

POST VACCINATION SURVEY FOR MONITORING THE BENEFITS AND SIDE EFFECTS ASSOCIATED WITH COVID-19

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ABSTRACT

The current COVID-19 pandemic has urged the scientific community internationally to find answers in terms of therapeutics and vaccines to control SARS-CoV-2. Real-world effectiveness studies are important for monitoring the performance of COVID-19 vaccination programs and informing COVID-19 prevention and control policies. Vaccines are effective interventions that can reduce the high burden of diseases globally. Covid-19 vaccines have been tested by multiple drug administration authorities in the world. They are proven to be effective in reducing your probability of contracting COVID-19. Once you are vaccinated, your body is much better prepared to shield off more viruses by making your immune system stronger. Vaccination is the most important thing we can do to protect ourselves and our children against ill health. They prevent up to 3 million deaths worldwide every year. Vaccines teach your immune system how to create antibodies that protect you from diseases. It's much safer for your immune system to learn this through vaccination than by catching the diseases and treating them. However, public vaccine hesitancy is a pressing problem for public health authorities. With the availability of COVID-19 vaccines, little information is available on the public acceptability and attitudes towards the vaccines in India. This study aimed to investigate the post-vaccination status of COVID-19 vaccines and their predictors and the attitudes towards these vaccines among the public. An online, cross-sectional questionnaire was instrumentalized to survey participants in the acceptability of vaccines. The survey form was sent to all age groups people out of which 525 responses were received. This survey worked as an effective tool to analyse and draw out conclusions from the experiences, thoughts, and knowledge of people about vaccination.

Keywords – Covid -19, Vaccination, Pandemic, India, SARS-CoV-2.

1. INTRODUCTION

The fatal COVID-19 was first found in Wuhan China in December 2019[1]. Coronavirus disease 2019 (COVID-19) is an emerging respiratory infection caused by a novel coronavirus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)[2]. This highly contagious zoonotic coronavirus (SARS-CoV-2) spread to most parts of the world (200 countries) and created a public health emergency [3]. It has crown-like spikes on the outer surface which explains why it is named coronavirus. Coronaviruses are minute in size (65–125 nm in diameter) and contain a single-stranded RNA as a nucleic material, size ranging from 26 to 32kbs in length. The subgroups of the coronaviruses family are alpha (α), beta (β), gamma (γ), and delta (δ) coronavirus [4]. Coronavirus

was declared as a variant of interest (VOI) by WHO it was therefore declared a pandemic on 30 Jan 2020 by WHO due to its rapid spread. Efficient and effective viral detection methodologies are a critical piece in the global response to COVID-19, with PCR-based nasopharyngeal and oropharyngeal swab testing serving as the current gold standard [5]. India faced the first wave in Jan 2020. The second wave which was more severe due to the delta variant was faced by India in March 2021. India faced the third wave in November 2021 due to the omicron variant [6]. This led to an urgent need for the development of vaccines for protection purposes. So, it was analyzed that covid 19 vaccination is a reliable way to build protection and decrease the risk of contracting the virus. India began its vaccination program on 16 Jan 2021 operating about 73600 centers to date [7].

Two vaccines were authorized by the Indian drug regulator for emergency use, namely Covishield and Covaxin[8].COVAX is a global effort committed to the development, production, and equitable distribution of vaccines around the world. There are 190 countries and territories engaged in the covax facility.

Through the clinical trials conducted it was concluded to provide Covaxin for the vaccination of children. Covaxin by Bharat Biotech is developed in collaboration with the Indian Council of Medical Research (ICMR) - National Institute of Virology (NIV). Both Covishield and AstraZeneca are Manufactured by Serum Institute of India Pvt Ltd [9]. Covaxin, Covishield, and AstraZeneca all are mRNA Vaccines. India's drug regulator has approved the world's first DNA vaccine against Covid-19 for emergency use [10]. The three-dose ZyCoV-D vaccine prevented symptomatic disease in 66% of those vaccinated, according to an interim study quoted by the vaccine maker Cadila Healthcare [11].

Vaccine hesitancy was defined by the WHO Strategic Advisory Group of Experts (SAGE) as “delay in acceptance or refusal of vaccination despite the availability of vaccination services”. Vaccine acceptability is determined by three factors: confidence, convenience, and complacency [12]. The majority of participants agreed that side effects, doubts regarding the protective effect of the vaccine, high cost, and shortage of the vaccine are potential barriers for COVID-19 vaccination [13]. Vaccination provided at the government center was free of cost on the other hand vaccination through private hospitals was charged. Sputnik cost 1145 Rupees, Covaxin cost 1400 rupees and Covishield cost the least as compared to the other 2 i.e 780 rupees [11]. The vaccination program for essential service providers started on 16 Jan 2021. For people above 60 years and 45 years with comorbidities on 1st March 2021. For people above 45 years, it started on 1st April 2020. For people between the age group 18-44 years, it started on 1st May 2021. For children between 15-18, it started on 3rd Jan 2022(only Covaxin is approved for children)2 doses of each vaccine are required to be taken to get completely vaccinated. The difference between the 2 doses for Sputnik-V is 21 days, for Covaxin is 28 days while for Covishield is 84 days [11]. The booster dose, or 'precautionary' dose, is allowed from January 10 for essential service providers and for people who are 60 and above with comorbidities. Boosters should be taken nine months after the second dose [14]. BBV152 is a covaxin booster dose. BBV152 has led to tolerable safety outcomes and enhanced immune responses [15]. Clear and consistent communication by government officials is crucial to building public confidence in vaccine programs. Effective campaigns should also aim to carefully explain a vaccine's level of effectiveness, the time needed for protection (with multiple doses, if required), and the importance of population-wide coverage to achieve community immunity [16]. Major milestones were achieved under the guidance of our honorable Prime minister Narendra Modi with the major contribution of front-line workers. Eg Over 2.5 crore doses of the COVID vaccine have been administered by midnight on September 17, 2021, making this the highest single-day vaccination. Also, surveillance for adverse events post-vaccination was done by the Adverse Event Following Immunisation (AEFI) surveillance system. It enhanced monitoring of early COVID-19 vaccine

recipients and passive surveillance, standardized reporting and pharmacovigilance mechanisms, platforms in hospitals to evaluate the vaccine-specific antibody correlates, and cross-reactivity to other strains. [17].

2. METHODOLOGY

The cross-sectional survey was decided to assess the post-vaccination status on individual health of people. We collected data using an online survey platform to avoid face-to-face interaction or physical interaction. we received 525 responses. There was a total of 15 questions with multiple-choice questions, through this we got the information about the type of vaccine taken, side effects observed, medication taken to relieve them, and trust of people in the type of vaccine taken. All the individuals who responded to the survey were informed about the confidentiality of their responses and the purpose of the survey. Each individual of India who is eligible to take the vaccine was included in this survey. The evaluation of this survey was done electronically using the interface provided by common survey software conducting site available on the internet. Covid protocols were completely followed while conducting this survey. For this, we circulated Google forms to people through online platforms. So face to face interactions was completely avoided.

