

Appendix B: Cover Page

WILLINGNESS, KNOWLEDGE AND PERCEPTION OF COVID-19 VACCINE AMONG INDIAN URBAN ADULT POPULATION

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of
Master of Business Administration (MBA)

in

Hospital and Health Management

Academic year 2019-2021

By

Suman Pattnaik

Under the Supervision and Guidance of

Dr. J.P Singh

2021

Appendix C: Title Page

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Appendix D: Declaration by Student

DECLARATION BY STUDENT

I hereby declare that this dissertation titled “Willingness, knowledge and perception of covid-19 vaccine among Indian urban adult population” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Suman Pattnaik

(Signature)

Suman Pattnaik

Name of Student

Date: 22/06/2021

WILLINGNESS, KNOWLEDGE AND PERCEPTION OF COVID-19 VACCINE AMONG INDIAN URBAN ADULT POPULATION

ABSTRACT:

Background and Objectives:

Since the launch of the COVID-19 vaccine in India, there has been hesitancy towards the vaccine due to lack of knowledge and perception. The study is conducted to assess the willingness, knowledge and perception of Indian population towards the COVID-19 vaccine to have successful vaccination program in India.

Methodology:

The study conducted is a cross sectional study where an online questionnaire google form was circulated among the participants to assess the willingness, knowledge and perception of COVID-19 vaccine among 18 and above age group of Urban Indian population.

Results:

A total 169 responses were collected from urban adults using the google form. Among 169 responses, about 90 % of participant are willing to get vaccinated ,7% answered Maybe and 3 % were not willing to get vaccinated at all. About 70% have already taken the first dose. the willingness was found to be most in the 18-30 age group, female gender and of college level education. Limited knowledge towards COVID-19 vaccine was found among the participants. Knowledge related to various aspects of vaccine was found to be between 31 % to 75 % among the participants. Only 52% knew that the vaccine is not legally mandatory and 34 % only knew about the eligibility of the vaccine for comorbid patients. Knowledge is observed to be lacking in all sociodemographic category when made the comparison. 60-80% of the participants believes that they still need to wear mask even after vaccination and that vaccination will not end the pandemic but only reduce the severity and complication of COVID-19 infection (69% of the participants).

Conclusion: Although the willingness towards vaccination is as high as 90% among people but the knowledge toward vaccine is lacking which could be an obstacle towards the successful vaccination drive. There is scope of improvement of knowledge by reducing the source of misinformation and creating awareness.

Keywords:

Immunization, COVID-19, vaccination, Acceptance, knowledge.

ACKNOWLEDGEMENT

I would like to extend my sincere thanks to our institute, The Institute of Health Management Research, Jaipur for providing us with this great opportunity of dissertation.

I express my deepest thanks to Dr J.P Singh, Professor in The IIHMR University and my mentor for giving me necessary guidance to make this research study easier. Without his support this project would not have been possible.

Sincerely,

Suman Pattnaik

MBA HM- 24

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WILLINGNESS, KNOWLEDGE AND PERCEPTION OF COVID-19 VACCINE AMONG INDIAN URBAN ADULT POPULATION

1. INTRODUCTION:

The COVID-19 pandemic has had a significant impact on people's physical, social, emotional, and behavioural well-being. People are desperate to end the pandemic, and mass vaccination appears to be a viable option. ^[2]

In India, COVID-19 immunisation began on January 16, 2021. It was first rolled out for healthcare workers and frontline workers. India had provided 208,902,445 doses in total as of May 28, 2021, including first and second doses of currently approved vaccines. ^[3]

There are two vaccines that were approved for emergency use and are available in India that is:

Covishield- which is a brand Oxford AstraZeneca vaccine. It is manufactured by the Serum Institute of India.

Covaxin- made by Bharat Biotech. ^[12]

ELIGIBILITY CRITERIA FOR THE VACCINE:

January 16th 2021: Vaccine was launched for frontline and healthcare workers.

March 1st, 2021: Over 60 years of age as well as individuals between 45 and 59 years of age with comorbid conditions.

April 1st, 2021: People above the age of 45 years (born before 1st Jan, 1977).

May 1st, 2021, all eligible citizens above the age of 18 years can get the COVID-19 vaccine. ^[4]

ACCORDING TO THE STATISTICS

At least one dosage of Covaxin or Oxford AstraZeneca vaccine has been given to 164,779,253 (16 crore) people (28 May 2021) ^[3]

About 44,123,192 (4 crore) people have received both doses of Covaxin or Oxford AstraZeneca vaccine. (28 May 2021). ^[3]

We can say only 12% of the Indian population has been vaccinated so far with one dose and 3% of Indian population is fully vaccinated since the start of the vaccine program which is quite low in comparison to the population. (28 May 2021). ^[3]

Graph of cumulative doses administered across the country [\[edit\]](#)

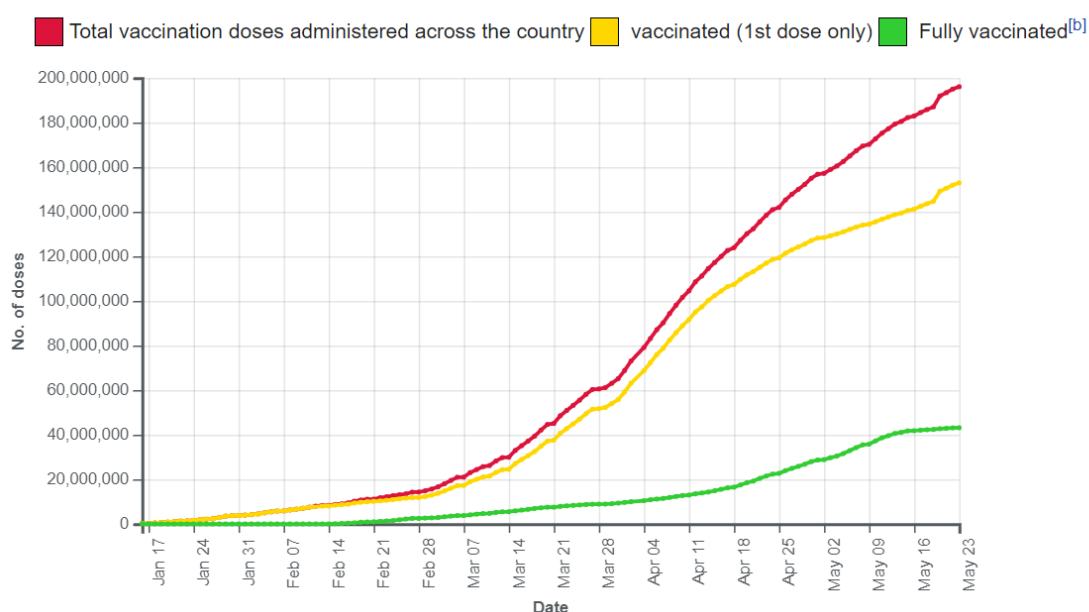


Figure 1.1: Cumulative doses administered across the country ^[3]

Even if the eligibility criteria were met for the first dose, a substantial number of people did not show up, and the same is true for the second dose of vaccine.

The duration between two Covishield vaccine doses has been increased from four-six weeks to four-eight weeks. The duration between two doses of Covaxin is about four to six weeks. ^[4]

Side effects mostly encountered by people after taking vaccine:

- Fever
- Chills
- Fatigue
- Pain in the site of injection
- Muscle pain

Vaccine acceptance was found to be around 59% - 90% and hesitancy was found to be 10 % to 30%. ^{[1], [2],[9],[10], [11]}

2. RATIONALE:

Coronavirus pandemic has gripped the whole world. The deadly second wave is causing the country's health system to almost crumbing and to prevent more loss of lives it's very important to bring down the number of cases. This can be partially achieved through vaccination. But even after months from the start of the vaccination program only 12% population has been vaccinated so far. The role of safe and effective COVID-19 vaccine in the present epidemic will be critical in the fight against COVID-19. ^[1]

For the introduction, implementation, and maintenance of any immunisation programme, vaccine acceptance is a social instrument that is vital. ^[7,8]. Accounting for people's perceptions of vaccine introduction will reveal details about their hopes and apprehensions. This will further help in understanding the barriers if faced by people. Thus, the goals of this study are to determine the current status of people's knowledge for COVID-19 vaccine, to know the preferences of respondents about this vaccine and to learn about the people's perception of the COVID-19 vaccine in India's population.

3. LITERATURE OF REVIEW:

Many studies have been undertaken to determine the willingness, knowledge and perception of COVID-19 vaccination. It's crucial to eliminate any kind of barriers of hesitancy and also to educate further about the vaccine in order to tackle the pandemic.

Farzana Islam et al (2021). “Assessment of the knowledge, preferences and concern regarding the prospective COVID- 19 vaccine among adults residing in New Delhi, India-A cross sectional study”. ^[1]

This study was performed among the adults in New Delhi to assess the individual's knowledge and preference as well as the concern with respect to the COVID-19 vaccine. The study used cross sectional study methodology. Data were collected from the participants through online and offline interview.

Result: Study showed that 79.5% of the participants were willing to get vaccinated, while 8.8% of the participant were against it and remaining 11.7% had not yet decided about it. More than half of respondents said they would pay for the vaccine, and 72% said it should be given to health workers and high-risk groups initially.

Archana Kumari and et al (2021). “Development and validation of a questionnaire to assess knowledge, attitude, practices, and concerns regarding COVID-19 vaccination among the general population”. ^[2]

This study used cross-sectional study methodology. Questionnaires were developed through the literature review and they were sent to 201 participants for evaluation. More than half of the participants were aware that vaccination is not mandatory and that it is voluntary. About 78% had the knowledge about the vaccine availability and eligibility criteria. However, only half of the participants (51.74%) were aware that individuals with comorbidities were eligible. About 59% were willing to take vaccine and recommend it. Influencing their decision to get vaccinated are perceptions that there is no harm in getting vaccinated and that the benefits exceed the risks.

Hilal HamidMir et al (2021). “Using structural equation modelling to predict Indian people’s attitudes and intentions towards COVID-19 vaccination” [5]

Study was performed to predict intention and attitude of general Indians towards COVID-19 vaccination. This study used online form with questions which was sent to 254 participants to assess how people's attitudes with Covid-19 vaccinations are affected by perceived advantages, risk perceptions and social media exposure.

Result: Participants' intentions to receive Covid-19 vaccines were mostly influenced by their overall views and opinions of Covid-19 vaccines.

Archana Kumaria, Piyush Ranjan et al (2021). “Knowledge, barriers and facilitators regarding COVID-19 vaccine and vaccination programme among the general population”. [6]

This study was a cross sectional study which used online google form to assess the knowledge, barrier and COVID-19 vaccine facilitators in Indian population. Total of 1294 responses were collected between March 13, 2021 and March 25, 2021.

Result: The majority had little knowledge of vaccination eligibility in vulnerable populations such as people with allergies (57.89%) patients with impaired immune systems (62.98 %). Older participants (>45 years) believed in the safety of the vaccine and were willing to take it whereas the younger participants (<45 years) and were concerned about the availability and authenticity of the vaccine.

Praveen SV, Rajesh Ittamalla, Gerard Deepak (2021). “Analysing the attitude of Indian citizens towards COVID-19 vaccine – A text analytics study”. [7]

This study was to analyse the attitude towards COVID-19 vaccination of Indian population. Social media posts as data were used.

