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Research Article

Acceptance of COVID-19 Vaccination and its Related Determinants among Adult Population in India

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Abstract



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Background: SARS-Cov-2 (severe acute respiratory syndrome coronavirus 2) infection emerged as an epidemic and it was declared as a pandemic by the world health organization (WHO). Vaccines are developed to induce viral immunity, and vaccinating the entire population is urgent to limit the spread of the pandemic. Attaining herd immunity can be difficult with less vaccine acceptance.

Methodology: A cross-sectional study was conducted by using the snowball sampling technique. The survey was done between April 29, 2020 and May 19, 2020. The total number of responses obtained was 526. The questionnaire used in this study was based on previously conducted studies to estimate the rate of COVID-19 vaccine acceptance.

Result: 97.7% of the people that participated in the study were aware about the vaccine and said that they would be able to explain what a vaccine was. 82.9% of the respondents think that they are risking their own health and the health of their family by not getting vaccinated.

This study reports that the majority of population shows acceptance of the COVID-19, however it is evident from the other study results that this rate of acceptance is not sufficient. It is essential to identify the causes for hesitancy and ways to enhance the acceptance rates. By identification of these factors, healthcare professionals can develop techniques to work on areas that cause hesitancy among people and address their concerns. The demographical variations play a major role in determining the acceptance

Conclusion: In this COVID-19 pandemic, the most promising weapon for preventing the infection is the vaccine. More awareness and education about the need for vaccination and the hazards of avoiding the vaccine should be provided to people from authenticated sources.

Keywords: COVID-19, COVID-19 vaccine, cross-sectional study, vaccine acceptance, vaccine hesitancy.

1. INTRODUCTION

SARS-Cov-2 (severe acute respiratory syndrome coronavirus 2) infection emerged as an epidemic in late 2019 and it was declared as a pandemic by the world health organization (WHO) on 11 March 2020 due to its rapid spread around the globe. ¹ The deadly infection hit 161 million people and 3 million people lost their lives by 14 May 2020. ² The initial outbreak was reported in the Huanan seafood wholesale market, Wuhan, Hubei province, and was associated with a series of unknown pneumonia cases³. On 31 December 2019, China notified the WHO regarding the outbreak, and actions were taken by the Chinese government to control the epidemic and later carried out etiological research ³. On 7th January 2020, the etiological agent was confirmed as coronavirus with >70% similarity with the severe acute respiratory syndrome coronavirus (SARS-CoV).^{3,4} The WHO officially named this new virus as 2019 Novel Coronavirus (2019-nCoV) ⁵. The number of the case was hiking in China and as well started to disseminate to other places, this made countries including India to shift their citizens from China. On

January 30, 2020, the first COVID-19 case in India was confirmed in a student of Wuhan University, China hailing from the Thrissur district of Kerala.⁶

Since the first outbreak around 10 months, India reeled under the first wave and the cases surged in September and have reported 41% of positive cases and 34% of deaths.⁷ India's commitment to fight against the pandemic considering its vast and diverse population was significant. India took measures such as screening people and restricting entries at borders, tracing contacts, training healthcare workers, increasing testing capacities, enhancing health facilities, and addition of ventilators and medical supplies. The early nationwide lockdown helped authorities to bring down the rising cases. The first wave seemed to recede by October and nearly after six months, the cases started to rise from the first week of March 2021. The second wave of the pandemic started to spread rapidly in India affecting 24 million people and claiming the lives of 262 thousand people as of mid-May 2020.² The rationale behind the second wave is the double mutant corona virus and the spread of infection is more

intense than the first wave. It infects the younger population unlike the first outbreak, and most of the patients suffer from severe lung infections and hypoxia. Medical oxygen is the key treatment in fighting COVID-19 but the country is in oxygen shortage as a result of rising COVID-19 cases. To contain the virus and minimize the number of cases, several state governments have imposed curfews and lockdown on the movement. The containment efforts are effective as the overall positivity rate in India, which stood at 21.9%, later fallen to 19.8 % by mid-May 2021. Besides preventive and protective measures such as using a mask, social distancing, lockdown, etc., other short-term measures known as 'tactical treatments' like remdesivir, favipiravir, chloroquine, hydroxychloroquine, have been implemented. But these treatments cannot strengthen the immune system.⁸ Therefore, vaccines are developed to induce viral immunity, and vaccinating the entire population is urgent to limit the spread of the pandemic.

In pursuit of a safe and effective vaccine, researchers and scientists contributed to the discovery of the corona vaccine by acquiring knowledge from severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS) vaccine development strategies.⁹ and vaccines were made available by late 2020. The search for the vaccine was initiated immediately after finding out the infectious agent as SARS-CoV-2, and its genomic sequence. Researchers and pharmaceutical companies around the globe shared data and collaborated to win the race. As of May 2021, the vaccines under clinical trials are 90, and 27 are at the final stages of testing and 11 vaccines are approved for use.¹⁰ The main approaches of vaccine development include inactivated virus, Live-attenuated vaccine, viral vectors, nucleic acid vaccine, and sub-unit vaccines.¹¹ The first vaccine with the favourable result was a viral vector-based vaccine, the ChAdOx1 nCoV-19 (also known as AZD1222, AstraZeneca/University of Oxford) which is now manufactured by AstraZeneca-SKBio (Republic of Korea) and the Serum Institute of India (SII).¹²

India has emerged as the vaccine hub and attained the target to produce the cheapest vaccine against COVID-19. Out of 2 vaccines approved in India, Covaxin® ((BBV152 COVID-19 vaccine) is India's first home-grown vaccine produced by Bharath Biotech in collaboration with the Indian Council of Medical Research (ICMR) and Covishield® is a version of Oxford University-Astrazeneca.¹³ By April 2020, SII announced its partnership with the Oxford University, and 1ml vials with all the cellular material for the vaccine arrived at SII from Oxford in May 2020. While Phase III trials (CTRI/2020/08/027170) of Covishield® began in India on August 2020, severe adverse reactions were observed with the vaccine, which paused trials in other countries.¹⁴ Since no such effects were observed in India the trial continued and by November Astrazeneca observed their vaccine to be 70% efficient based on data from trial results. The company applied for the emergency use license and the Drug Controller General of India (DCGI) approved it in January 2021.¹³

Covaxin® gained approval for human trials from DCGI by the end of June 2020 and by late July 2020 Phase 1 clinical trials have begun.¹³ The vaccine entered Phase 3 trial by November 2020 and received restricted emergency approval from the Central Drugs Standard Control Organisation (CDSCO) on January 3 2021 before the completion of Phase 3 trial and without any data on how efficient it could be.¹⁵ The restricted emergency use of both Covaxin® and Covishield® proceeded to inoculate the hard-hit nation and the first vaccine drive began on 16 January 2021. A list of priority groups was prepared and those with a higher risk of exposure to the virus including healthcare providers and other front line workers were part of the initial group selected for vaccination.¹⁶ The

second phase of the inoculation drive started on March 1, 2021, and included senior citizens and those aged between 45-59 with co-morbidities. Moreover, India is also looking forward to begin the third drive of vaccination. India gifted around 55 lakh doses of vaccines to its neighbouring countries and its extended neighbourhood.