Table 1: Post Vaccination Survey Questionnaire

Sr no.	Questions	Option
1.	Name	
2.	Gender	a. Male b. Female c. Prefers not to say
3.	Which age group do you fall in?	a. 15 to 18 yrs b. 18 to 30 yrs c. 30 to 60 yrs d. Above 60

<p>4.</p>	<p>Have you received the COVID-19 Vaccine?</p>	<p>a. Yes, first dose (partially vaccinated)</p> <p>b. Yes, second dose (completely vaccinated)</p> <p>c. Yes, fully vaccinated and Booster dose</p>
<p>5.</p>	<p>Which COVID-19 vaccine have you received?</p>	<p>a. Covishield</p> <p>b. Covaxin</p> <p>c. SputnikV</p> <p>d. Other</p>
<p>6.</p>	<p>Why did you decide to take the vaccine of the above-mentioned company?</p>	<p>a. Found it safer</p> <p>b. Accepted worldwide</p> <p>c. Read from sources</p> <p>d. Recommended by someone</p>
<p>7.</p>	<p>Have you experienced any side effects after your 1st dose?</p>	<p>a. Yes</p> <p>b. No</p>

	if yes, then which side effects	<p>a. Difficulty breathing</p> <p>b. Swelling of your arm, joints pain</p> <p>c. Nausea/Vomiting</p> <p>d. Dizziness</p> <p>e. Fever</p> <p>f. Headache</p> <p>g. Other</p>
8.	Did you take 2 nd dose in a proper span of time as required	<p>a. Yes</p> <p>b. No</p>
9.	How did you act to relieve the side effects that appeared after vaccination?	<p>a. I took a rest at home</p> <p>b. I took painkillers while staying rested at home (Crocin/Paracetamol, Dolo 650, Multivitamin tablets, etc.)</p> <p>c. I went to a doctor's clinic, but there was no need for hospitalization</p> <p>d. I have been admitted to a hospital, and I received the required healthcare service.</p>
10.	How long did the side effects last?	<p>a. Less than 1 day</p> <p>b. 1 to 3 days</p> <p>c. 4 to 7 days</p> <p>d. More than 7 days</p>

<p>11.</p>	<p>Do you have any of the following diseases/disorders?</p>	<p>a. Diabetes</p> <p>b. Hypertension</p> <p>c. Skin disease</p> <p>d. Alzheimer</p> <p>e. Other</p>
<p>12.</p>	<p>Do you take any kind of medicine on daily basis for the above-mentioned disease?</p>	<p>a. Yes</p> <p>b. No</p>
<p>13.</p>	<p>Have you experienced any beneficial effect on your body post-vaccination, if yes what was it?</p>	<p>a. Feeling energetic</p> <p>b. Joint pain reduces</p> <p>c. Other</p>
<p>14.</p>	<p>After getting the vaccine are you following norms of social distancing, wearing masks etc?</p>	<p>a. Yes</p> <p>b. No</p> <p>c. Sometimes</p>
<p>15.</p>	<p>Have you been infected with COVID-19 after vaccination?</p>	<p>a. Yes</p> <p>b. No</p>
<p>16.</p>	<p>Taking a COVID-19 vaccination is,</p>	<p>a. Really important</p> <p>b. Neither important nor unimportant</p> <p>c. Don't know</p>

17.	How safe do you think the covid 19 vaccine was for you?	a. Not safe b. Moderately safe c. Very safe
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3. RESULT

The survey generated 525 responses and showed that around 60.8% of females and 38.7% of males participated in the survey (figure 1). It observed that around 77.9% population is in between 19-30 years whereas 11.6% falls between 31-60 years category, around 9.9% under 18 years and 0.6 % of the population is above 60 years category (figure 2).

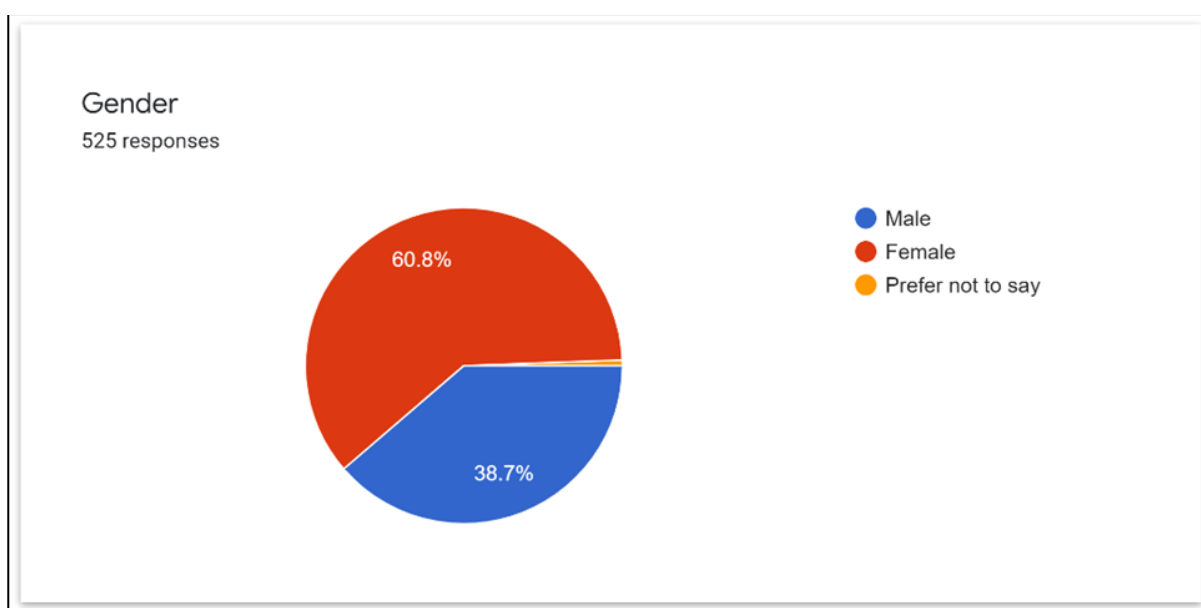


Figure 1: Gender

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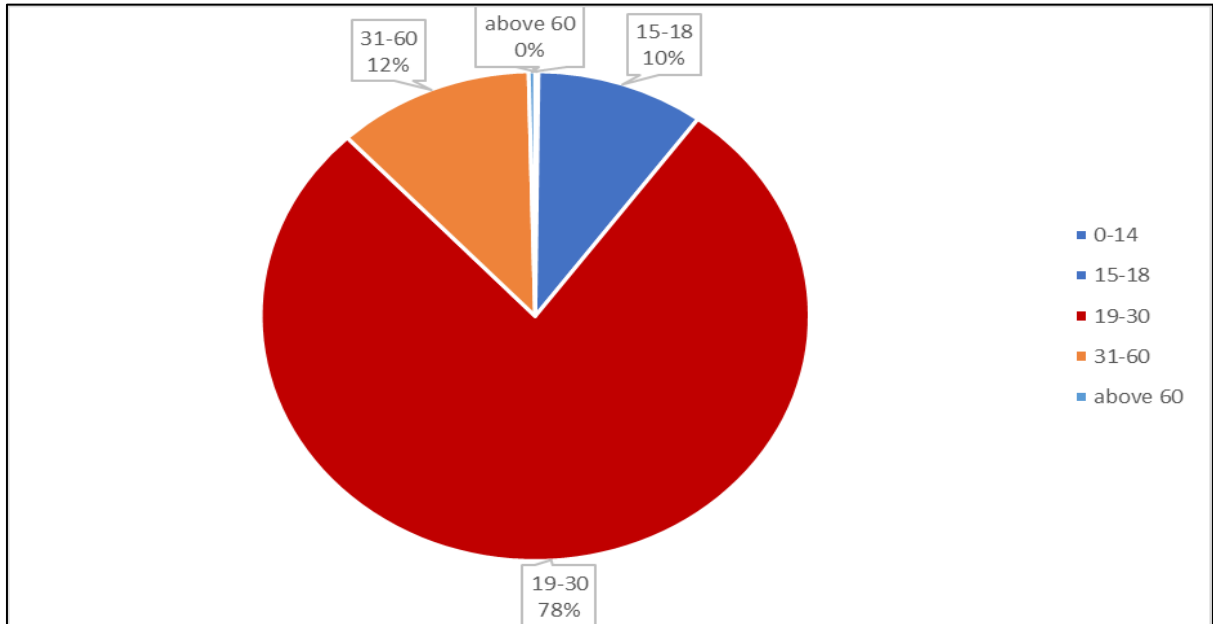