Result: According to the findings, 47 % of social media posts on vaccines had a neutral tone, while approximately 17 % of social media posts about the COVID-19 vaccine had a negative tone. Fear of harm to one's health and allergic reactions to the vaccine are two major concerns among Indian residents over the COVID-19 vaccine.

Sharun Khan, C.K Faslu Rahman, Haritha C V, Bosco Jose (2020). “COVID-19 Vaccine Acceptance: Beliefs and Barriers Associated with Vaccination Among the General Population in India”. [8]

During the month of October, self-administered questionnaires were delivered to the general public as part of this study.

Result: Only 46.2 % of the 351 participants thought the COVID-19 immunisation would be effective, while 55 % thought it would be safe. The majority of the participants (86.3%) planned to receive the COVID-19 vaccine, while 13.7 % expressed reservations.

Narayana Goruntla et al (2021). “Predictors of acceptance and willingness to pay for the COVID-19 vaccine in the general public of India: A health belief model approach”. [9]

The objective of the study was to determine what factors influence public acceptance and willingness to pay for the COVID-19 vaccine in India.

Online web-based questionnaire was circulated nationwide. The online survey was completed by 2451 people out of a total of 2 480 people. Majority respondents (About 89.3%) intended to receive the COVID-19 vaccine.

Jyoti Jain, Suman Saurabh (2021). “COVID-19 vaccine hesitancy among undergraduate medical students: results from a nationwide survey in India”. [10]

This study was conducted to assess vaccine hesitancy and the factors that influence it among Indian medical students. From February 2 to March 7, 2021, 1068 medical students from 22 Indian states and union territories completed an online questionnaire.

Result: Vaccine hesitancy was detected in 10.6% of the population.

Rajesh Kumar, Mukesh Bairwa, Kalpana Beniwal, Ravi Kant (2021). “COVID 19 vaccine acceptability, determinants of potential vaccination, and hesitancy in public: A call for effective health communication”. ^[11]

This study was conducted by a tertiary care hospital on eight hundred and forty-one adults visiting. Pretested validated questionnaire on vaccine acceptability and hesitancy were given to them and was filled. Overall, 53.4% (n = 445) of participants interested to take vaccine, 27.2% (n = 229) were not sure, and the remaining 19.4% (n = 163) did not intent to vaccinate. The reason was vaccine hesitancy was included specific antivaccine attitudes and beliefs, a concern of fear and phobia, lack of information, and safety issues on the vaccine.

4. RESEARCH QUESTIONS: What is the willingness, knowledge and perception of Indian Urban adult population towards COVID-19 vaccine?

5. RESEARCH OBJECTIVES:

- To assess the knowledge and perception of Indian population towards COVID-19 vaccination.
- To assess the willingness of people towards COVID-19 vaccine.
- To identify barriers related to unwillingness and access to vaccination

6. METHODOLOGY:

The present study is carried out on urban Indian population of age group 18 and above.

Study design: Observational descriptive cross-sectional study ^[5]

Study sample: Urban Indian population of age group of 18 and above

Sampling technique: convenience

Method of data collection: Primary data was collected in the form of online google form questionnaire during the pandemic of COVID-19 for assessing the knowledge, perception and acceptance of people towards the COVID-19 vaccination. The online google form was sent to urban adults residing in different parts of country (Delhi, Mumbai, Bhubaneswar and others) and who is 18 or above which is the eligibility criteria for COVID-19 vaccination in urban India. Form was sent to more than 300 adults and 169 complete responses were collected.

Personal and social contacts were used to send the form to the participants from different regions of India.

Study Tool Used: Online google form.

Inclusion criteria: Adults of age group 18 and above.

Exclusion criteria: Children and adolescent up to age 17.

Sample Size (N): $[z^2 * p(1-p)] / e^2$

N= Unknown or large population^[1]

z = z-score = 1.96 (Confidence level = 95%)

e = margin of error = 0.05 (5%)

p = Percentage of population show acceptance towards vaccine

= 0.7 (70%). ^{[1],[2],[10],[9]}

$N = [z^2 * p(1-p)] / e^2$

= $[(1.96*1.96) \times (0.7 * 0.3)] / 0.0025$

= $[3.8416 * 0.21] / 0.0025$

= **323 (Sample Size)**

Due to very low response rate (as online data collection methodology was used) only 169 people have responded to the survey.

7. DATA ANALYSIS:

The completed questionnaires were double-checked for accuracy. The data collected were entered into MS excel. Data were plotted against pie chart and bar graph.

Chi square and fisher test is used to check the association of KAP characteristics with sociodemographic characteristics.

8. BACKGROUND CHARACTERISTICS OF THE PARTICIPANTS:

Data was collected on few background characteristics namely age, gender, and educational status of the 169 selected respondent and result of the same is given below

Age:

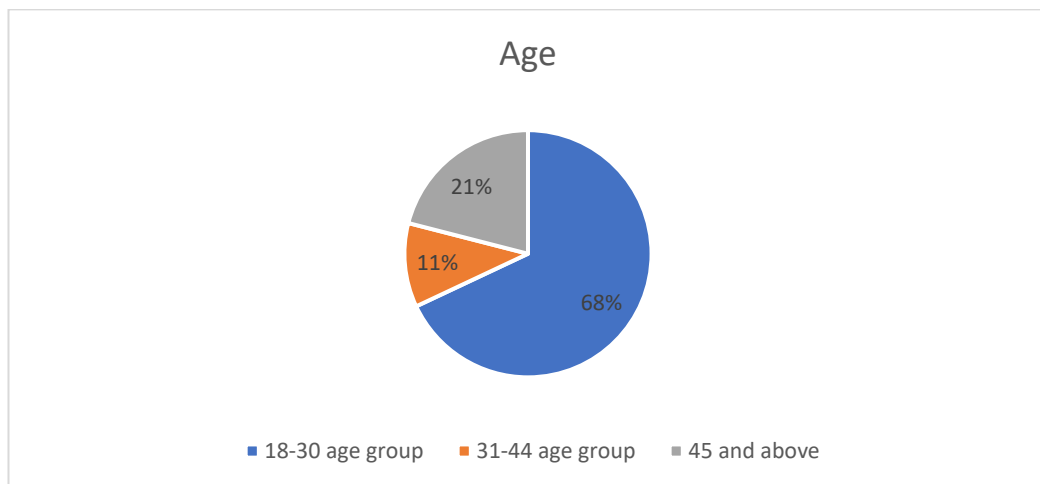


Figure 8.1: Distribution of respondent according to age

Inference: About two-third of the respondent (68%) were in the age group of 18-30 years followed by 21 percent in the age group 45 and above and remaining 11 percent belongs to in the age group of 31-44 years.

Gender:

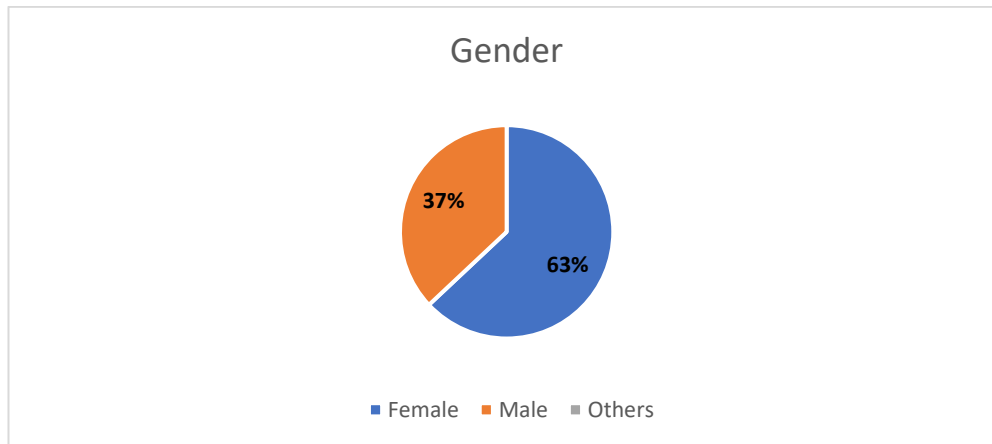


Figure 8.2: Distribution of respondent according to gender

Inference: Distribution of the respondent according to gender shows that out of 169 respondent's 63 percent were female and 37 per cent were male.

Education level:

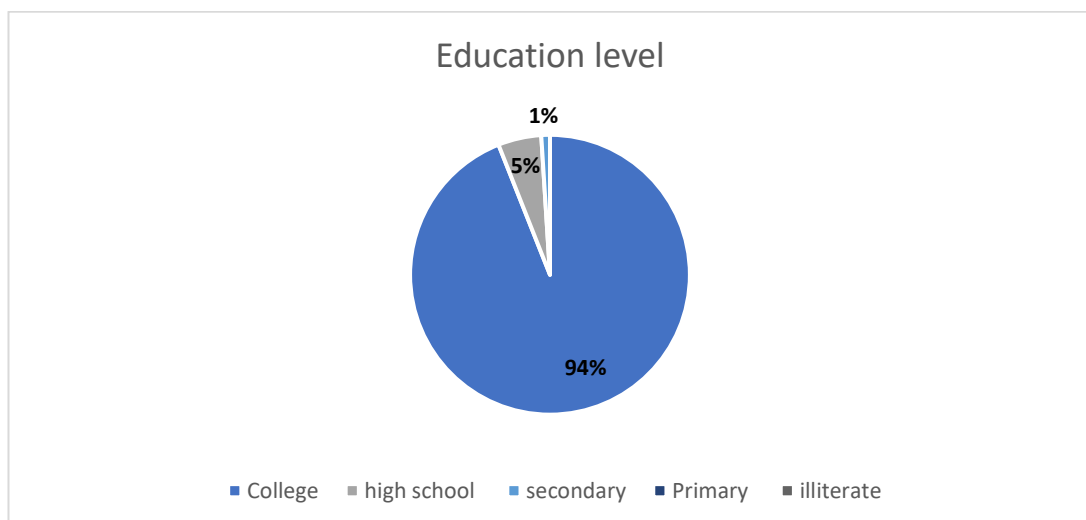


Figure 8.3: Distribution of respondents according to education level

Inference: Distribution of the respondents according to the education level shows that 94% had college level education followed by 5% had high school level education and 1% had secondary level education.

Further analysis was done to see the knowledge, perception, acceptance and barriers regarding vaccine and result is presented below.

9. RESULT AND ANALYSIS:

9.1 Knowledge:

In this part of the dissertation, we explored data to assess the knowledge of respondents regarding COVID-19 vaccine. Responses was measured on yes/no/maybe.