As per the recent reports, Russia's Sputnik V could soon be India's 3rd approved vaccine.

Vaccination is one of the major strategies to control the pandemic. WHO's Covax facility is functioning to ensure fair and equitable access to vaccines in every country to save their population, starting with the most vulnerable.¹⁷ Nevertheless, people still doubt the safety and efficacy of vaccines that are developed in a short time which normally would take years to develop. Public acceptance for a new vaccine is uncertain and vaccine hesitancy will remain an important challenge in immunization against COVID-19. WHO regards vaccine hesitancy as one of the major threats to global health.¹⁸ Moreover, attaining herd immunity can be difficult with less vaccine acceptance. Therefore, it is important to understand the concerns of the public regarding vaccine hesitancy to attain a decent vaccine coverage rate among the population.

2. METHODOLOGY:

2.1. Study design:

A cross-sectional study was conducted by using the snowball sampling technique. The survey was done between April 29, 2020 and May 19, 2020. Adults of 18 years or older and currently living in India were included in the study. The main inclusion criterion was the age (above 18 years). The survey composed of 36 questions on the Google form platform. Google form is a free online survey software included as part of the web-based Google Docs Editors suite offered by Google.

2.2. Sociodemographic characteristics:

The total number of responses obtained was 526. The demographic details collected for the survey are age, gender, the region where the respondent lives, marital status, education, occupation, and socioeconomic status. The respondents were also asked whether they belonged to the health care sector or not.

2.3. Instrument development:

The questionnaire used in this study was based on previously conducted studies to estimate the rate of COVID-19 vaccine acceptance.¹⁹ In this study, the questionnaire was piloted with 20 health care professionals and after reviewing and refining, the survey was shared. A link was generated from Google form and sent to Health Care professional students, government and private employees, self-employed, semi-governmental employees, and unemployed people. The questionnaire was developed in English and was circulated as Google form via e-mail, LinkedIn, Snapchat, WhatsApp, and Telegram.

The questions asked in the survey were divided into three sections:

In all the sections, a four-point scale (4= quite a bit, 3= moderate amount, 2= a little, and 1= not at all) with questions on concern and hesitation to get vaccinated were asked.

1. Attitudes and beliefs about COVID-19:

- COVID-19 pandemic:

This section was used to assess the insight of people on COVID-19 and the effect of the COVID-19 pandemic among the participants. There were five questions in this section. A yes or no question was asked to know whether the participants are aware of the prevalence of the COVID-19 pandemic.

- Effect of COVID-19 pandemic:

The participants were asked about the effect of COVID-19 on their social, personal, and work or professional life. They were also asked whether they believe that COVID-19 is now a serious threat to mankind. The respondents have to indicate their answers as “not at all, a little, moderate amount, and quite a bit”. This helps us to measure the concern people have towards the COVID-19 pandemic.

- Knowledge on vaccine:

Yes or no questions were asked in order to estimate the participants' exposure to vaccination for COVID-19. They were also asked whether the information provided by the health care system and the government satisfied their expectation or not. The sources of information were also estimated in the survey. The participants were also asked whether they are aware of the role of health care professionals in the battle against COVID-19 by risking their life. Their perspective on gender equality in vaccination was also recorded. The participants' beliefs on the effectiveness and safety of vaccines were also measured.

3. The role of vaccines in COVID-19:

In this section, respondents were asked whether there is an alternative for the COVID-19 vaccine to control the spread of this disease. The knowledge on the relation between the vaccine and the immune system was also tested in the survey. Their decisions to get vaccinated or not were also recorded. The impact of fear of initial side effects like fever, body ache were also measured which correlates to people avoiding vaccination. Respondents were asked whether they saw any bad reactions reported due to vaccination in their community. Their expectation of more advanced and effective vaccines to prevent COVID-19 was also estimated. Their satisfaction with the information and advice related to vaccination and immunization provided by the healthcare professional was

also recorded. The answers are recorded as “not at all, a little, moderate amount, and quite a bit”. The participants' concern about the COVID-19 vaccine and its impact on themselves and their families was also recorded.

2.4. Statistical analysis:

The total score obtained for each item was calculated and then converted to percentage in order to determine the rate of awareness, hesitation, knowledge on the COVID-19 vaccine and the COVID-19 pandemic. The data collected is presented as a table where N=526.

3. RESULTS:

3.1. Demographic Details:

The total number of participants involved in the study were 526. The participants were categorised into four groups, 18-25 years, 26-35 years, 36-45 years and above 45 years. Majority of the participants were females and they made up to 64.1% of the total population involved in the study. Females have acknowledged the concept of covid -19 vaccination better than men .124 (24.2%) respondents live in the city, 253(49.8%) of them reside in the village and 132 (26%) people live in the town. As of the marital status of the participants, 423(80.4%) of the participants were single. 173 (32.9%) of the participants were well educated with a post-graduation degree. 255 (48.55%) of them were graduates. 110 (21.7%) of the respondents were healthcare professionals and 196(38.6%) of them were healthcare professional students. Working class population has shown less compliance than students for the vaccine acceptance. The annual income of 236 (45.1%) participants was less than 1,00,000. 126(24%) earned between 1,00,000 and 2,00,000 per annum. 63 (13%) of the respondents have an annual income ranging between 2,00,000 and 3,00,000. 100 (19%) participants earn above 3,00,000 per annum. The demographic details of the respondents is given in table 1 and depicted in Fig 1.