Figure 2: Age

1st dose is taken by 8.4% of respondents; 2nd dose is taken by 85.9% of respondents while around 5.7% are the ones who have taken even the booster dose (figure 3)

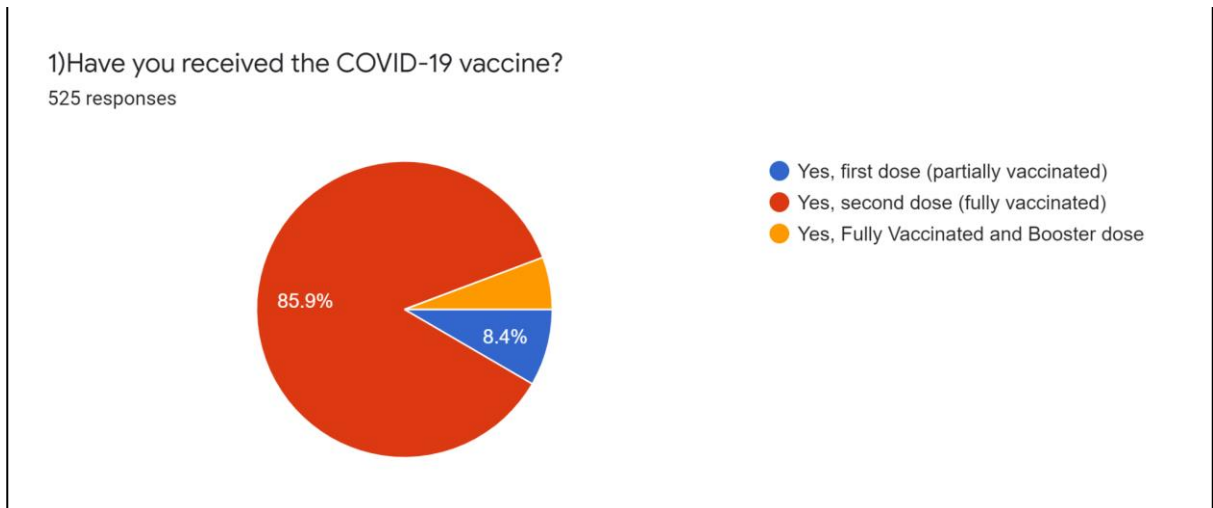


Figure 3: Vaccination Data

Around 85.9% have taken the Covishield vaccine while 13.1% have taken Covaxin, a small percent of 0.6% Haven taken Sputnik-V and 0.4% have taken other vaccine types i.e. Pfizer and AstraZeneca(figure 4).