1. Is vaccine legally mandatory?

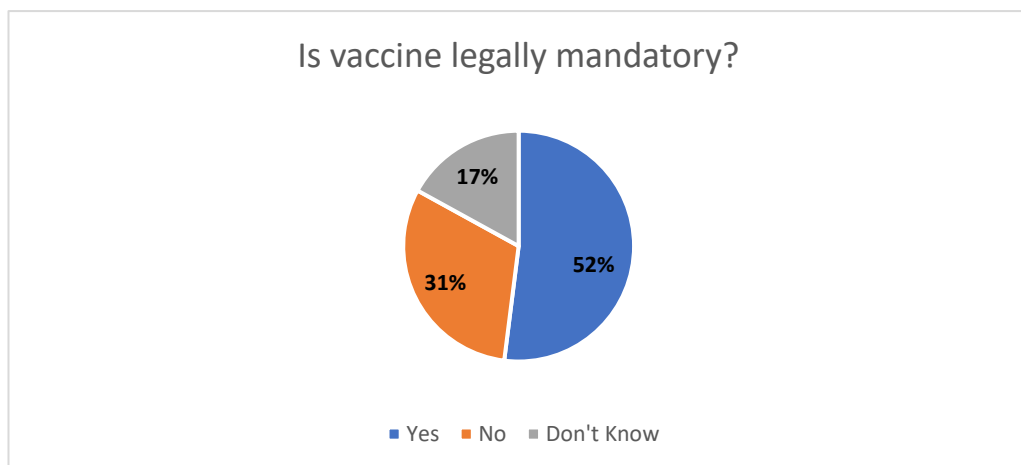


Figure 9.1.1: Percentage of respondents aware of vaccine legal criteria

Inference: About half of the respondent (52 %) knows that the vaccine is not legally mandatory followed by 31% answered yes and 17% doesn't know the answer. So about 48 % of respondents are not aware if the vaccine is legally mandatory or not.

2. When is the immunity fully achieved?

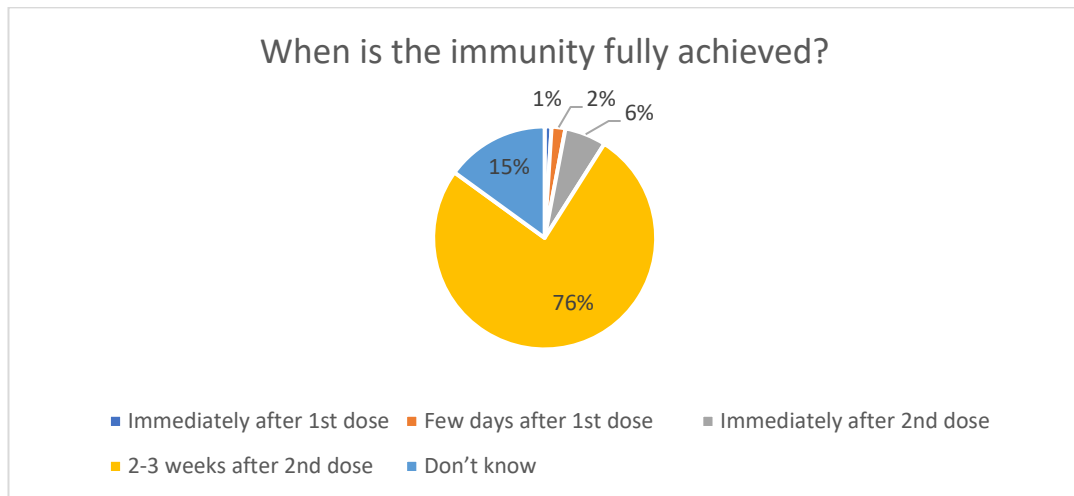


Figure 9.1.2: Percentage of respondent's knowledge about vaccine immunity

Inference: About 76 % have the knowledge of when the immunity is fully achieved that is 2-3 weeks after 2nd dose of vaccination followed by 15 % answered don't know, 6 % responded immediately after 2nd dose, 2 % responded few days after 1st dose and 1 % responded immediately after 1st dose. About 24 % lack the knowledge of when the immunity is fully achieved.

3. PCR or antigen test result will be positive if vaccinated with COVID-19 vaccine?

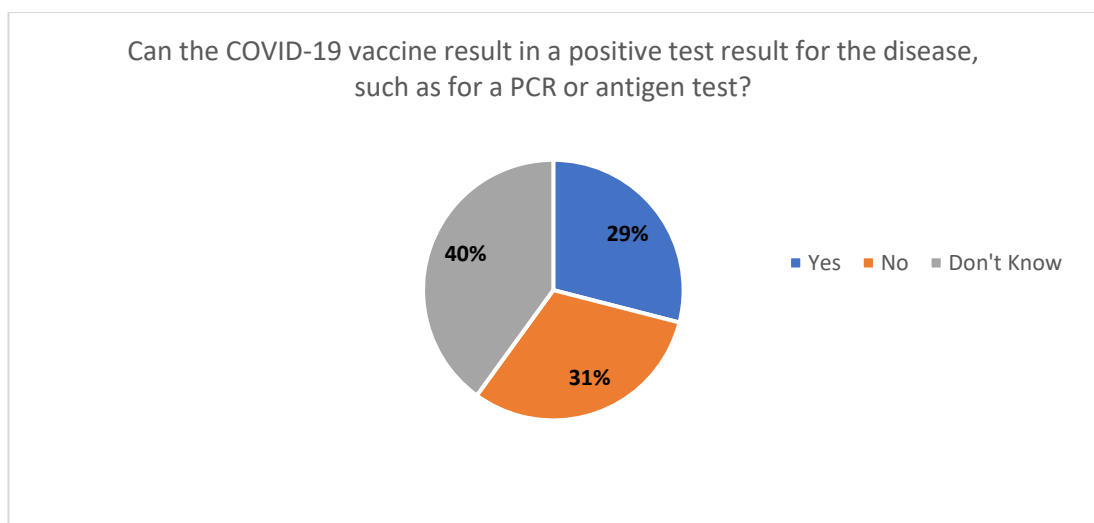


Figure 9.1.3: Percentage of respondents aware of negative result of vaccine to PCR test

Inference: About 40 % answered ‘Don’t know’ to the question followed by 31 % responded ‘No’ to this question and 29 % answered ‘Yes’.

About 69 % lack knowledge that about COVID-19 vaccine giving negative test result for the disease, such as for a PCR or antigen test.

4. Is the vaccine contraindicated in person with chronic diseases?

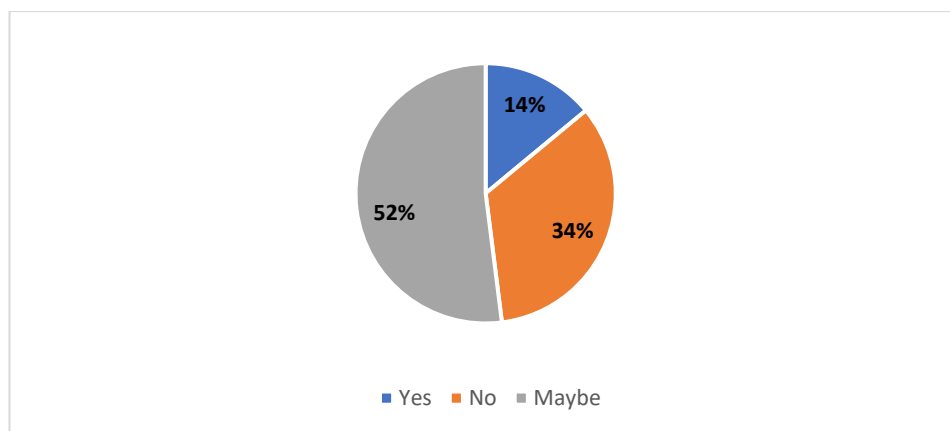


Figure 9.1.4: Percentage of respondents aware of vaccine eligibility with chronic disease

Inference: About half of the respondent (52 %) responded ‘Maybe’ the vaccine is contraindicated in person with chronic disease followed by 34 % responded ‘No’ and 14 % responded ‘Yes’ which is incorrect. About 66% of respondent lack knowledge of vaccine contraindication.

5. Should I get vaccinated if I've ever been infected with COVID-19? (≥ 3 months before)?

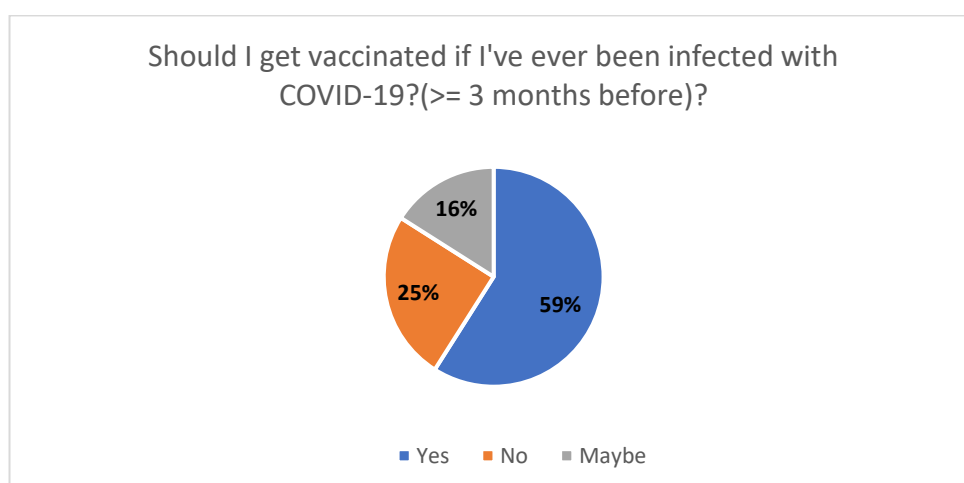


Figure 9.1.5: Percentage of respondent's aware vaccine eligibility with past infection patient

Inference: About half of respondent (59 %) responded 'Yes' that a person should get vaccinated if he/she had COVID-19 infection in the past (≥ 3 months before) followed by 25 % responded 'No' and 16 % responded 'Maybe' to the question.

Cross tabulation:

Cross tabulation of different questions on knowledge towards vaccine with sociodemographic characteristics was done to see the association of questions on knowledge towards vaccine with sociodemographic characteristics. This analysis helped us to understand whether willingness, knowledge, and perception regarding vaccine varies according to sociodemographic characteristics.

Except for question "is the vaccine legally mandatory?" all the question are non-significant to age as the p value is > 0.05 ($\chi^2 = 9.631$). It is observed that the 18-30 and 31-44 age group have slightly higher correct answer responses. Relation of knowledge with gender is non-significant as all question are p value > 0.05 . And it's observed that female and male have equal percentage of correct responses. Similarly, except for in question "Should I be vaccinated if I have had COVID-19 infection in the past (≥ 3 months before)?" all other are non-significant to education level with equal percentage responses among all the education categories.