Table 1: Social demographic details of the respondent

Category	Acceptance of covid 19 vaccine score			χ ² value	P Value
	Total Sample[n/N]	≤ Median (11)	>Median (11)		
Age Group (Yrs)					
18-26yrs	71.5	231	145	1.508	0.608
26-35yrs	16.2	58	27		
36-45yrs	5.5	19	10		
Above 45yrs	6.8	22	14		
Gender					
Male	35.9	134	55	8.406	0.004*
Female	64.1	196	141		
Region where they live					
City	24.2	87	38	4.498	0.106
Village	49.8	78	59		
Town	26	165	99		
Marital Status					
Single	80.4	264	159	0.137	0.987
Legally married	17.3	58	33		
Widow	1.1	4	2		

Divorced	1.1	4	2		
Education					
Postgraduate	32.9	104	13		
Graduate	48.55	160	5		
Diploma	4.6	19	95	5.536	0.237
High school	8.4	31	69		
Others	5.7	16	14		
Health Care					
Yes, health care professional	21.7	69	46		
Yes, health care professional student	38.6	124	79	1.477	0.478
No	39.8	137	71		
Occupation					
Government	4	17	4		
Private	20	56	49		
Self employed	4.8	17	8		
Not working	13.5	48	23	11.178	0.048*
Semi government	1.9	9	11		
Student	55.9	183	111		
Annual Family Income					
<1lakh	45.1	48	23	2.077	0.557
1lakh-2lakh	24	183	111		
2lakh-3lakh	12	17	4		
>3lakh	19	56	49		

*Significant

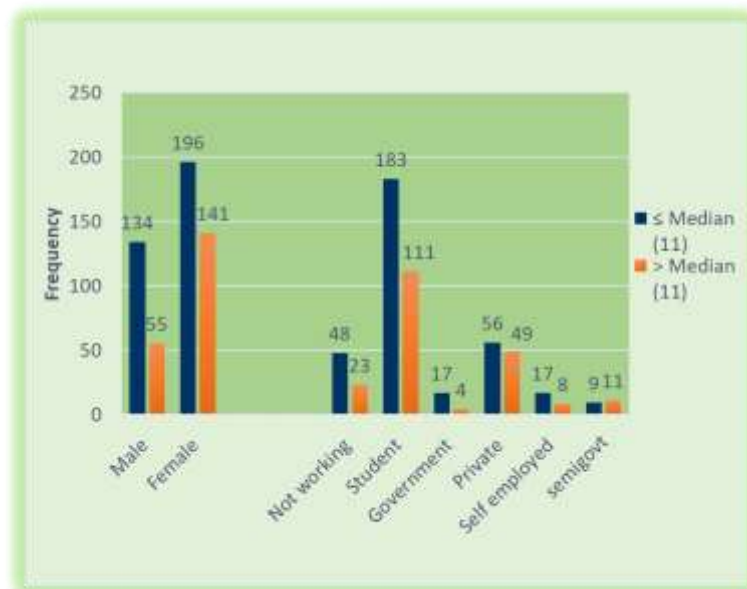


Figure 1: Acceptance of COVID -19 vaccines with respect to gender and occupation.

3.2. Attitudes and Beliefs about COVID-19:

522(99.2%) of the participants reported to have heard about the COVID-19 pandemic. 188(35.7%) of them see moderate effects on their work or professional life and 184(35%) of them agree that their work or professional life has been affected quite a bit due to the pandemic. 180 (34.2%) of them

seem to notice a moderate amount of change in their family lives as a result of the pandemic and 116 (22.1%) say that it has changed quite a bit. 7 (1.3%) think that COVID-19 is not serious at all, 37 (7%) believe it is little serious, 181 (34.4%) say that it is moderately serious and 301 (57.2%) say that it is quite serious. The attitudes and beliefs people tend to possess about the COVID-19 were collected and are depicted in fig2.

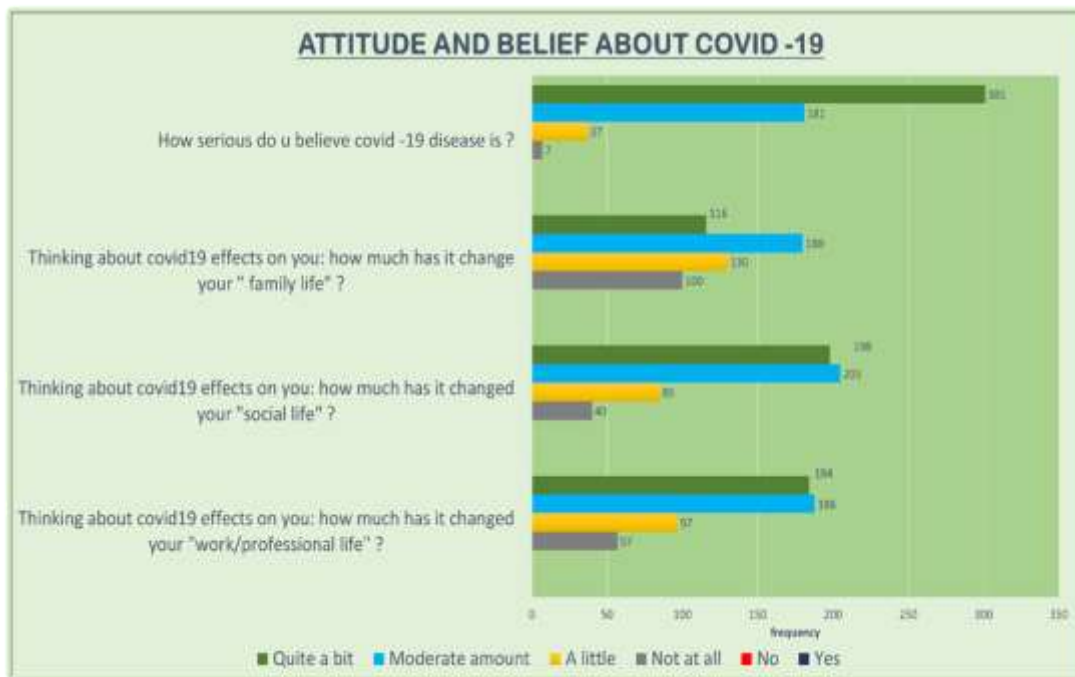


Figure 2: Attitude and belief about covid -19

3.3. Attitudes and Beliefs about a COVID-19 Vaccine:

We studied the attitudes and beliefs people tend to possess about the COVID-19 vaccine (fig 3). The participants seem to possess good knowledge about the pandemic. 522 (99.2%) of the participants were aware about the COVID-19 pandemic. 514(97.7%) of the people that participated in the study were aware about the vaccine and said that they would be able to

explain what a vaccine was [fig 4]. 436 (82.9%) of the respondents think that they are risking their own health and the health of their family by not getting vaccinated. 242 (46%) of the respondents say that they believe there are other better ways to prevent diseases which can currently be prevented by a vaccine and 284 (54%) of them do not agree with this fact.