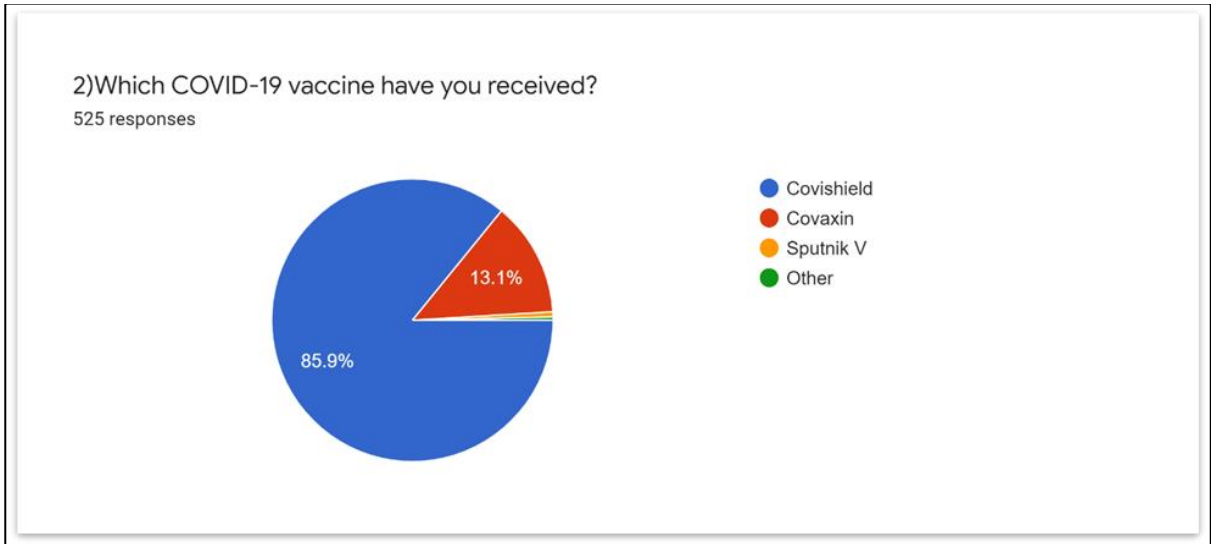


Figure 4: Name of vaccine

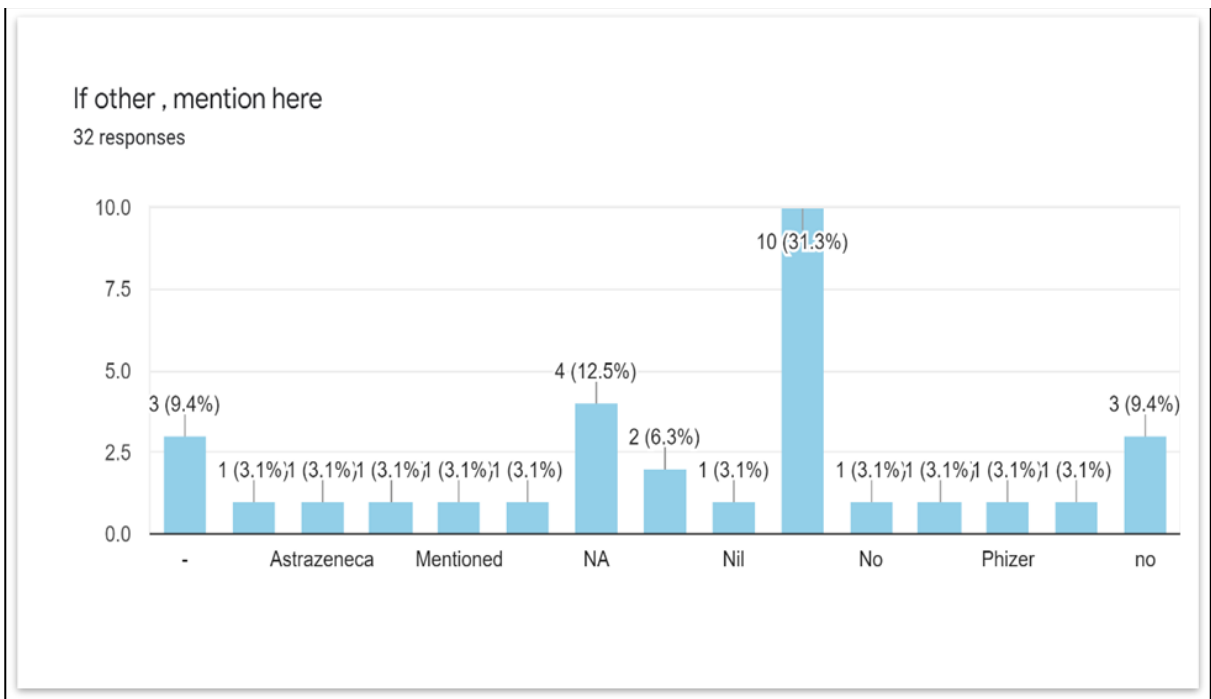


Figure 4A: Other vaccines received

On asking about their reasons for taking the above specific vaccine we came to know that about 60.8% feel that vaccine taken by them is safer, 62.5% thought that it is accepted worldwide, 74.6% read from the sources, 15.4% were recommended by someone while about 10.5% feel it is cost-effective (figure 5).

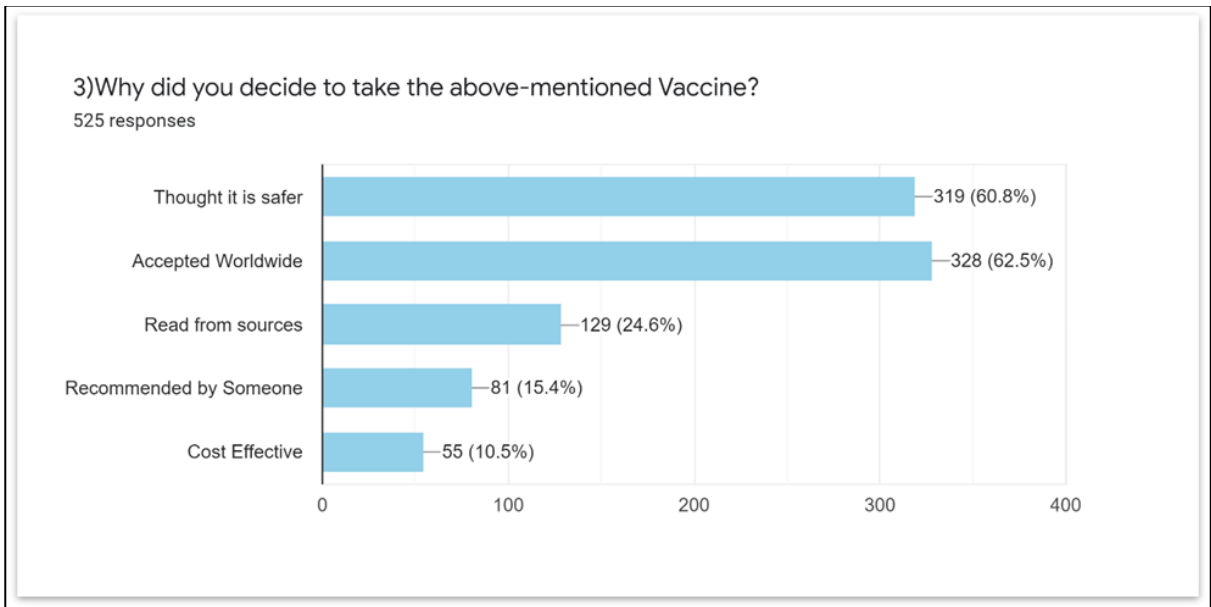


Figure 5: The reason for taking the vaccine

Concerning side effects, about 65.9% experienced side effects while 34.1% of respondents didn't experience any after taking 1st dose (figure 6).

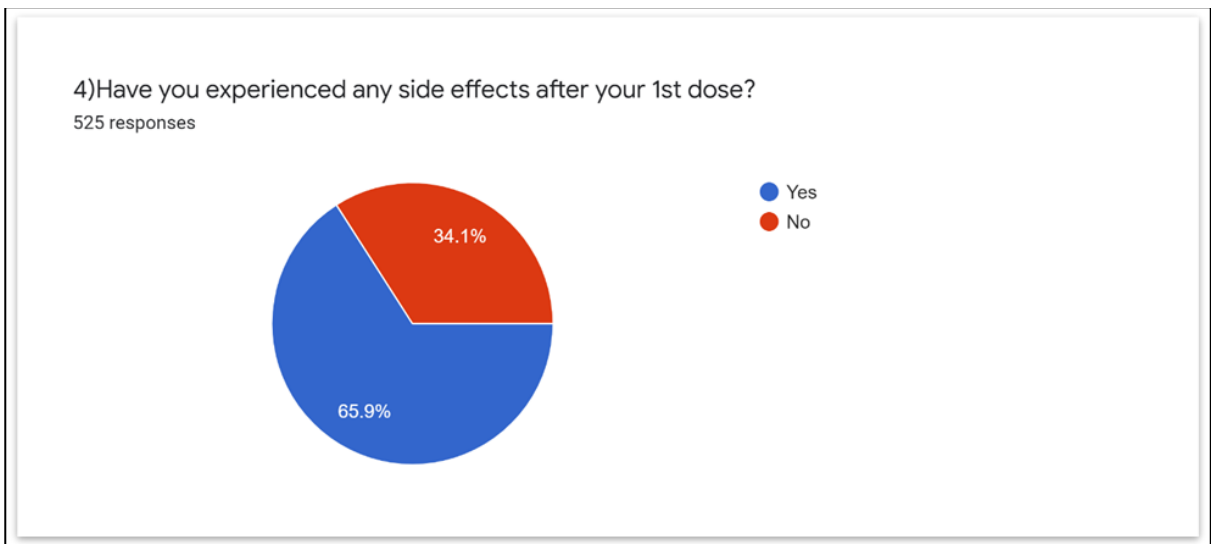


Figure 6: Side effects after 1st dose

The most common side effect observed after taking 1st dose was fever which is seen in 82.6% of people. other side effects like headache (50%), swelling in the arm and joint pain (40.9%) were also observed (figure 6A).