Age:

Table 9.1.1: Cross tabulation of age with questions related to knowledge towards COVID-19 vaccine

Questions	18- 30 age group	31- 44 age group	45 and above	Total Number	p value
Is vaccine legally mandatory?					
Yes (Incorrect)	36 (32%)	2 (10%)	15 (43%)	53 (31%)	$\chi^2 = 9.631$ p= 0.036 significant
No (Correct)	61 (54%)	15 (75%)	12 (34%)	88 (52%)	
Don't Know	17 (16%)	3 (15%)	8 (23%)	28 (17%)	
When is the immunity fully achieved?					
2-3 weeks after 2nd dose (Correct)	88 (77%)	15 (75%)	25 (71%)	128 (76%)	$\chi^2 = 5.489$ p= 0.68 n.s
Don't Know	15 (13%)	3 (15%)	8 (23%)	26 (15%)	
Few days after 1st dose	3 (3%)	0 (0%)	0 (0%)	3 (2%)	
Immediately after 1st dose	1 (1%)	0(0%)	1 (3%)	2 (1%)	
Immediately after 2nd doses	7 (6%)	2 (10%)	1 (3%)	10 (6%)	
PCR or antigen test result will be positive if vaccinated with COVID-19 vaccine?					
Yes (Incorrect)	35 (31%)	7 (35%)	7 (20%)	49 (29%)	$\chi^2 = 4.240$ p= 0.374 n.s
No (Correct)	38 (33%)	6 (30%)	9 (26%)	53 (31%)	
Don't Know	41 (36%)	7 (35%)	19 (54%)	67 (40%)	
Is the vaccine contraindicated in person with chronic diseases?					
Yes (Incorrect)	15 (13%)	3 (15%)	6 (17%)	24 (14%)	$\chi^2 = 2.910$ p= 0.563 n.s
No (Correct)	44 (39%)	5 (25%)	9 (26%)	58 (34%)	
Maybe	55 (48%)	12 (60%)	20 (57%)	87 (52%)	
Should I get vaccinated if I've ever been infected with COVID-19 (>= 3 months before)?					
Yes (Correct)	71 (62%)	8 (40%)	20 (57%)	99 (59%)	$\chi^2 = 7.00$ p= 0.162 n.s
No (Incorrect)	29 (26%)	5 (25%)	9 (26%)	43 (25%)	
Maybe	14 (12%)	7 (35%)	6 (17%)	27 (16%)	
Grand Total	114	20	35	169	Grand Total

n.s = not significant

Gender:

Table 9.1.2: Cross tabulation of gender with the questions related to knowledge towards COVID-19 vaccine

Questions	Female	Male	Total Number	p value
Is vaccine legally mandatory?				
Yes (Incorrect)	34 (32%)	19 (30%)	53 (31%)	$\chi^2 = 2.707$ p = 0.258 n.s
No (Correct)	51 (48%)	37 (59%)	88 (52%)	
Don't Know	21 (20%)	7 (11%)	28 (17%)	
When is the immunity fully achieved?				
2-3 weeks after 2nd dose (Correct)	81 (76%)	47 (75%)	128 (76%)	$\chi^2 = 4.226$ p = 0.391 n.s
Don't Know	17 (16%)	9 (14%)	26 (15%)	
Few days after 1st dose	3 (3%)	0 (0%)	3 (2%)	
Immediately after 1st dose	1 (1%)	1 (2%)	2 (1%)	
Immediately after 2nd doses	4 (4%)	6 (9%)	10 (6%)	
PCR or antigen test result will be positive if vaccinated with COVID-19 vaccine?				
Yes (Incorrect)	35 (33%)	14 (22%)	49 (29%)	$\chi^2 = 4.983$ p = 0.082 n.s
No (Correct)	27 (26%)	26 (41%)	53 (31%)	
Don't Know	44 (41%)	23 (37%)	67 (40%)	
Is the vaccine contraindicated in person with chronic diseases?				
Yes (Incorrect)	13 (12%)	11 (17%)	24 (14%)	$\chi^2 = 0.881$ p = 0.643 n.s
No (Correct)	37 (35%)	21 (34%)	58 (34%)	
Maybe	56 (53%)	31 (49%)	87 (52%)	
Should I get vaccinated if I've ever been infected with COVID-19 (>= 3 months before)?				
Yes (Correct)	63 (60%)	36 (57%)	99 (59%)	$\chi^2 = 0.734$ p = 0.693 n.s
No (Incorrect)	28 (26%)	15 (24%)	43 (25%)	
Maybe	15 (14%)	12 (19%)	27 (16%)	
Grand Total	106	63	169	

n.s = not significant

Education level:

Table 9.1.3: Cross tabulation of education level with questions related to knowledge towards COVID-19 vaccine

Questions	College	High school	Secondary	Total Number	p value
Is vaccine legally mandatory?					
Yes (Incorrect)	49 (31%)	3 (38%)	1 (33%)	53 (31%)	$\chi^2 = 6.389$ p= 0.170 n.s
No (Correct)	84 (53%)	4 (50%)	0 (0%)	88 (52%)	
Don't Know	25 (16%)	1 (12%)	2 (67%)	28 (17%)	
When is the immunity fully achieved?					
2-3 weeks after 2nd dose (Correct)	120 (76%)	6 (75%)	2 (75%)	128 (76%)	$\chi^2 = 2.258$ p= 0.738 n.s
Don't Know	23 (14%)	2 (25%)	1 (25%)	26 (15%)	
Few days after 1st dose	3 (3%)	0 (0%)	0 (0%)	3 (2%)	
Immediately after 1st dose	2 (1%)	0 (0%)	0 (0%)	2 (1%)	
Immediately after 2nd doses	10 (6%)	0 (0%)	0 (0%)	10 (6%)	
PCR or antigen test result will be positive if vaccinated with COVID-19 vaccine?					
Yes (Incorrect)	47 (30%)	0 (0%)	2 (67%)	49 (29%)	$\chi^2 = 5.987$ p= 0.144 n.s
No (Correct)	50 (32%)	3 (37%)	0 (0%)	53 (31%)	
Don't Know	61 (38%)	5 (63%)	1 (33%)	67 (40%)	
Is the vaccine contraindicated in person with chronic diseases?					
Yes (Incorrect)	22 (14%)	1 (12%)	1 (33%)	24 (14%)	$\chi^2 = 3.346$ p= 0.341 n.s
No (Correct)	53 (33%)	3 (38%)	2 (67%)	58 (34%)	
Maybe	83 (53%)	4 (50%)	0 (0%)	87 (52%)	
Should I get vaccinated if I've ever been infected with COVID-19 (>= 3 months before)?					
Yes (Correct)	96 (61%)	1 (13%)	2 (67%)	99 (59%)	$\chi^2 = 9.297$ p= 0.018 significant
No (Incorrect)	38 (24%)	5 (62%)	0 (0%)	43 (25%)	
Maybe	24 (15%)	2 (25%)	1 (33%)	27 (16%)	
Grand Total	158	8	3	169	

n.s: not significant

9.2 Perception analysis:

In this part of the dissertation, we explored data to understand the perception of respondents regarding COVID-19 vaccine. Some of the perception was measured on Likert scale and some on yes/no/maybe.

1. COVID-19 vaccine is safe? (With “1- Strongly disagree, 2- Disagree, 3- Neither disagree nor agree, 4- Agree, 5- Strongly Agree”)

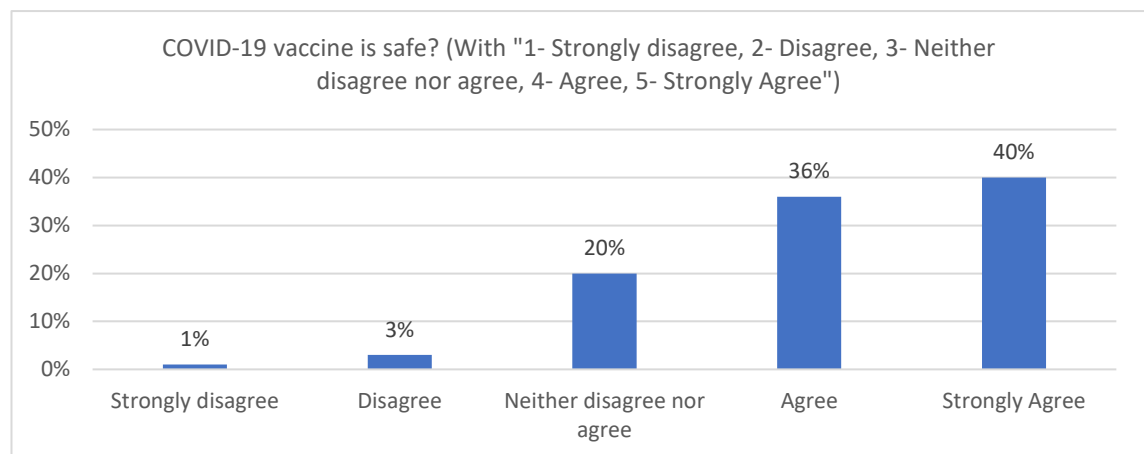


Figure 9.2.1: Percentage of respondent's perception with safety of vaccine

Inference: About 40 % strongly agrees that COVID-19 vaccine is safe, 36 % responded that they agree vaccine is safe followed by 20 % neither agreeing and neither disagreeing, 3 % disagree that vaccine is safe and 1% strongly disagreeing to the safety of vaccine.

2. Do you think the COVID-19 vaccine is effective? (With “1- Strongly disagree, 2- Disagree, 3- Neither disagree nor agree, 4- Agree, 5- Strongly Agree”)?

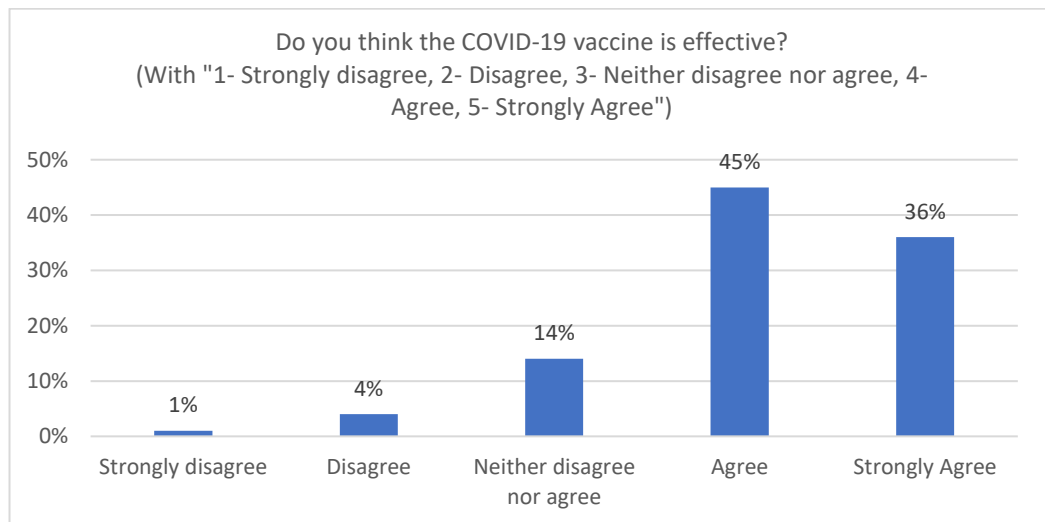


Figure 9.2.2: Percentage of respondent's percentage with vaccine effectiveness

Inference: About 45% agrees that COVID-19 vaccine is effective and one third of the respondent (36 %) strongly agrees that COVID-19 vaccine is effective followed by 14% neither disagree nor agree with the effectiveness of vaccine, 4% responded disagree and 1% respondents strongly disagree with the vaccine effectiveness.