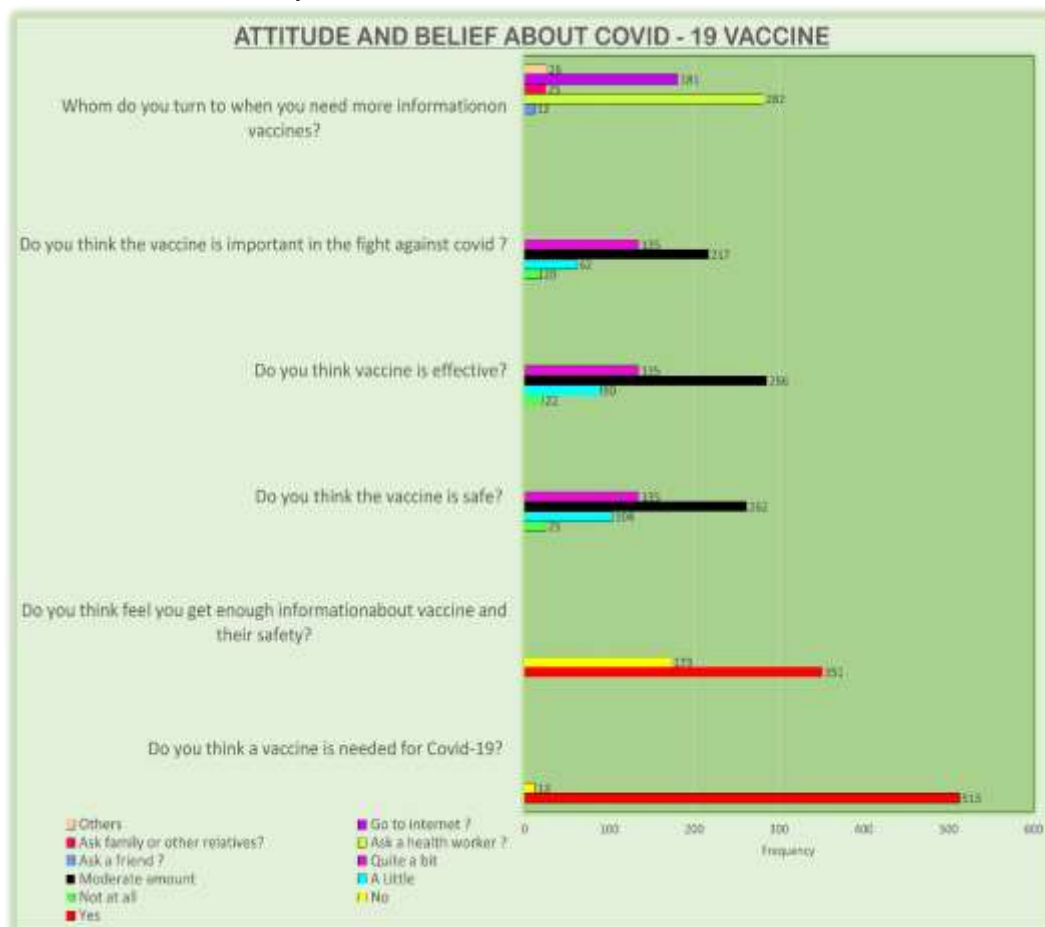


Figure 3: attitude and belief about covid -19 vaccine

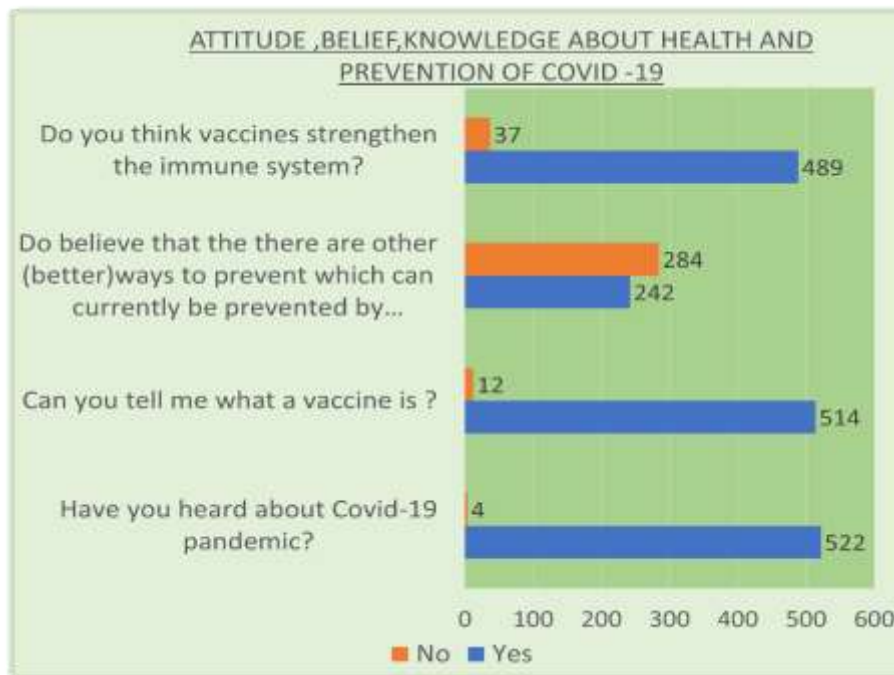


Figure 4: Attitude, belief, knowledge about health and prevention of covid -19

3.4. Experience with Vaccination and COVID-19:

489 (93%) of the participants think that a vaccine strengthens the immune system while 37 (7%) think it doesn't. The participants were questioned if they ever decided not to get

vaccinated themselves and 90 (17.1%) of them responded with a "yes" while 436 (82.9%) said "no". 266 (50.6%) of them reported to have known people who had bad reactions post-vaccination and 260 (49.4%) of them didn't. [fig 5]

