COVID-19 contamination, 18.60% of individuals were asymptomatic, 58.80% had mild symptoms, and 22.60% had severe symptoms. Our survey suggests that post-SARS-CoV-2 infection, symptoms were found to be less severe in the vaccinated population. These findings were in sync with those of previous research on the same topic; however, the vaccinations used in those trials were different (Menni *et al.,* 2021).

In the present study, less number of respondents i.e. about 21.90% were not vaccinated yet due to several reasons stated by the respondents. The most common reasons were the unavailability of vaccines, people being infected with COVID-19 and difficulty in booking the vaccination slots. Moreover, during the second wave of COVID-19 in India, a huge number of people got infected and the production of vaccines declined. This in turn affected the availability of vaccines and led to a shortage at vaccination centres. This was also a reason for partially vaccinated people and those waiting for second dose. Some of them were waiting for the Sputnik V vaccine which was still in process of preparation. Another reason was that this survey was conducted when some people like lactating mothers were not eligible for vaccines though vaccines

have now been proven to be acceptable for pregnant and breastfeeding mothers (https://www.cdc.gov/coronavirus/2019-ncov/vaccines/recommendations/pregnancy.html).

There could be other reasons behind the respondents not getting vaccinated including any autoimmune disorder, allergy to the vaccine or similar medical conditions. In contrast to other studies where younger age groups were found to be more willing toward vaccination, our results suggested that respondents within the age group 18-44 were the least interested (Bhargava *et al*., 2021; El-Elimat *et al*., 2021). This could be due to anxiety after seeing people developing serious symptoms post vaccination, self-assurance as the body immunity is higher at this age compared to that in the 45+ age group, accessibility to social media spreading misinformation regarding vaccines along with the factual information on COVID-19 infection. As observed by our study people of 45+ age have experienced comparatively less severity of symptoms than people ranging from 18-44 age which could be one of the reasons for the prevailing hesitancy in people.

The opinions of 28.73% of individuals were based on the certainty that vaccination is safe and sufficient, 42.52% believed that vaccination is necessary as per the current situation and that everyone should get vaccinated to safeguard themselves from the deadly COVID-19 virus, 2.25% of people were still unassertive regarding getting vaccinated and 7.96% were doubtful to provide an opinion on the vaccination. The majority of our respondents (95.30%) believed that sole vaccination is not enough as they are not fully efficient and since there are cases of infections post-vaccination, there is also a need to adhere to the necessary precautionary protocols like wearing mask, maintaining social distance, avoiding crowded and less ventilated places even after getting fully vaccinated.

Conclusions

In a country with the world's second-largest population, it needed a lot of effort to launch such a large vaccination campaign. The initiative was taken by the government by spreading awareness about the vaccines, urging people to get vaccinated and adhering to the guidelines and protocols issued by the government to

prevent the deadly virus from spreading. They had to overcome numerous obstacles while establishing this campaign, but it is currently performing admirably. It can be seen that post-vaccination infection of COVID-19 didn't cause seriousness, rather the individuals developed mild symptoms of infection. Most of the respondents were vaccinated, either partially or fully, and the majority of them hold a positive attitude towards the overall process of vaccination. They discern that vaccination is imperative and everyone should get vaccinated. Though vaccines are quite efficacious, their effects differ in people with their differing immunities. Also, it has to be ensured that vaccination and obedience to the necessary guidelines go hand in hand. Thus, the above studies altogether clearly indicate that vaccination helps in slowing down the transmission of the virus, consequently, the spread and severity of disease, need for hospitalisation and mortality rate. Also, enhancing public awareness as well as vaccination drives and immunisation of people can significantly reduce infection and death rates.

Acknowledgement

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