3. Do you think vaccine prevents complication/severity of COVID-19?

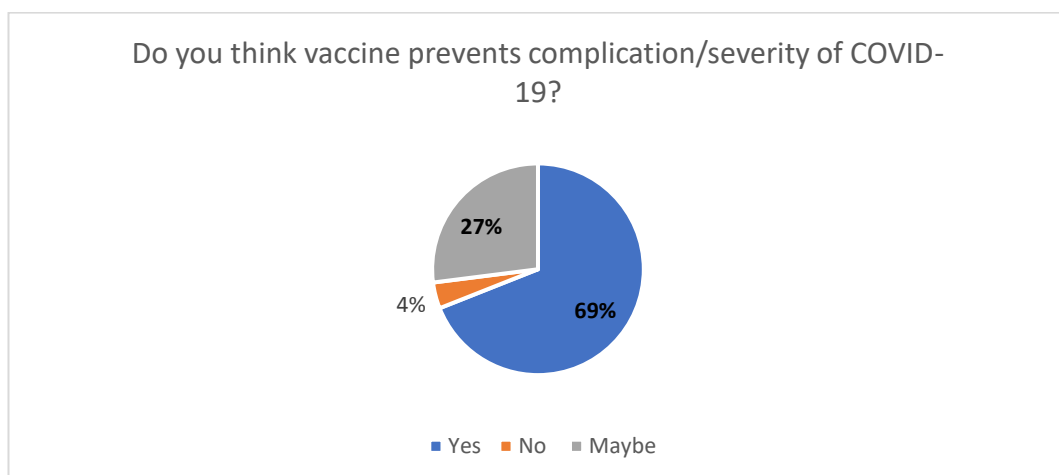


Figure 9.2.3: Percentage of respondent's perception with vaccine reducing severity

Inference: About 69 % responded 'Yes' that the vaccines will prevent severity or complication of COVID-19 infection followed by 27 % responded 'Maybe' and 4 % responded 'No'.

4. Do you believe the COVID-19 vaccine will end the pandemic?

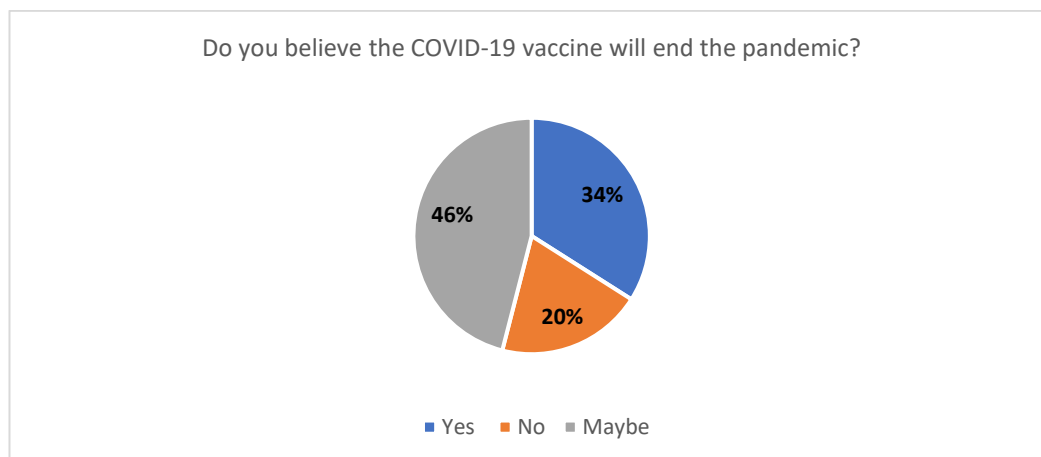


Figure 9.2.4: Percentage of respondent's perception with vaccine ending pandemic capability

Inference: About 46 % responded 'Maybe' vaccination will end the COVID-19 pandemic followed by 34 % responded 'Yes' vaccines will end the pandemic and 20 % responded 'No' it won't happen.

5. No need to wear mask or follow any COVID-19 precaution protocol after taking vaccine (With "1- Strongly disagree, 2- Disagree, 3- Neither disagree nor agree, 4- Agree, 5- Strongly Agree")

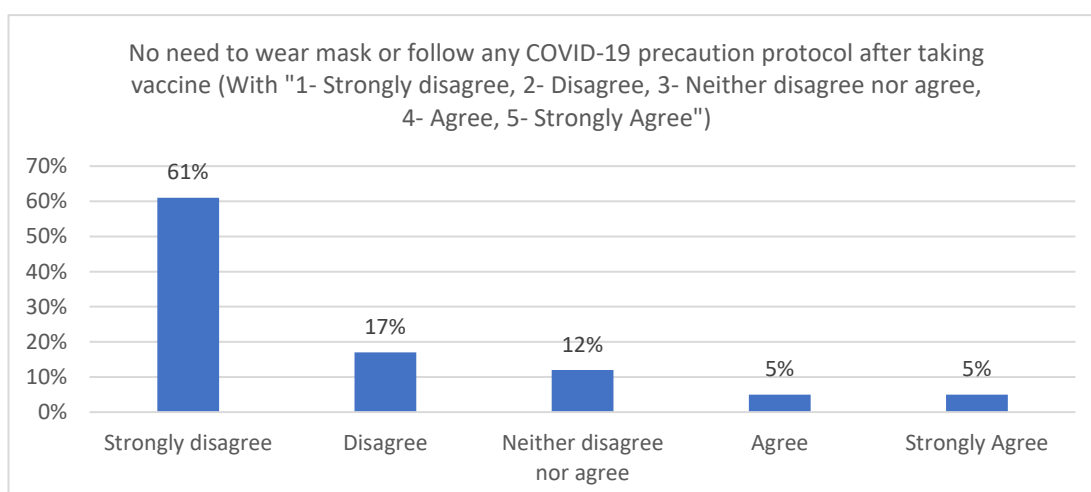


Figure 9.2.5: Percentage of respondent's perception with mask wearing after being vaccinated

Inference: Participants were asked if they think after being vaccinated if it is necessary to follow COVID-19 precaution protocol or to wear mask.

About 61 % respondent strongly disagree with the statement “No need to wear mask or follow any COVID-19 precaution protocol after taking vaccine”, 17% responded disagree followed by 12% respondent neither disagreeing nor agreeing and 5% both agreeing and strongly agreeing to the statement.

6. Perceived benefit of COVID-19 vaccine:

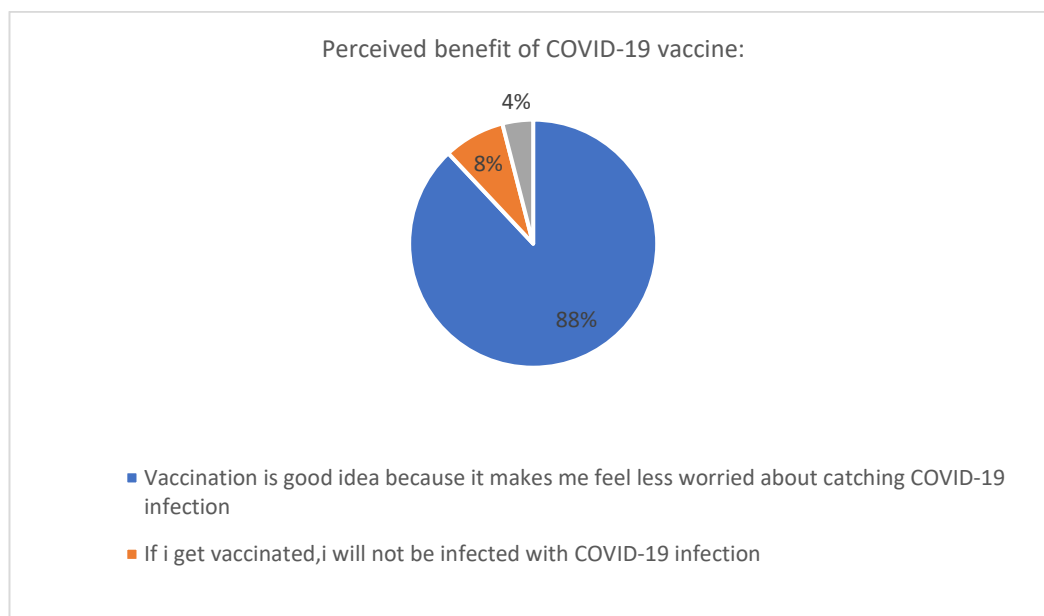


Figure 9.2.6: Percentage of respondent’s perception with vaccine benefit

Inference: About 88 % responded that vaccination is a wise decision because it will make them feel less fearful about contracting COVID-19 followed by 8 % responded with if they get vaccinated, they will not be infected with COVID-19 infection and 4 % saying there is no benefits.

Cross tabulation:

Cross tabulation of different questions on perception of COVID-19 vaccine and vaccination with sociodemographic characteristics was done to see the association of questions on perception of COVID-19 vaccine and vaccination with sociodemographic characteristics. This analysis helped us to understand whether perception regarding vaccine varies according to sociodemographic characteristics. Except for the question “Do you think vaccine prevents complication/severity of COVID-19?” all other are non-significant as p value > 0.05 to age with almost equal distribution of percentage among age except for 18-30 age group perception of vaccine reducing infection severity is

higher. Except for “Do you think COVID-19 vaccine will end the pandemic?” all other are non-significant to gender and education level with almost equal distribution.

Age:

Table 9.2.1: Cross tabulation of age with the questions related to perception towards COVID-19 vaccine

Questions	18- 30 age group	31- 44 age group	45 and above	Total Number	p value
COVID-19 vaccine is safe?					
1 -Strongly disagree	0 (0%)	0 (0%)	1 (3%)	1 (1%)	$\chi^2 = 13.089$ p= 0.109 n.s
2- Disagree	4 (3%)	2 (10%)	0 (0%)	6 (3%)	
3- Neither disagree nor agree	21 (18%)	2 (10%)	11 (31%)	34 (20%)	
4- Agree	45 (40%)	8 (40%)	8 (23%)	61 (36%)	
5- Strongly Agree	44 (39%)	8 (40%)	15 (43%)	67 (40%)	
Do you believe the COVID-19 vaccine is effective?					
1- Strongly disagree	0 (0%)	0 (0%)	2 (6%)	2 (1%)	$\chi^2 = 10.979$ p= 0.325 n.s
2- Disagree	5 (4%)	0 (0%)	2 (6%)	7 (4%)	
3- Neither disagree nor agree	16 (14%)	3 (15%)	5 (14%)	24 (14%)	
4- Agree	54 (47%)	10 (50%)	11 (31%)	75 (45%)	
5- Strongly agree	39 (35%)	7 (35%)	15 (43%)	61 (36%)	
Do you think vaccine prevents complication/severity of COVID-19?					
Yes	86 (75%)	11 (55%)	20 (57%)	117 (69%)	$\chi^2 = 11.684$ p=0.027 significant
No	3 (3%)	0 (0%)	4 (11%)	7 (4%)	
Maybe	25 (22%)	9 (45%)	11 (32%)	45 (27%)	
Do you believe the COVID-19 vaccine will end the pandemic?					
Yes	38 (33%)	7 (35%)	13 (37%)	58 (34%)	$\chi^2 = 2.178$ p= 0.703 n.s
No	26 (23%)	4 (20%)	4 (12%)	34 (20%)	
Maybe	50 (44%)	9 (45%)	18 (51%)	77 (46%)	
No need to wear mask or follow any COVID-19 precaution protocol after taking vaccine					
1- Strongly Disagree	71 (62%)	12 (60%)	19 (54%)	102 (61%)	$\chi^2 = 2.835$ p= 0.94 n.s
2- Disagree	20 (17%)	3 (15%)	6 (17%)	29 (17%)	
3- Neither disagree nor agree	13 (12%)	2 (10%)	5 (14%)	20 (12%)	
4- Agree	6 (5%)	1 (5%)	2 (6%)	9 (5%)	
5- Strongly agree	4 (4%)	2 (10%)	3 (9%)	9 (5%)	
Perceived benefit of COVID-19 vaccine:					
vaccination is a wise decision because it will make me feel less fearful about contracting COVID-19	104 (92%)	17 (85%)	27 (77%)	148 (88%)	$\chi^2 = 8.777$ p= 0.065 n.s
No benefits	5 (4%)	1 (5%)	1 (3%)	7 (4%)	
If I get vaccinated, I will not get COVID-19 infection	5 (4%)	2 (10%)	7 (20%)	14 (8%)	