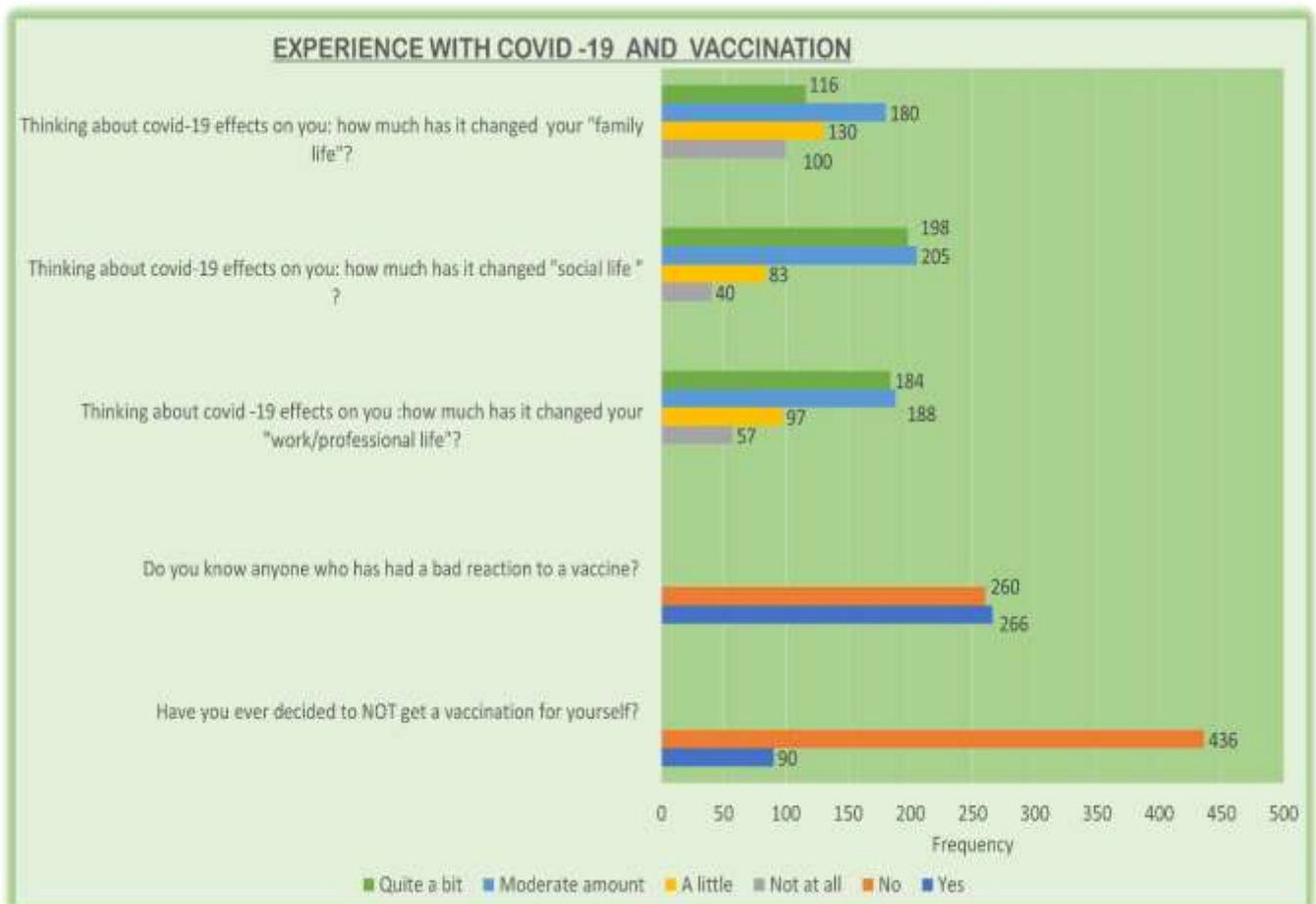


Figure 5: Experience with COVID -19 and vaccination.

3.5. Health System and Providers’ Trust and Personal Experience:

When asked the participants, how satisfied they were with their health professional’s/ health worker’s answers to the questions they had related to immunization, 261 (49.6%)

were moderately contented with the healthcare professionals’ answers and 107 (20.3%) were quite a bit satisfied. When we asked about how much they trusted the vaccine advice the health care provider gives them, 242 (46%) moderately trust the advice offered and 149 (28.3%) trusted the advice quite a bit. [fig 6]

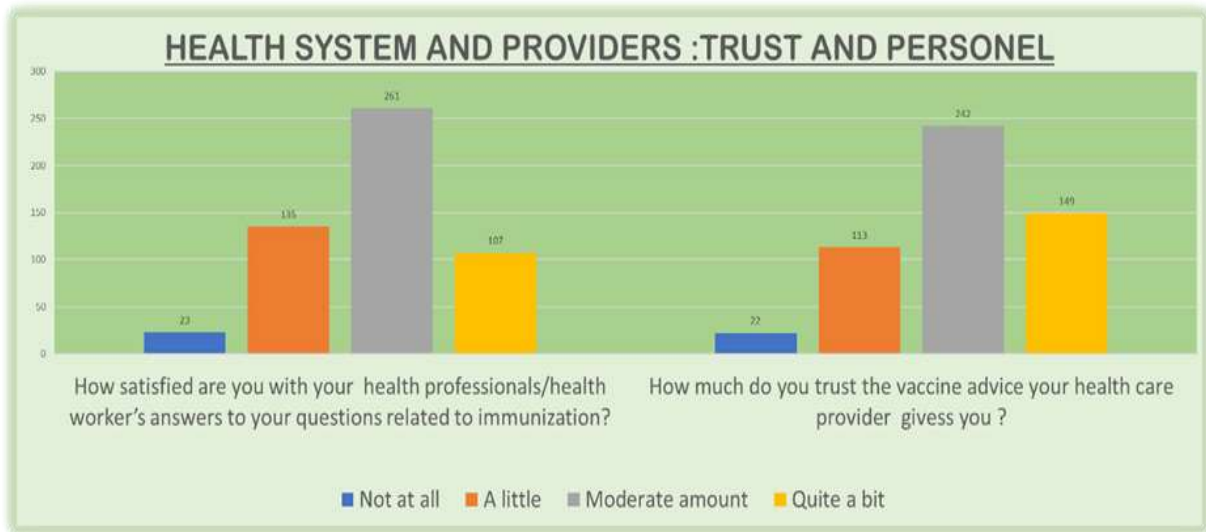


Figure 6: Health system and providers’ trust and personal experience.