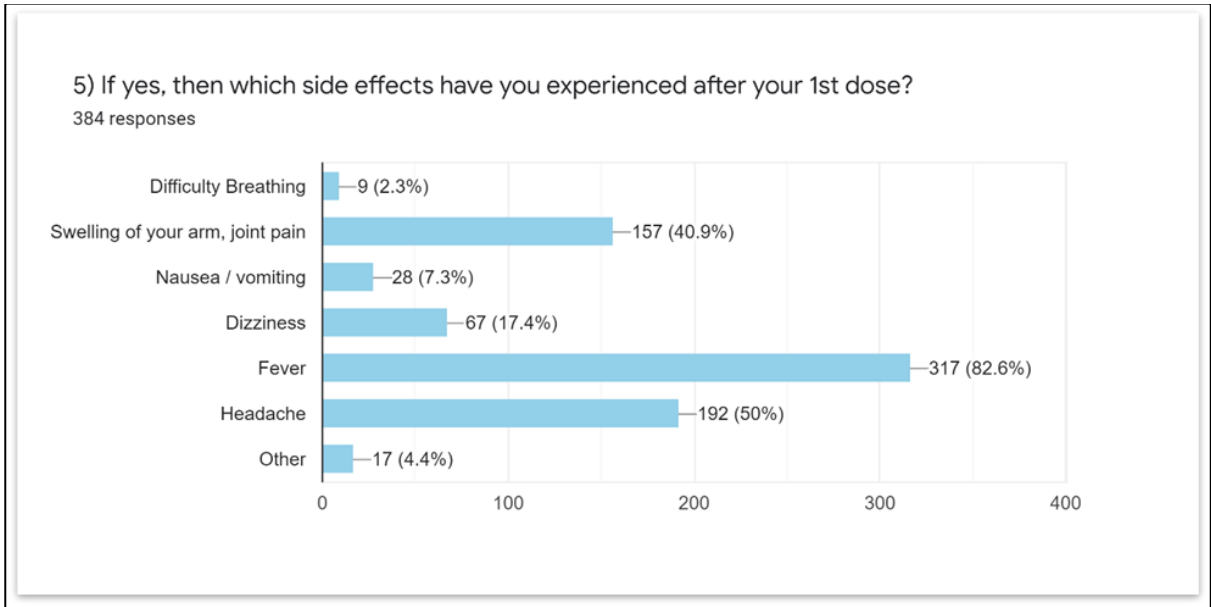


Figure 6A : Various side effects

The case reversed after the second dose, maximum number of respondents i.e. 81.3% didn't experience any side effects while 15.4 % did experience certain side effects (figure 7).

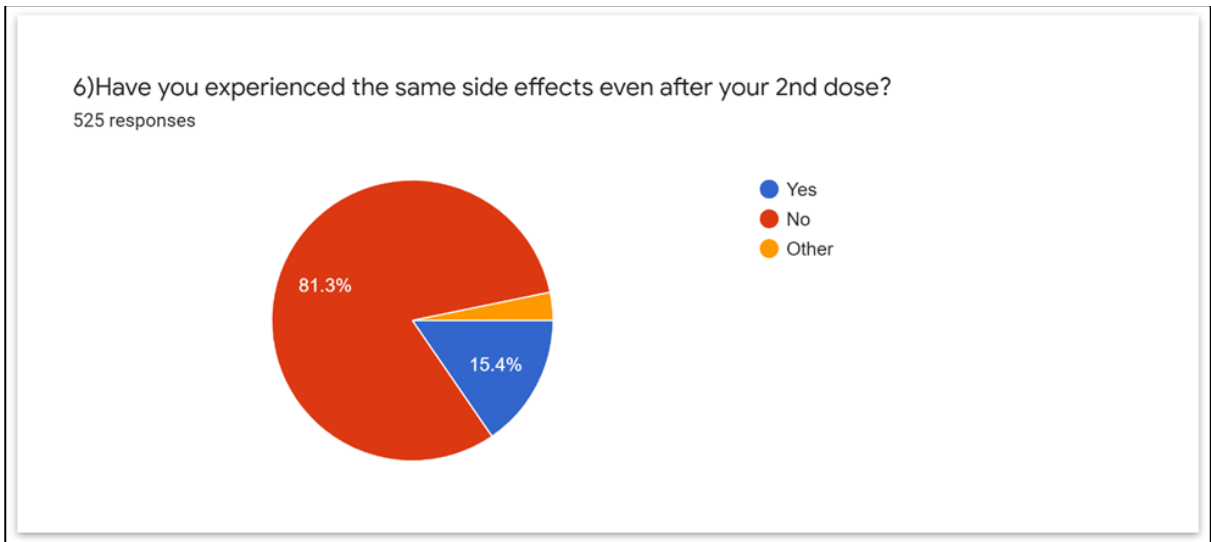


Figure 7: Side effects after 2nd dose

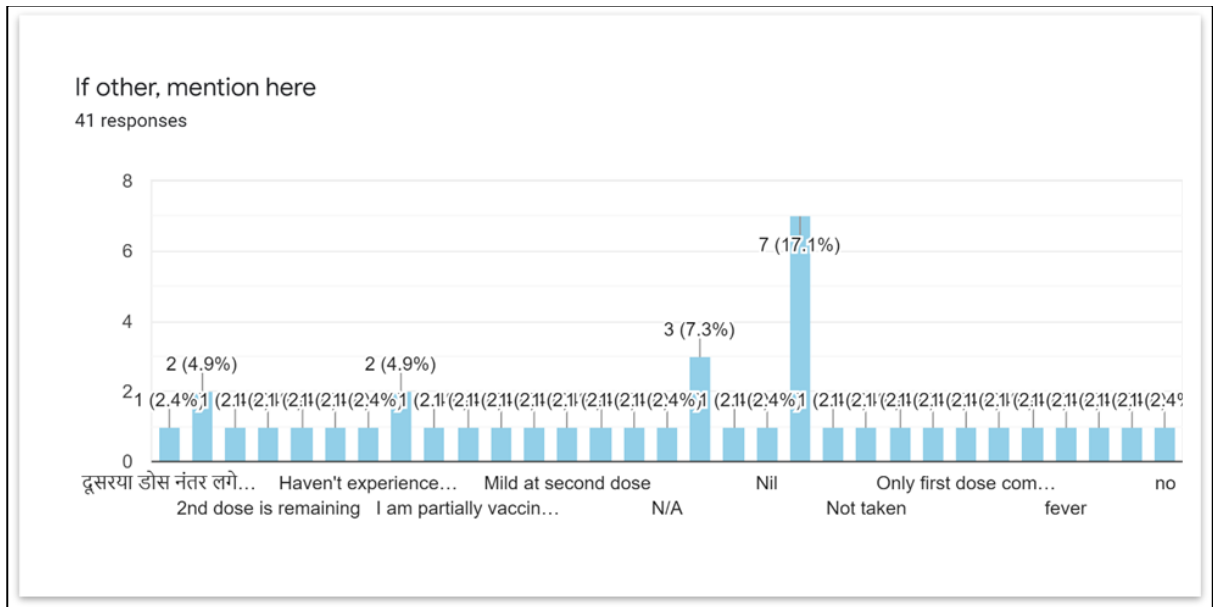


Figure 7A: Various side effects

For relieving the side effects 67.2% of people preferred taking a rest at home,60.2% by taking painkillers like Crocin/Paracetamol/dolo650/multivitamin tablets,1% consulted Doctor, and 1.5% needed hospitalization. While 7 % opted for other treatments (figure 8)