Grand Total	114	20	35	169
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n.s = non-significant

Table 4 continued

Table 9.2.2: Cross tabulation of gender with the question related to perception towards COVID-19 vaccine

Question	Female	Male	Total Number	p value
COVID-19 vaccine is safe?				
1 -Strongly disagree	0 (0%)	1 (2%)	1 (1%)	$\chi^2 = 4.557$ p= 0.318 n.s
2- Disagree	3 (3%)	3 (5%)	6 (3%)	
3- Neither disagree nor agree	24 (23%)	10 (15%)	34 (20%)	
4- Agree	41 (39%)	20 (32%)	61 (36%)	
5- Strongly Agree	38 (35%)	29 (46%)	67 (40%)	
Do you believe the COVID-19 vaccine is effective?				
1- Strongly disagree	1 (1%)	1 (1%)	2 (1%)	$\chi^2 = 4.414$ p= 0.309 n.s
2- Disagree	5 (5%)	2 (3%)	7 (4%)	
3- Neither disagree nor agree	19 (18%)	5 (9%)	24 (14%)	
4- Agree	47 (44%)	28 (44%)	75 (44%)	
5- Strongly agree	34 (32%)	27 (43%)	61 (37%)	
Do you think vaccine prevents complication/severity of COVID-19?				
Yes	75 (71%)	42 (67%)	117 (69%)	$\chi^2 = 0.331$ p= 0.800 n.s
No	4 (4%)	3 (5%)	7 (4%)	
Maybe	27 (25%)	18 (28%)	45 (27%)	
Do you believe the COVID-19 vaccine will end the pandemic?				
Yes	27 (25%)	31 (49%)	58 (34%)	$\chi^2 = 9.882$ p= 0.007 significant
No	24 (23%)	10 (16%)	34 (20%)	
Maybe	55 (52%)	22 (35%)	77 (46%)	
No need to wear mask or follow any COVID-19 precaution protocol after taking vaccine				
1- Strongly Disagree	68 (64%)	34 (54%)	102 (61%)	$\chi^2 = 3.414$ p= 0.490 n.s
2- Disagree	18 (17%)	11 (17%)	29 (17%)	
3- Neither disagree nor agree	10 (9%)	10 (16%)	20 (12%)	
4- Agree	4 (4%)	5 (8%)	9 (5%)	
5- Strongly agree	6 (6%)	3 (5%)	9 (5%)	
Perceived benefit of COVID-19 vaccine:				
Vaccination is a wise decision because it will make me feel less fearful about contracting COVID-19	94(89%)	54 (86%)	148 (88%)	$\chi^2 = 0.319$ p= 0.811 n.s
No benefits	4 (4%)	3 (5%)	7 (4%)	
If I get vaccinated, I will not get COVID-19 infection	8 (7%)	6 (9%)	14 (8%)	
Grand Total	106	63	169	

n.s = non-significant

Education level:

Table 9.2.3: Cross tabulation of education level with the question related to perception towards COVID-19 vaccine

Question	College	High school	Secondary	Total Number	p value
COVID-19 vaccine is safe?					
1 -Strongly disagree	1 (1%)	0 (0%)	0 (0%)	1 (1%)	$\chi^2 = 3.089$ p= 0.658 n.s
2- Disagree	5 (3%)	1 (12%)	0 (0%)	6 (3%)	
3- Neither disagree nor agree	32 (20%)	1 (13%)	1 (33%)	34 (20%)	
4- Agree	58 (37%)	2 (25%)	1 (33%)	61 (36%)	
5- Strongly Agree	62 (39%)	4 (50%)	1 (34%)	67 (40%)	
Do you believe the COVID-19 vaccine is effective?					
1- Strongly disagree	2 (1%)	0 (0%)	0 (0%)	2 (1%)	$\chi^2 =5.095$ p=0.525 n.s
2- Disagree	7 (5%)	0 (0%)	0 (0%)	7 (4%)	
3- Neither disagree nor agree	22 (14%)	1 (13%)	1 (33%)	24 (14%)	
4- Agree	71 (45%)	2 (25%)	2 (67%)	75 (45%)	
5- Strongly agree	56 (35%)	5 (62%)	0 (0%)	61 (36%)	
Do you think vaccine prevents complication/severity of COVID-19?					
Yes	109 (69%)	6 (75%)	2 (75%)	117 (69%)	$\chi^2 =0. 589$ p= 1.00 n.s
No	7 (4%)	0 (0%)	0 (0%)	7 (4%)	
Maybe	42 (27%)	2 (25%)	1 (25%)	45 (27%)	
Do you believe the COVID-19 vaccine will end the pandemic?					
Yes	51 (32%)	7 (87%)	0 (0%)	58 (34%)	$\chi^2 =14.06$ p= 0.007 significant
No	34 (22%)	0 (0%)	0 (0%)	34 (20%)	
Maybe	73 (46%)	1 (13%)	3 (100%)	77 (46%)	
No need to wear mask or follow any COVID-19 precaution protocol after taking vaccine					
1- Strongly Disagree	98 (62%)	3 (38%)	1 (33%)	102 (61%)	$\chi^2 =13.153$ p= 0.064 n.s
2- Disagree	27 (17%)	2 (26%)	0 (0%)	29 (17%)	
3- Neither disagree nor agree	19 (12%)	1 (12%)	0 (0%)	20 (12%)	
4- Agree	7 (5%)	1 (12%)	1 (33%)	9 (5%)	
5- Strongly agree	7 (5%)	1 (12%)	1 (34%)	9 (5%)	
Perceived benefit of COVID-19 vaccine:					
Vaccination is a wise decision because it will make me feel less fearful about contracting COVID-19	139 (88%)	7 (87%)	2 (75%)	148 (88%)	$\chi^2 = 7.122$ p= 0.235 n.s
No benefits	6 (4%)	0 (0%)	1 (25%)	7 (4%)	
If I get vaccinated, I will not get COVID-19 infection	13 (8%)	1 (13%)	0 (0%)	14 (8%)	
Grand Total	158	8	3	169	

n.s= non-significant

9.3 Willingness:

In this part of the dissertation, we explored data to assess the willingness of respondents regarding COVID-19 vaccine. Some of the responses were measured on yes/no/maybe.

1. Have you been vaccinated with first dose?

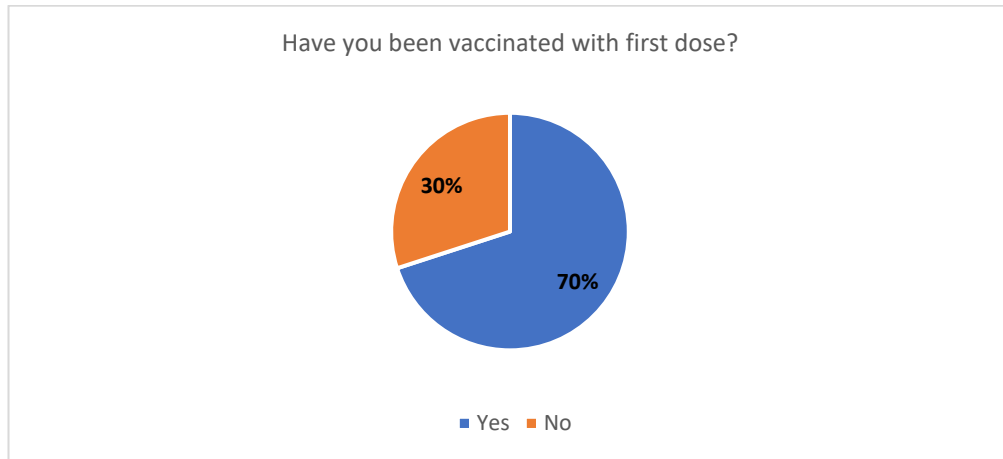


Figure 9.3.1: Percentage of respondent vaccinated with first dose

Inference: About 70% responded 'Yes' that they have taken the first dose and 30% responded 'No' haven't take the first dose of COVID-19 vaccine yet.

2. Are you fully vaccinated (2 doses)?

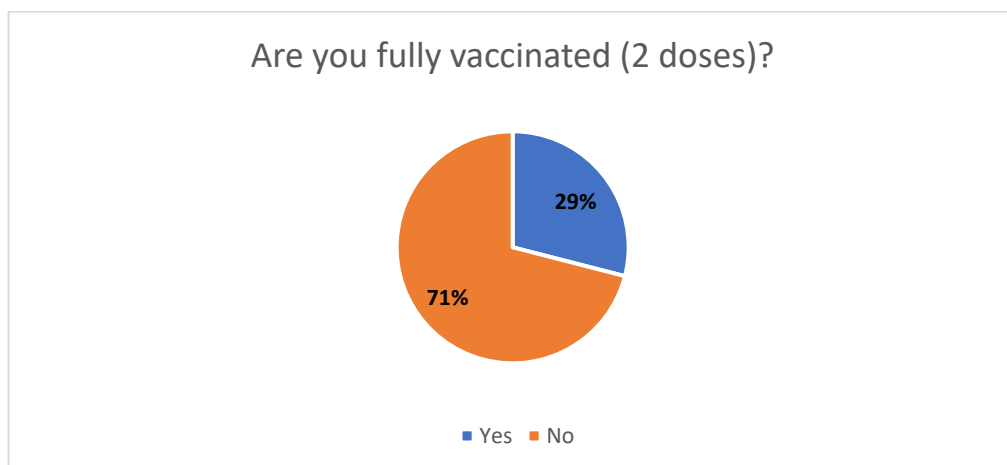


Figure 9.3.2: Percentage of respondents fully vaccinated

Inference: About 71 % responded 'No' they haven't taken the 2nd dose yet and 29 % responded 'Yes' they are fully vaccinated with 2 doses.

3. If No, are you willing to get vaccinated?

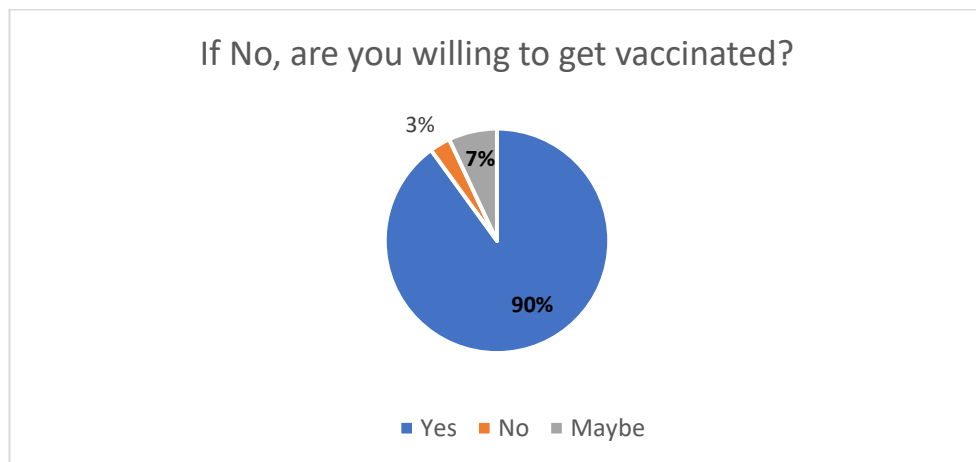


Figure 9.3.3: Percentage of respondents willing to get vaccinated

Inference: 97 respondents have answered this question who have either been vaccinated with at most one dose or not vaccinated at all.