3.6. Risk/Benefit (Perceived, Heuristic):

14 (2.7%) think that the COVID-19 vaccine is not at all important and 242 (46%) say that it is quite a bit important. When the participants were asked, how much concerned they

were about the COVID-19 vaccine, 203 (38.6%) of the respondents reported that they were quite a bit concerned. When questioned about the seriousness of the COVID-19 disease, 301 (57.2%) reported that they thought it was quite a bit serious. [fig 7]

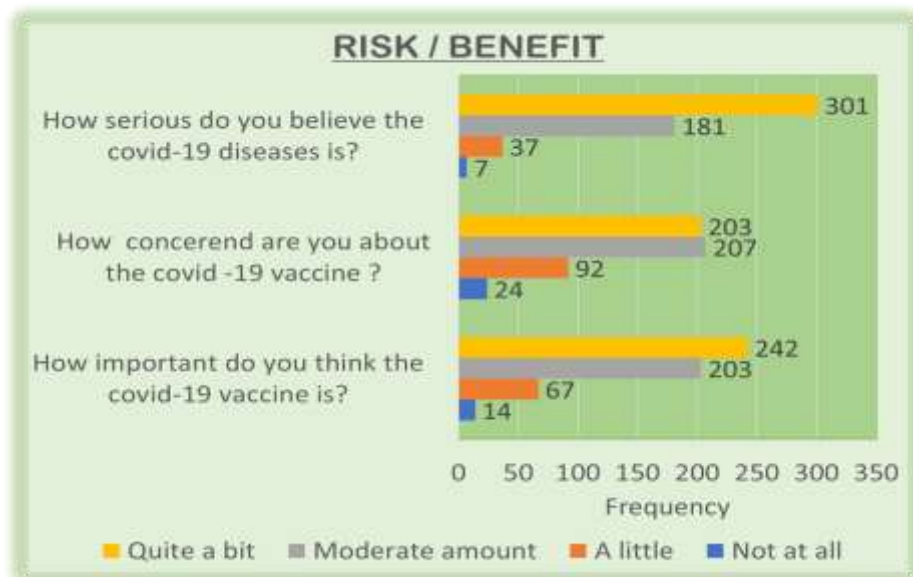


Figure 7: Risk / Benefit of vaccine

3.7. Religion/ Culture/ Gender/Socioeconomic Influences:

436 (82.9%) of the people in the study think that they are risking their health and the health of their families by not

taking the vaccine and 90 (17.1%) people do not feel this way. 100 (19%) of the participants think that it is more important for men to get vaccinated than women and 426 (81%) disagree to this fact. [fig 8].

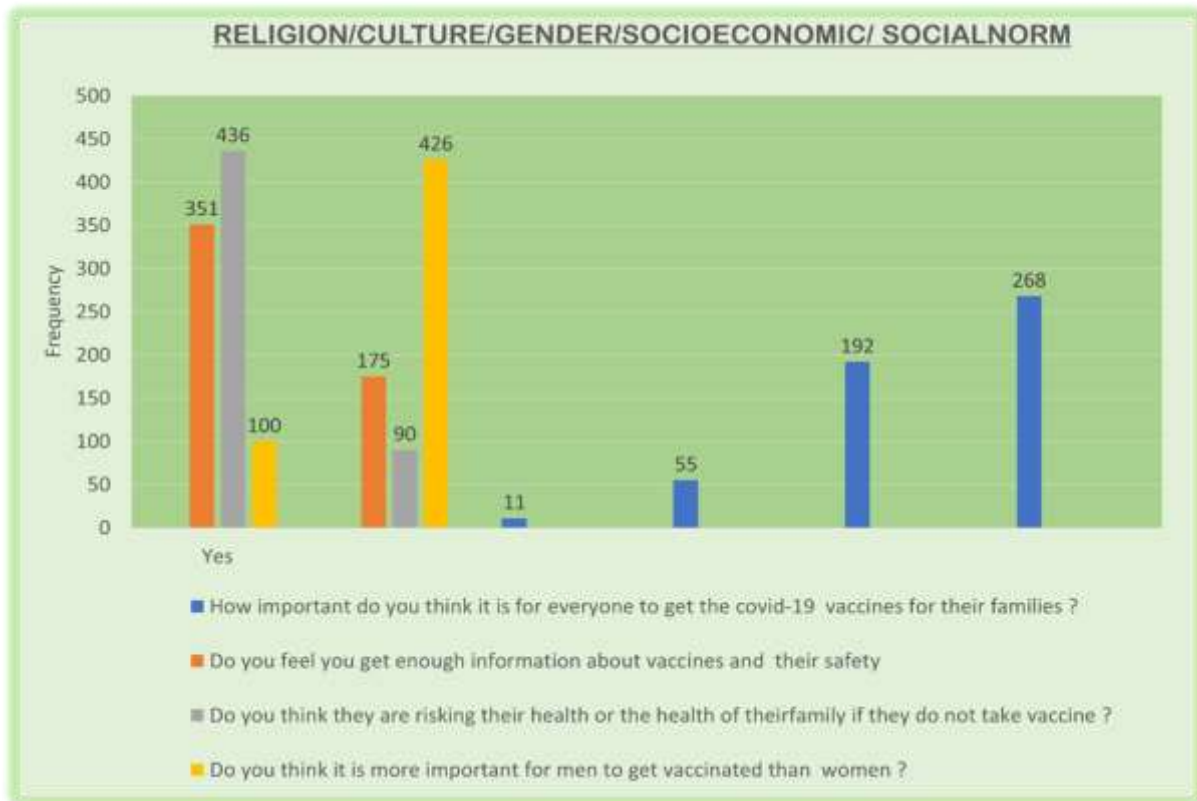


Fig 8: Religion/ culture/ gender/socioeconomic influences

3.8. Pharmaceutical Industry Influences:

369 (70.2%) of the respondents believe that the vaccine producers are really interested in the health of the public and

157 (29.8%) don't agree with this. 442 (84%) people trust the vaccine producers in providing safe and effective vaccination and 84 (16%) people don't. [fig 9].