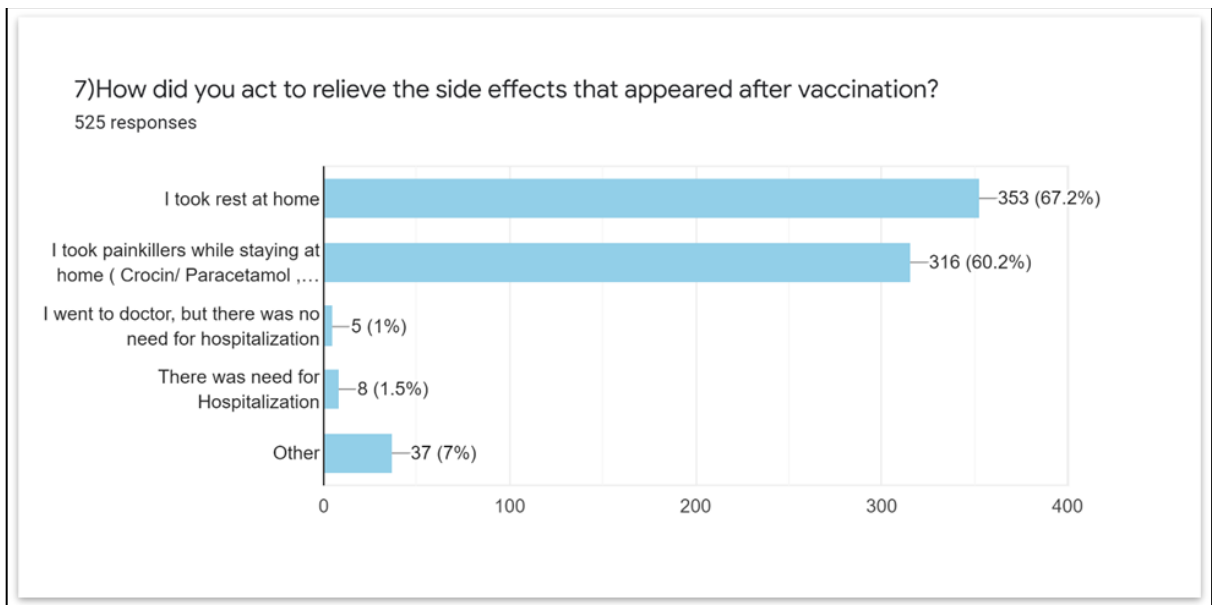


Figure 8 : Ways to relieve side effects

While focusing on the duration for which they experienced side effects we came to know that in 45.2% of people it lasted for less than 1 day, 1-3 days for 48.7% people, 4-7 days for 5.1% while more than 7 days for a small percent of 1.1% (figure 9).

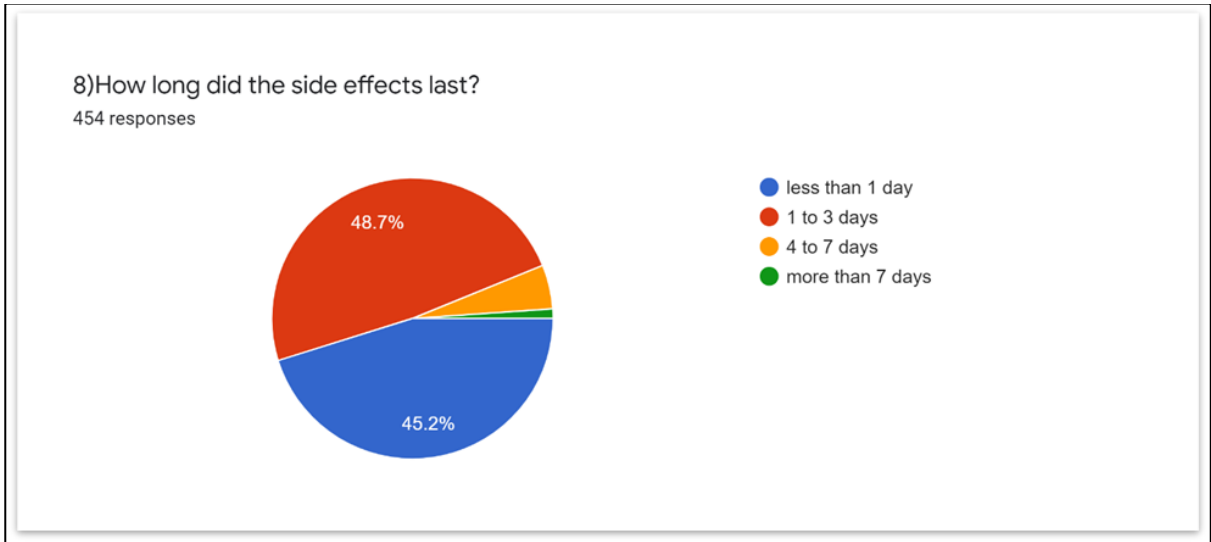


Figure 9 : Duration of side effects

On asking if the respondents have any disorder we got to know that 2.1% of them have diabetes,1.5% have hypertension,1.3% have skin disorders,0.2% Alzheimers,3.2% had disorders other than those mentioned here,92.6% don't have any. Among them, 6.6% take medicine to treat the disorders (figure 10 & 11).