About 90 % responded 'Yes' they are willing to get vaccinated followed by 7% responded 'Maybe' and 3 % responded 'No' they were not willing to get vaccinated.

4. Which COVID-19 vaccine do you prefer?

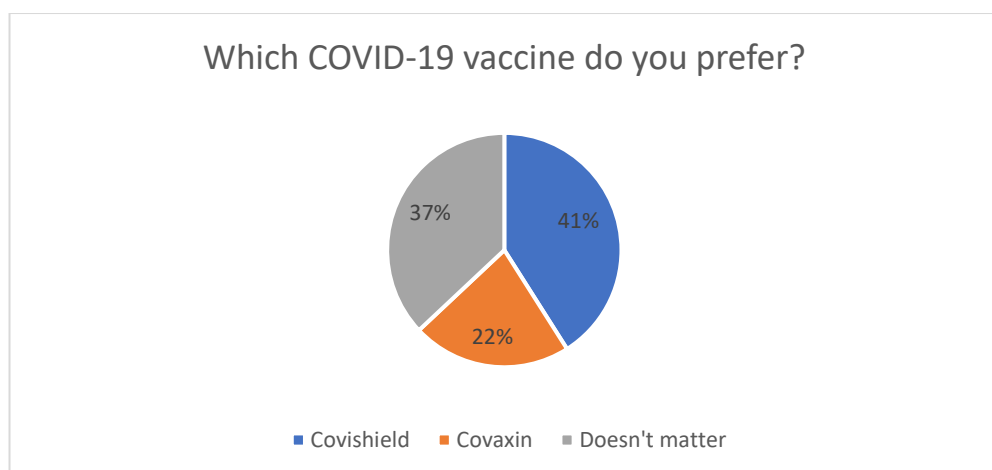


Figure 9.3.4: Percentage of respondent's preference of vaccine

Inference: About 41 % responded Covishield followed by 37 % responded doesn't matter which vaccine and 22 % (34 respondents) prefers Covaxin out of 157 responses.

Cross tabulation:

Cross tabulation of different questions on willingness towards COVID-19 vaccine with sociodemographic characteristics was done to see the association of questions on willingness towards COVID-19 vaccine with sociodemographic characteristics. This analysis helped us to understand whether willingness regarding vaccine varies according to sociodemographic characteristics.

Except for “Which COVID-19 vaccine do you prefer?” all other question is significant to age ($p \leq 0.05$) with slightly higher acceptance observed in 18-30 age group and with most of the 45 and above age group being vaccinated. Whereas except for “Are you fully vaccinated (2 doses)?” all the other are non-significant ($p > 0.05$) to gender with equal distribution of percentage. Similarly, all questions are non-significant to education level.

Age:

Table 9.3.1: Cross tabulation of age with questions related to willingness towards COVID-19 vaccine

Questions	18- 30 age group	31- 44 age group	45 and above	Total Number	p value
Have you been vaccinated with first dose?					
Yes	69 (60%)	16 (80%)	33 (94%)	118 (70%)	$\chi^2 = 15.59$ $p = 0.000$ significant
No	45 (40%)	4 (20%)	2 (6%)	51 (30%)	
Are you fully vaccinated (2 doses)?					
Yes	15 (13%)	6 (30%)	28 (80%)	49 (29%)	$\chi^2 = 58.125$ $p = 0.000$ significant
No	99 (87%)	14 (70%)	7 (20%)	120 (71%)	
Grand Total	114	20	35	169	
If No, are you willing to get vaccinated?					
Yes	66 (93%)	6 (76%)	15 (83%)	87 (90%)	$\chi^2 = 36.208$ $p = 0.000$ significant
No	2 (3%)	1 (12%)	0 (0%)	3 (3%)	
Maybe	3 (4%)	1 (12%)	3 (17%)	7 (7%)	
Grand Total	71	8	18	97	
Which COVID-19 vaccine do you prefer?					
Covaxin	21 (20%)	3 (16%)	10 (31%)	34 (22%)	$\chi^2 = 3.248$ $p = 0.779$ n.s
Covishield	47 (44%)	8 (42%)	10 (31%)	65 (41%)	
Doesn't matter	38 (36%)	8 (42%)	12 (38%)	58 (37%)	
Grand Total	106	19	32	157	

n.s = non-significant

Gender:

Table 9.3.2: Cross tabulation of gender with questions related to willingness towards COVID-19 vaccine

Questions	Female	Male	Total Number	p value
Have you been vaccinated with first dose?				
Yes	79 (75%)	39 (62%)	118 (70%)	$\chi^2 = 2.988$ p= 0.083 n.s
No	27 (25%)	24 (38%)	51 (30%)	
Are you fully vaccinated (2 doses)?				
Yes	25 (24%)	24 (38%)	49 (29%)	$\chi^2 = 4.041$ p= 0.044 significant
No	81 (76%)	39 (62%)	120 (71)	
Grand Total	106	63	169	
If No, are you willing to get vaccinated?				
Yes	54 (92%)	33 (87%)	87 (90%)	$\chi^2 = 4.093$ p= 0.226 n.s
No	2 (3%)	1 (3%)	3 (3%)	
Maybe	3 (5%)	4 (10%)	7 (7%)	
Grand Total	59	38	97	
Which COVID-19 vaccine do you prefer?				
Covaxin	20 (20%)	14 (24%)	34 (22%)	$\chi^2 = 1.013$ p= 0.803 n.s
Covishield	39 (40%)	26 (44%)	65 (41%)	
Doesn't matter	39 (40%)	19 (32%)	58 (37%)	
Grand Total	98	59	157	

n.s = non-significant

Education level:

Table 9.3.3: Cross tabulation of education level with willingness towards COVID-19 vaccine

Questions	College	High school	Secondary	Total Number	p value
Have you been vaccinated with first dose?					
Yes	112 (71%)	5 (62%)	1 (25%)	118 (70%)	$\chi^2 = 2.184$ p= 0.291 n.s
No	46 (29%)	3 (38%)	2 (75%)	51 (30%)	
Are you fully vaccinated (2 doses)?					
Yes	47 (30%)	1 (13%)	1 (25%)	49 (29%)	$\chi^2 = 1.128$ p= 0.643 n.s
No	111 (70%)	7 (87%)	2 (75%)	120 (71%)	
Grand Total	158	8	3	169	
If No, are you willing to get vaccinated?					
Yes	80 (89%)	4 (100%)	3 (100%)	87 (90%)	$\chi^2 = 8.351$ p= 0.303 n.s
No	3 (3%)	0 (0%)	0 (0%)	3 (3%)	
Maybe	7 (8%)	0 (0%)	0 (0%)	7 (7%)	
Grand Total	90	4	3	97	
Which COVID-19 vaccine do you prefer?					
Covaxin	33 (23%)	0 (0%)	1 (33%)	34 (22%)	$\chi^2 = 5.890$ p= 0.471 n.s
Covishield	58 (40%)	6 (75%)	1 (33%)	65 (41%)	
Doesn't matter	55 (37%)	2 (25%)	1 (34%)	58 (37%)	
Grand Total	146	8	3	157	

n.s = non-significant

9.4 Barrier:

In this part of the dissertation, we explored data to understand the barriers and options related to COVID-19 vaccine willingness. Participants were questioned why they haven't been vaccinated yet and what could encourage them to opt for vaccination. Responses were measured on different choice.

1. If No, Why haven't you taken the vaccine? (Multiple choice)?

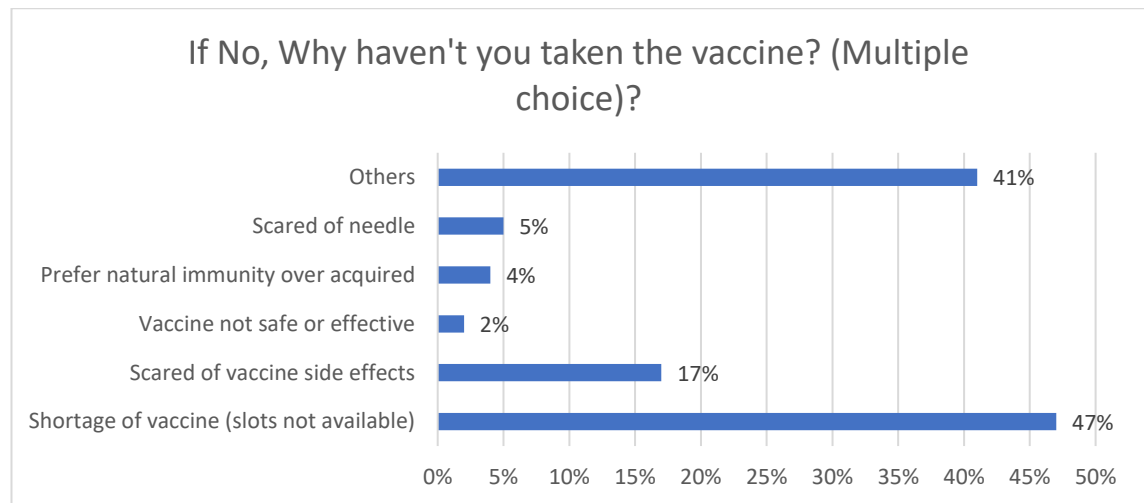


Figure 9.4.1: Percentage of respondent's unwillingness

Inference: Respondents were allowed to choose multiple options of reasons. 52 respondents were recorded.

About 47% responded shortage of vaccine (slots not available), 41% responded others, 17% responded scared of vaccine side effects, 5% responded scared of needle, followed by 4% responded prefer natural immunity over acquired and 2% responded vaccine not safe or effective.

2. Option that can encourage me to take vaccine (if not vaccinated): Multiple choice

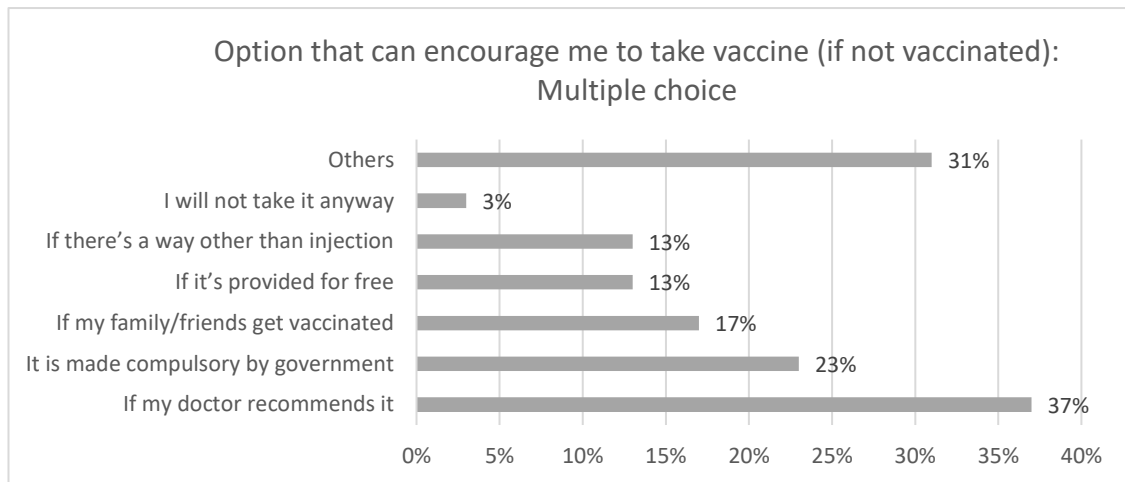


Figure 9.4.2: Percentage of respondent's option that can encourage them to get vaccinated

Inference: About 62 responses were recorded. About 37% responded if their doctor recommends it, 31% responded others, 23% responded if it is made compulsory by the government, 17% if their friends or family takes it, 13 % if it is provided for free followed by 13 % if there's any other way other than injection and 3 % said they will not take it anyway.