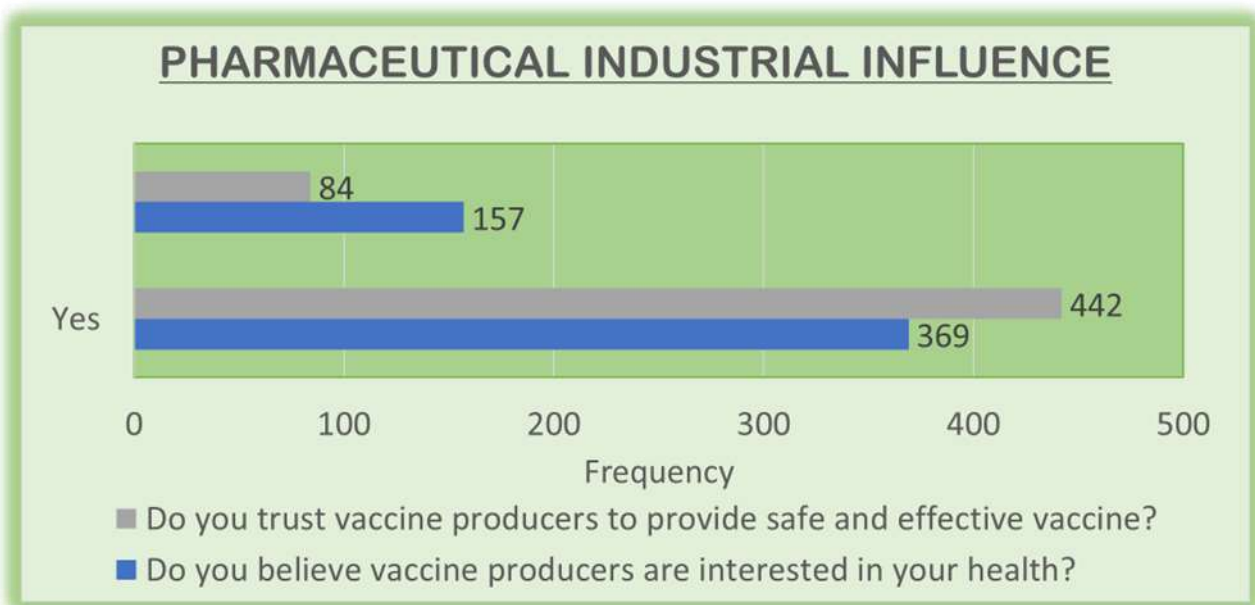


Fig 9: Pharmaceutical industrial influence in vaccine

3.9. Added Questions:

204 (38.8%) of the participants say that they are scared about the initial side effects of vaccine like fever, body ache and 322

(61.2%) of them are not. 263 (50%) of the people said that they are waiting for a better, effective vaccine to come in markets to get vaccinated and 263 (50%) deny this. [fig 10].

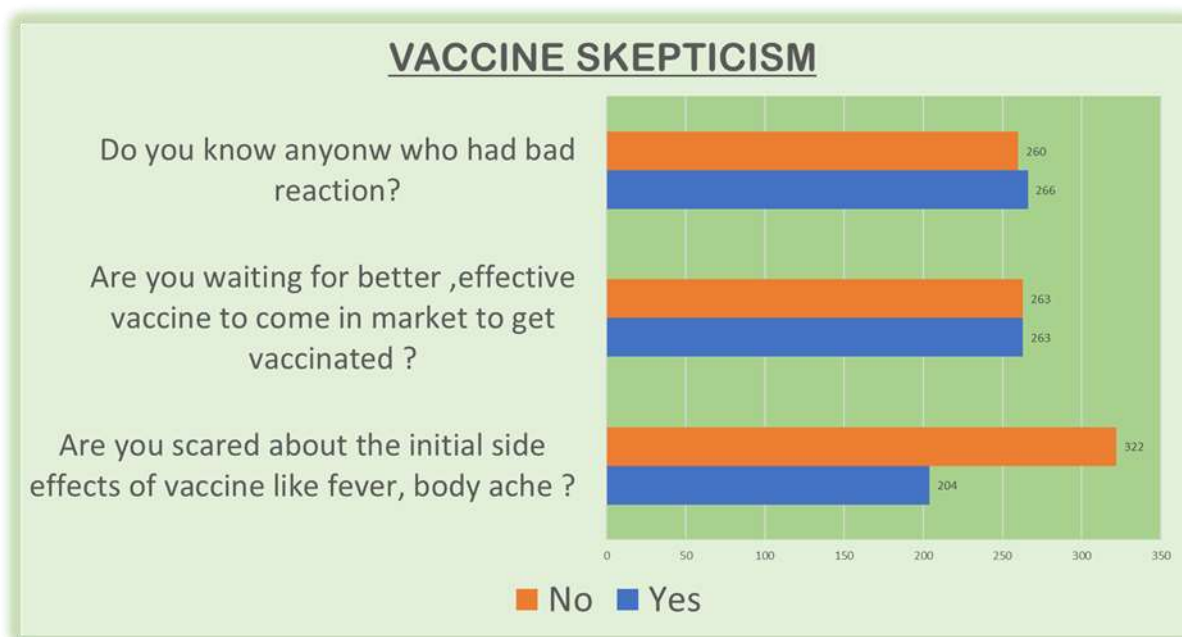


Fig 10: Vaccine skepticism and added questions.

Vaccine Skepticism Questions:

25 (4.8%) of the respondents do not at all think that the vaccine is safe, 104 (19.8%) believe that it is a little safe, 262 (49.8%) say that it is moderately safe and 135 (25.7%) agree that it is quite a bit safe. When questioned about the effectiveness of the vaccine, 22 (4.2%) participants do not think it is effective, 90 (17.1%) say that it is a little effective, 286 (54.4%) say that it is moderately effective and 128 (24.3%) agree that the vaccine is quite a bit effective. 20 (3.8%) of the study population thinks that vaccines are not at all important in the fight against COVID-19, 62 (11.8%) think that it is a little important, 217 (41.3%) think that it is moderately important and 227 (43.2%) of the respondents agree that the vaccines are quite a bit important in the fight against COVID-19.