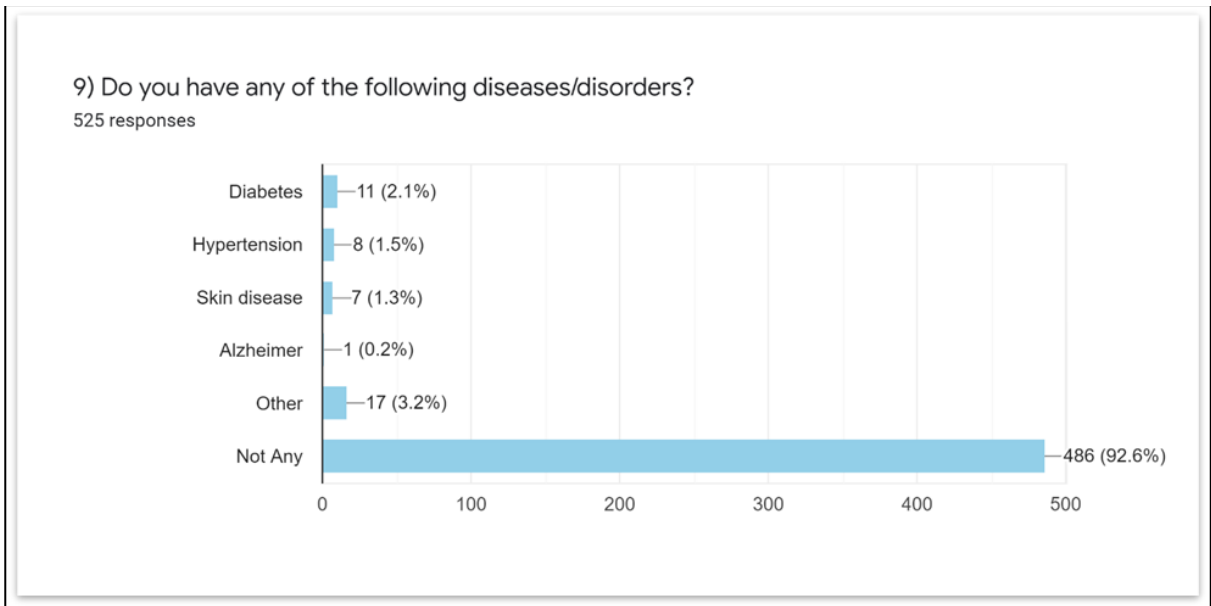


Figure 10: People suffering from any disease/disorders

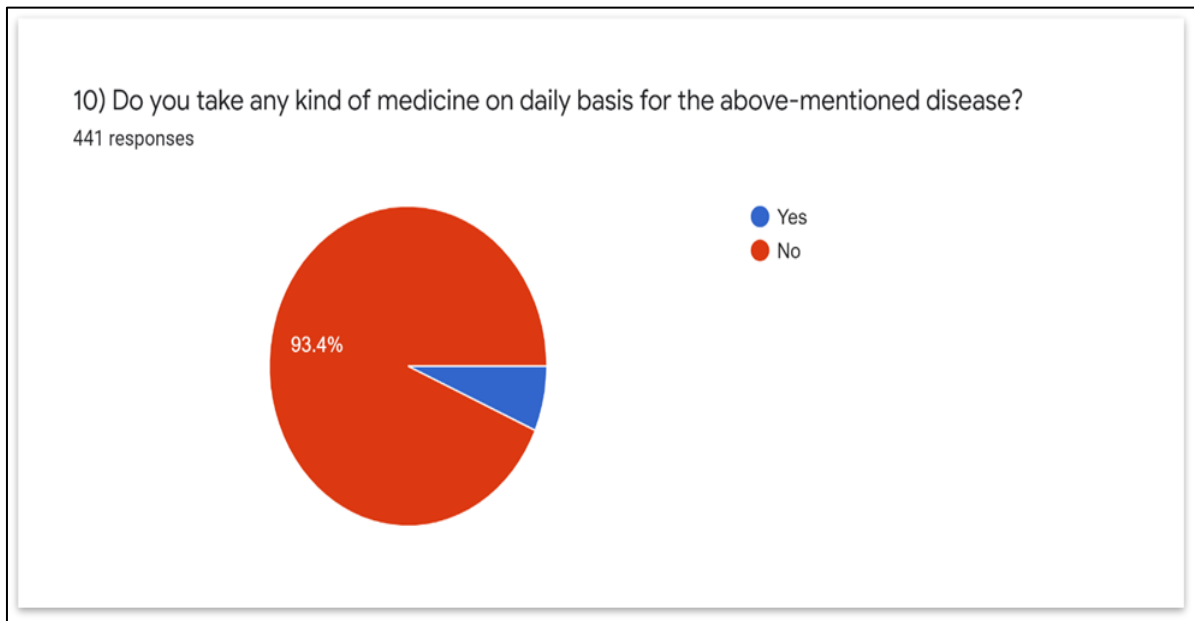


Figure 11: People taking medicine

When asked about they experience of any beneficial effect on the body post-vaccination 88.8% of people didn't experience any, while 4.4% felt energetic,0.4% felt reduced joint pain.,6.9% felt reduced cold and cough,1.9% experienced other beneficial effects (figure 12).

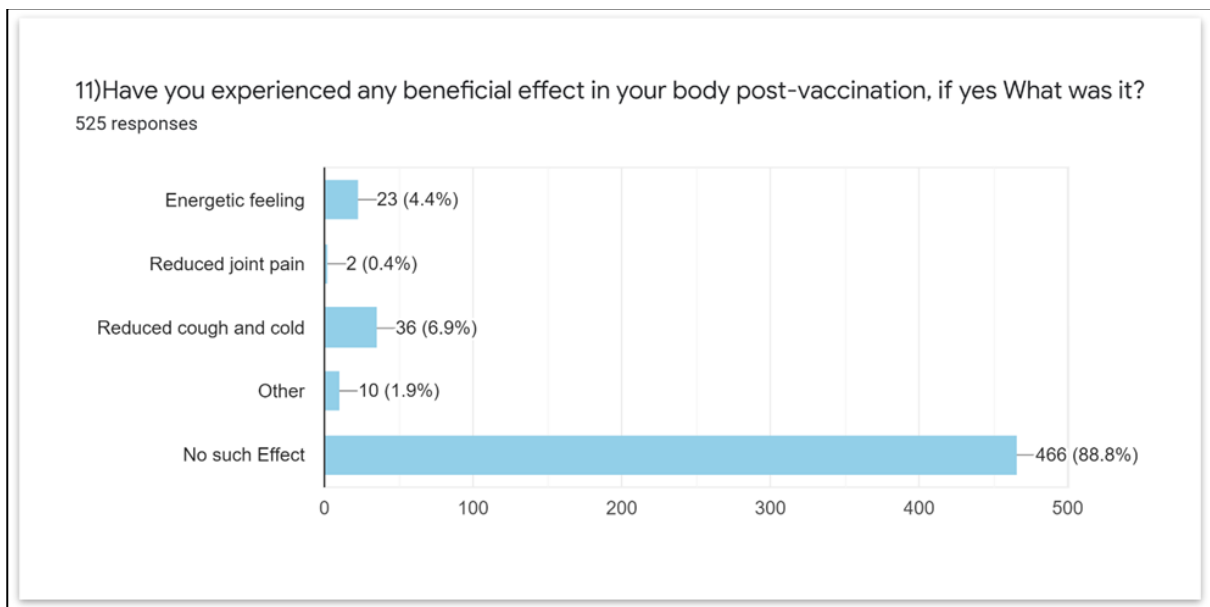


Figure 12: Experience any beneficial effect

While asking whether they follow Covid-19 protocols (Sanitization, Social Distancing, Wearing masks, etc) 89.7% said that they follow, while 2.5% don't follow and 7.8% follow sometimes (figure 13).

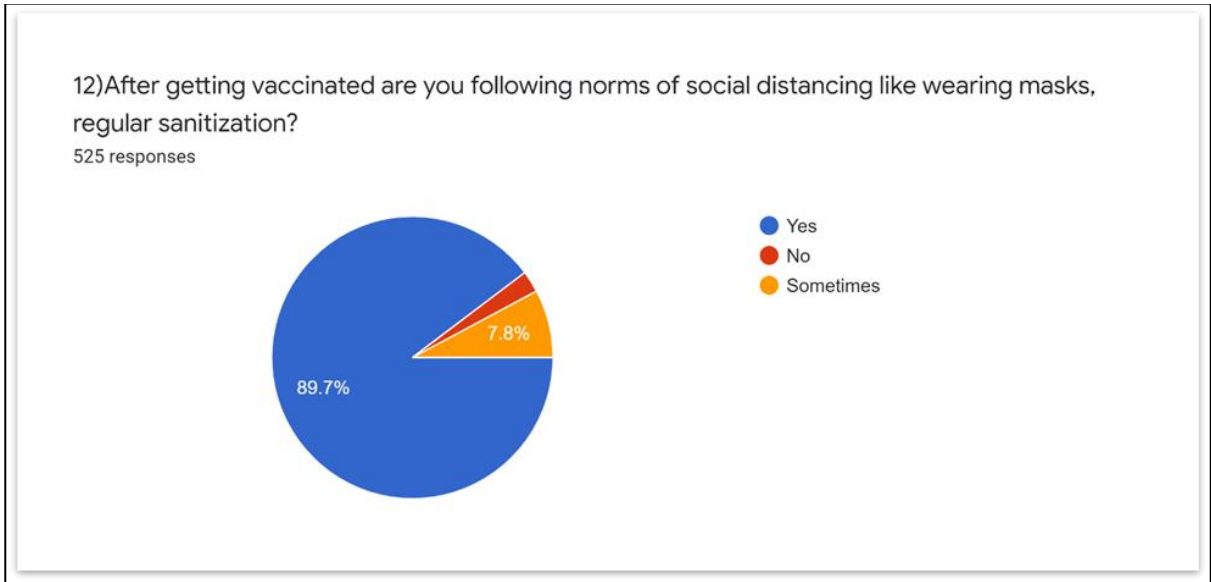


Figure 13: People following norms

While asking about infected with Covid Post-vaccination, 6.9% were infected with Covid post-vaccination, while 93.1% were safe (figure 14).