Cross tabulation:

Cross tabulation of different questions on barriers and solution to accept COVID-19 vaccine with sociodemographic characteristics was done to see the association of questions on barriers and solution with sociodemographic characteristics. This analysis helped us to understand whether unwillingness regarding vaccine varies according to sociodemographic characteristics. It is observed that barrier and suggestions are non-significant to age, gender and education level as the p value >0.05 .

Age:

Table 9.4.1: Cross tabulation of age with questions related to barriers and options

Questions	18- 30 age group	31- 44 age group	45 and above	Total Number	p value
If No, Why haven't you taken the vaccine?					
Shortage of vaccine (slots not available)	19 (43%)	1 (25%)	2 (50%)	22 (42%)	$\chi^2 = 23.987$ p= 0.288 n.s
Scared of vaccine side effects	6 (17%)	1 (25%)	1 (25%)	8 (15%)	
Vaccine not safe or effective	0 (0%)	1 (25%)	0 (0%)	1 (2%)	
Prefer natural immunity over acquired	1 (2%)	0 (0%)	1 (25%)	2 (4%)	
Scared of needle	2 (4%)	0 (0%)	0 (0%)	2 (4%)	
Others	16 (4%)	1 (25%)	0 (0%)	17 (33%)	
Grand total	44	4	4	52	
Option that can encourage me to take vaccine (if not vaccinated):					
If my doctor recommends it	20 (27%)	1 (20%)	1 (20%)	22 (27%)	$\chi^2 = 24.076$ p= 0.938 n.s
It is made compulsory by government	12 (17%)	1 (20%)	1 (20%)	14 (17%)	
If my family/friends get vaccinated	10 (14%)	0 (0%)	1 (20%)	11 (13%)	
If it's provided for free	8 (11%)	1 (20%)	0 (0%)	9 (11%)	
If there's a way other than injection	8 (11%)	1 (20%)	1 (20%)	10 (13%)	
I will not take it anyway	2 (3%)	0 (0%)	0 (0%)	2 (2%)	
Others	12 (17%)	1 (20%)	1 (20%)	14 (17%)	
Grand total	72	5	5	82	

n.s = non-significant

Gender:

Table 9.4.2: Cross tabulation of gender with question related to barriers and options

Questions	Female	Male	Total Number	p value
If No, Why haven't you taken the vaccine?				
Shortage of vaccine (slots not available)	13 (42%)	9 (43%)	22 (42%)	$\chi^2 = 10.132$ p= 0.404 n.s
Scared of vaccine side effects	4 (13%)	4 (19%)	8 (15%)	
Vaccine not safe or effective	0 (0%)	1 (5%)	1 (2%)	
Prefer natural immunity over acquired	0 (0%)	2 (9%)	2 (4%)	
Scared of needle	2 (6%)	0 (0%)	2 (4%)	
Others	12 (39%)	5 (24%)	17 (33%)	
Grand total	31	21	52	
Option that can encourage me to take vaccine (if not vaccinated):				
If my doctor recommends it	15 (32%)	7 (21%)	22 (28%)	$\chi^2 = 14.072$ p= 0.844 n.s
It is made compulsory by government	9 (18%)	5 (15%)	14 (17%)	
If my family/friends get vaccinated	4 (8%)	7 (21%)	11 (13%)	
If it's provided for free	6 (12%)	3 (10%)	9 (11%)	
If there's a way other than injection	6 (12%)	4 (12%)	10 (12%)	
I will not take it anyway	0 (0%)	2 (6%)	2 (2%)	
Others	9 (18%)	5 (15%)	14 (17%)	
Grand total	49	33	82	

n.s= non-significant

Education level:

Table 9.4.3: Cross tabulation of education level with questions related to barriers and options

Questions	College	High school	Secondary	Total Number	p value
If No, Why haven't you taken the vaccine?					
Shortage of vaccine (slots not available)	18 (38%)	2 (75%)	2 (100%)	22 (42%)	$\chi^2 = 11.781$ p= 0.396 n.s
Scared of vaccine side effects	8 (18%)	0 (0%)	0 (0%)	8 (15%)	
Vaccine not safe or effective	1 (2%)	0 (0%)	0 (0%)	1 (2%)	
Prefer natural immunity over acquired	2 (4%)	0 (0%)	0 (0%)	2 (4%)	
Scared of needle	2 (4%)	0 (0%)	0 (0%)	2 (4%)	
Others	16 (34%)	1 (25%)	0 (0%)	17 (33%)	
Grand total	47	3	2	52	
Option that can encourage me to take vaccine (if not vaccinated):					
If my doctor recommends it	21 (27%)	1(33%)	0 (0%)	22 (27%)	$\chi^2 = 31.790$ p= 0.228 n.s
It is made compulsory by government	14 (18%)	0 (0%)	0 (0%)	14 (17%)	
If my family/friends get vaccinated	11 (14%)	0 (0%)	0 (0%)	11 (14%)	
If it's provided for free	7 (9%)	1(33%)	1 (50%)	9 (11%)	
If there's a way other than injection	9 (12%)	1(34%)	0 (0%)	10 (12%)	
I will not take it anyway	2 (3%)	0 (0%)	0 (0%)	2 (2%)	
Others	13 (17%)	0 (0%)	1 (50%)	14 (17%)	
Grand total	77	3	2	82	

n.s= non-significant

10. DISCUSSION:

This study is conducted to know the current willingness, knowledge and perception towards COVID-19 vaccine among Urban Indian population.

Knowledge:

The knowledge of COVID-19 vaccine is however considered to be somewhat lacking in the participants. In this study only 52% knew that the vaccine is not legally mandatory similarly in **Archana Kumari et al** study, the participants knowledge was found to be 59 %.^[2]

The percentage of knowledge is lower than **Archana Kumari et al** study where 75% knew that recovered COVID patients are eligible for COVID-19 vaccines but only 52% of the participant were aware that the people with co-morbidity are also eligible. In this study the 34 % only knew about the eligibility of the vaccine for comorbid patients and 58 % knew that a recovered COVID-19 is also eligible. Majority of the participant knew that the immunity is achieved after 2-3 weeks after vaccination. Whereas in other studies about 49% believed that the immunity is achieved after 14 days of first dose of vaccination.^[2]

In every question the knowledge was found to be only 31 % to 75 % among the participants. People's lack of information of the COVID-19 vaccine could be another obstacle to the immunisation campaign's success. Lack of knowledge among people can lead them to not follow COVID-19 protocols or also spreading of false information among individuals who are yet to be vaccinated and can in turn lead to hesitancy. Knowledge is observed to be lacking mostly in both female genders and in all sociodemographic category.

Perception:

Although the willingness is quite higher in the population but the perception about efficiency and safety about the vaccine is only slightly positive towards. However, most of the participants (60-80%) believes that they still need to wear mask even after vaccination and that vaccination will not end the pandemic but only reduce the severity

and complication of COVID-19 infection (69% of the participants). In study conducted by **Farzana Islam et al** about one-third of the participant said that the vaccine is not that effective not the protection will not be for all alike and also some were trying to find any other alternate medium like homeopathy (12%) or Ayurveda (16%).^[1] In this study the perception towards vaccine effectiveness was found to be higher (about 70-80%) strongly agreeing and agreeing to the effectiveness whereas in study conducted by **Sharun Khan et al** about 46% of the participants believed the vaccine will be effective.^[8]

Acceptance-

Among the respondents about 90% were willing to get vaccinated, 7% answered Maybe and 3 % were not willing to get vaccinated. The acceptance is considered to be higher when compared to few other studies.

In one of the studies which was conducted by **Archana Kumari et al** to know the acceptance level and knowledge of Indian population it was found to be only 59% were willing to take vaccine and recommend it.^[2] The study conducted by **Narayana Goruntla et al** had About 89% of acceptance rate which is similar to this study.^[9]

Another study by **Jyoti Jain et al** which was conducted to know the vaccine hesitancy in undergraduate medical students, 10 % of respondents showed vaccine hesitancy.^[10]

Willingness to vaccination is observed to be highest than other developed as well as developing nations like studies in US where the acceptance is 67% and in Indonesia it was around 67 -93%.^{[13],[14]}

Willingness was seen more in 18-30 age group and female. And barrier was noticed to be most of shortage of vaccine and scared of vaccine side effect in female of 18-30 age group of college level education. The solution or option to encourage them was noted to be if their family/friends take it or their doctor recommend it.

This will help to vaccinate the entire population as any kind of hesitancy can lead to obstruction to the mass vaccination program in India.

11. CONCLUSION:

Willingness:

The study conducted shows that the vaccine hesitancy or willingness is not an issue in the country. About 90 % of participant are willing to get vaccinated and 70% have already taken the first dose. Out of which 59% were of 18-30 age group, 13% were of 31-44 age group and 28% were of 45 and above. It was found that most of the participant were vaccinated or were willing to get vaccinated. Among those who showed hesitancy it was either due to fear of side effect or due to fear of needle. And the willingness was found to be most in the 18-30 age group, female gender and of college level education.

Knowledge:

The lack of knowledge and perception towards vaccine is found to be low among the participants especially of 18-30 age group, female and of college level education. The knowledge was found to be only 31 % to 75 % among the participants. Only 52% knew that the vaccine is not legally mandatory. The lack of information and misinformation can prevent eligible individual to get vaccinated or even to follow proper protocol after vaccination. Most of the participant wasn't aware about the eligibility of vaccination for comorbid patients and COVID-19 recovered patients.

They also had presumption about the COVID-19 vaccine that it causes positivity in the PCR or antigen test. As the country continue to vaccinate people, there is a great need to educate people about the correct information of the vaccine so that the mass vaccination program would be successful. The findings in this study can be used to plan the vaccination campaigns.

Perception:

The study shows positive perception towards the COVID-19 vaccine. Most of the participants perceives that the COVID-19 vaccine is safe and effective with the ability to reduce the severity of the complication of the COVID-19 infection. This is helpful to the vaccination drive to create positive responses further among others.

12. SUGGESTION:

1. Based on the findings of the study, knowledge among the participants was found to be low that is between 31 % to 75 %. Only 31%- 34% knew about the vaccine eligibility criteria of chronic disease patient and vaccine negative result of PCR test. Measures should be taken to educate people to enhance their knowledge towards COVID-19 vaccine. Various mediums and programs should be undertaken for this.
2. To improve people's knowledge and understanding of the COVID-19 vaccine, it's critical to raise awareness and educate them.
3. It is observed participants have positive perception towards the COVID-19 vaccine so improvement measurement can be taken

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