4. DISCUSSION:

This study is sought to examine the acceptance of the COVID-19 vaccine among Indian population above 18 years of age. The study was carried out via online platforms and the questionnaire used for the survey was adapted from the questionnaire that was used in a previously conducted study to analyze the acceptance of COVID-19 vaccine.¹⁹ A total of 526 people took part in the study and for the ease of assessment, they were categorized into four age groups, 18-25 years, 26-35 years, 36-45 years and above 45 years.

This study reports that the majority of population shows acceptance of the COVID-19, however it is evident from the other study results that this rate of acceptance is not sufficient.²⁰ It is essential to identify the causes for hesitancy and ways to enhance the acceptance rates. By identification of these factors, healthcare professionals can develop techniques to strategies to work on areas that cause hesitancy among people and address their concerns. The demographical variations play a major role in determining the acceptance.²¹ They are directly linked to the knowledge of

people on vaccination and their safety as it determines the educational and understanding ability of the population. Females made up more than half of the study population. They have shown more acceptance for COVID-19 vaccines than males [p=0.004]. The area of residence of the participants were different, some were from village, the rest from towns and cities. Most of the respondents were single and had high educational qualification. Some of the healthcare professionals and also students in the health sector participated in the survey. Students have shown more acceptance for COVID-19 vaccine than working population [p=0.048].

The awareness about the existence of the pandemic was great among the study population and it shows how people have themselves updated. They feel that their professional, social and family life have seen drastic changes and the pandemic has exerted its effects in these areas. The respondents do accept that the COVID-19 pandemic is serious and this complies with the results of another study conducted on "Factors influencing COVID-19 vaccination uptake in an elderly sample in Poland".²²

We studied the attitudes and beliefs people tend to possess about the COVID-19 vaccine. The participants seem to possess good knowledge about the pandemic. More than 98 percent of the respondents involved in the study were aware about the pandemic and nearly 98 percent of them knew about the vaccine and said that they could explain what a vaccine was. 97.5 percent of the participants say that vaccine is highly essential in the fight against COVID-19.

When the candidates needed more information regarding the vaccines, 53.6 percent of them discuss it with a healthcare professional and 34.4 percent turn to the internet while the rest find it convenient in discussing it with a friend or family or their relatives. From this detail, it should be noted that people should be advised to always consult a healthcare worker to clarify their doubts on the vaccine or the disease rather than taking it to the internet or their acquaintances,

which could possibly result in the spread of false information. It is understood that the false information and the theories revolving around the COVID-19 vaccine, makes it hard to convince people to take the vaccine.²³

More than 65 percent of the people think that they are provided with sufficient information regarding the vaccines and their safety, but the rest deny this statement which tells us that the availability of information from official and authorized sources should be made accessible to everybody. There is a high chance that the people with infection could possibly infect their family members too. The lack of awareness on this information could possibly contribute to hesitancy of the vaccine as reported by a study conducted on "Caregiver willingness to vaccinate their children against COVID-19: Cross sectional survey".²⁴ More than 80 percent of the participants agree that they are risking their own health and the health of their families by avoiding the vaccine and 17 percent of them disagree with this, which implies that the seriousness of the transmission of the disease and the importance of vaccines in the treatment of the disease is still not clearly accepted by everybody. Nearly half of the candidates believe that there are better ways to prevent the diseases which are currently prevented using a vaccine and the rest do not agree with this.

93% of the participants think that a vaccine strengthens the immune system and when the participants were questioned if they ever decided not to get vaccinated themselves and 17.1% of them responded with a "yes" while 82.9% said "no". This information makes it evident that majority of the people have agreed to take the vaccine and believe that it is needed while a small population is still reluctant about this. 0.6% of them reported to have known people who had bad reactions post-vaccination and 49.4% of them didn't.

When asked the participants, how satisfied they were with their health professional's/ health worker's answers to the questions they had related to immunization, nearly 70 percent of them agreed that they were satisfied. The rest did not find it satisfactory; it should be taken care that the queries and all information regarding immunization should be cleared by the healthcare worker. Nearly 80 % candidates said that they trusted the advice offered by the healthcare professionals. 90% of the respondents agree that vaccine is essential and is highly recommended and when asked how concerned they were about the vaccine, nearly 80 percent of them said that they were concerned and the rest were not. A greater portion of the population involved in the study said that the disease was serious and many agree that it is required for them and their families to get vaccinated. 82% of them think that they are risking their own health and the health of others by not taking the vaccine and this shows that some of them still hesitate to believe that vaccines are important. Many people think it is not essential for men to get vaccinated than women while some think it is required. It should be made clear that despite the differences with age and gender, it is mandatory for everybody to get vaccinated.

70 percent of the respondents believe that the vaccine producers are really interested in the health of the public and nearly 84 percent of the people trust the vaccine producers in providing safe and effective vaccination. A small proportion of the study participants do not agree to this and do not trust the vaccine producers. This could be one of the reasons why people hesitate to take the vaccine. 61 percent have reported that they were not at all scared about the initial side effects of vaccine while the others were. This implies that many of them are still scared about the side effects. This could also be one of the reasons for people to avoid the vaccine. Half of the participants said that they were waiting for a better vaccine to

be in market so that they can get vaccinated. When questioned about the safety of the vaccine, 75% think it is safe while others think it otherwise. This is a result of the spread of false information and the lack of authorized information. 78% think that the vaccine is effective and the others don't agree with this. 84% of the participants think that vaccine is highly essential in the fight against COVID-19 and the others don't.

5. CONCLUSION:

In this COVID-19 pandemic, the most promising weapon for preventing the infection is the vaccine. The vaccines have gained prime important roles in aiding the treatment and in prevention of transmission. Majority of the population has accepted the vaccine and are ready to get vaccinated. Many people find it difficult to accept due to the lack of authorized and official information. Most of them prefer clarifying their queries regarding the vaccine from their acquaintances or the internet which could possibly result in the spread of false information. Everybody should be educated to take information from verified and standard resources. Healthcare workers should volunteer themselves in more numbers to guide the patients in vaccination and also educate them with the basic information regarding the vaccine and the minor side effects. More awareness and education about the need for vaccination and the hazards of avoiding the vaccine should be provided to people from authenticated sources, which could increase the rates of acceptance of vaccine among people.

Conflict of interest:

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