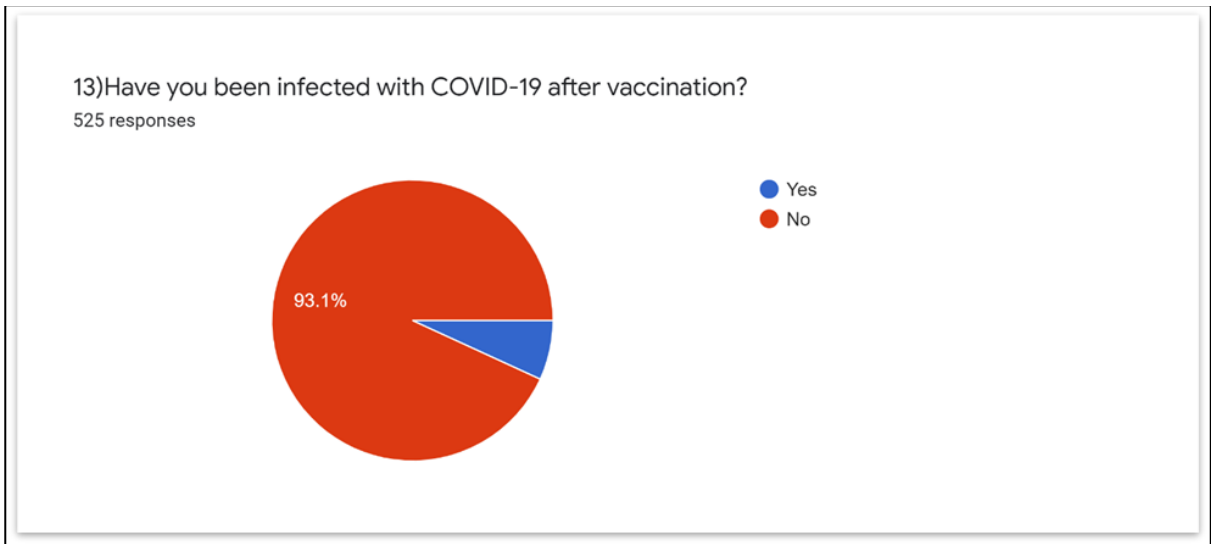


Figure 14: Infection after vaccination

While asking about their views about safety of Vaccine they took , 43.4% of respondents felt that the vaccine they took was very safe, 54.5% thought it was moderately safe, and 2.1% thought it was not safe (figure 15).

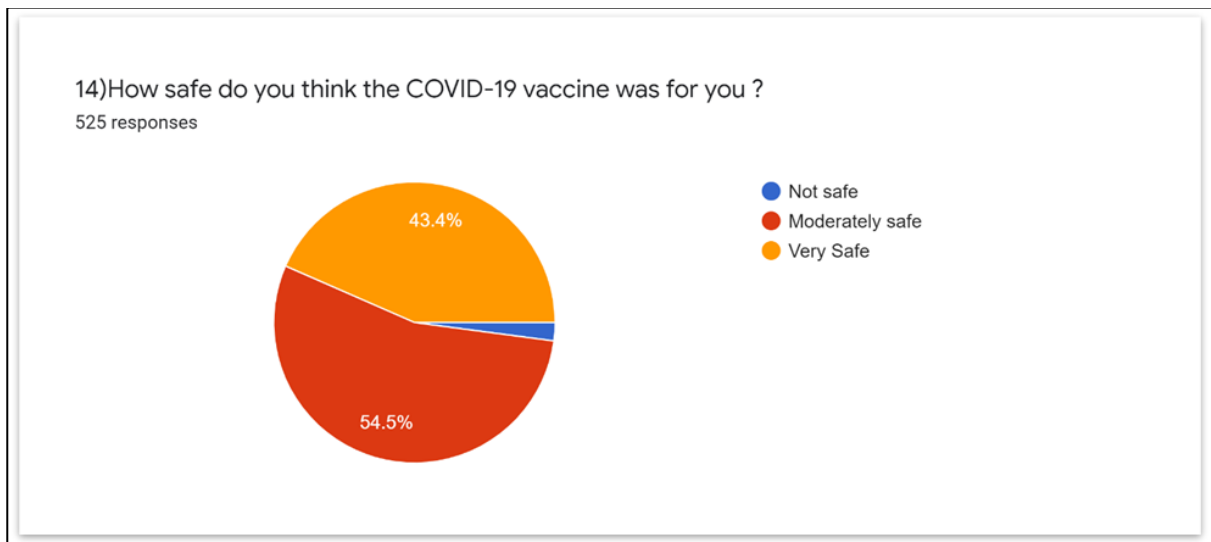


Figure 15: Safety of vaccination

4. DISCUSSION

This survey is regarding the benefits and side effects associated with COVID-19 as well as to monitor the vaccination status in India. The form was created in English and conducted by an online platform. Overall, 525 responses were received of which around 60.8% female and 38.7% male filled the form.

There is still a lot to learn about the impacts of vaccination and post COVID-19 condition. However, it is very clear that preventing SARS-CoV-2 infection is the best way to prevent the development of the post-COVID-19 condition or long COVID. The use of vaccines reduces hospitalization, reduces mortality. That's why vaccination is important for those who are eligible. Public health measures such as mask-wearing in the appropriate places, physical distancing, hand-washing, are also extremely important to prevent COVID-19 [18]. Most people who have COVID-19 do develop an immune response, but there is a subgroup of people, particularly those who have had a very mild infection, and sometimes they don't even know it, it's asymptomatic so in general, taking a vaccine regardless of the fact whether they have a previous infection or not is necessary.

It was found that around 85.9% of survey people were vaccinated with the second dose and 8.4% of people completed their first dose. Most of the people preferred the Covishield vaccine followed by covaxin, sputnikV. One of the things that people are concerned about is the side effects of vaccination. Around 65.9% of survey people experienced the side effects after 1st dose and this number reduced to 15.4% after taking 2nd dose. The current study investigating the data about the side effects, understanding why they're occurring, in whom they're occurring, and trying to identify whether there are specific groups of people who are more at risk, which it doesn't seem to be, and balancing that very rare and low risk against the benefit of protection against COVID disease [19]. The government of India has launched helpline numbers to provide guidance and counseling, in collaboration with different institutes of national importance. World Health Organisation has urged to take the necessary precautions to tackle the negative impact of the spread of coronavirus on physiological health and well-being. It is suggested that the waning vaccine effectiveness was greater among older adults and among adults in clinical risk groups [20].

In our survey, it was found that 67.2% of survey people took rest at home and took painkillers like paracetamol/crocin, dolo 650 for relieving the side effects. These side effects did last for 1 to 3 days in 48.7% survey population and less than 1 day in around

45.2% of people. Survey data showed that 93.1% of the survey population had not been infected with COVID-19 after taking the vaccine. Around 54.5% of people think that vaccine is moderately safe for them, 43.4% of people chose vaccine is very safe while 2.1% of people think it is not safe.

5. CONCLUSION

Vaccination is a safe and effective way to prevent this pandemic and save lives. Remember when we get vaccinated, we aren't just protecting ourselves, but also around us. As per our survey, most of the people took Covishield followed by Covaxin and then Sputnik-V, they found that Covishield is largely available and feel that it is safer than other vaccines. Almost every age group who is eligible to take a vaccine is fully vaccinated. It shows that peoples are aware of the benefits of vaccination. Most of the people experienced side effects after their first dose while very few of them experienced side effects after the second dose. For those people who have age-related disorders like diabetes, hypertension, Alzheimer's, and some skin disorders the vaccine is safe for them too as it does not have any synergistic or antagonistic effect with other drugs.

Some people also claim that they experienced beneficial effects post-vaccination such as energetic feeling, reduced joint pain, reduced cough, and cold. Very few survey people were infected with covid-19 post vaccination but it did not require hospitalization as it had lesser symptoms. Most people follow norms governed by the government even today.

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