



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



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INTRODUCTION

RATIONALE

RESEARCH QUESTION

RESEARCH OBJECTIVES

METHODOLOGY

DATA ANALYSIS

BACKGROUND CHARACTERISTIC

RESULT AND ANALYSIS

DISCUSSION

CONCLUSION

SUGGESTION

REFERENCES

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.

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- 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.

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

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

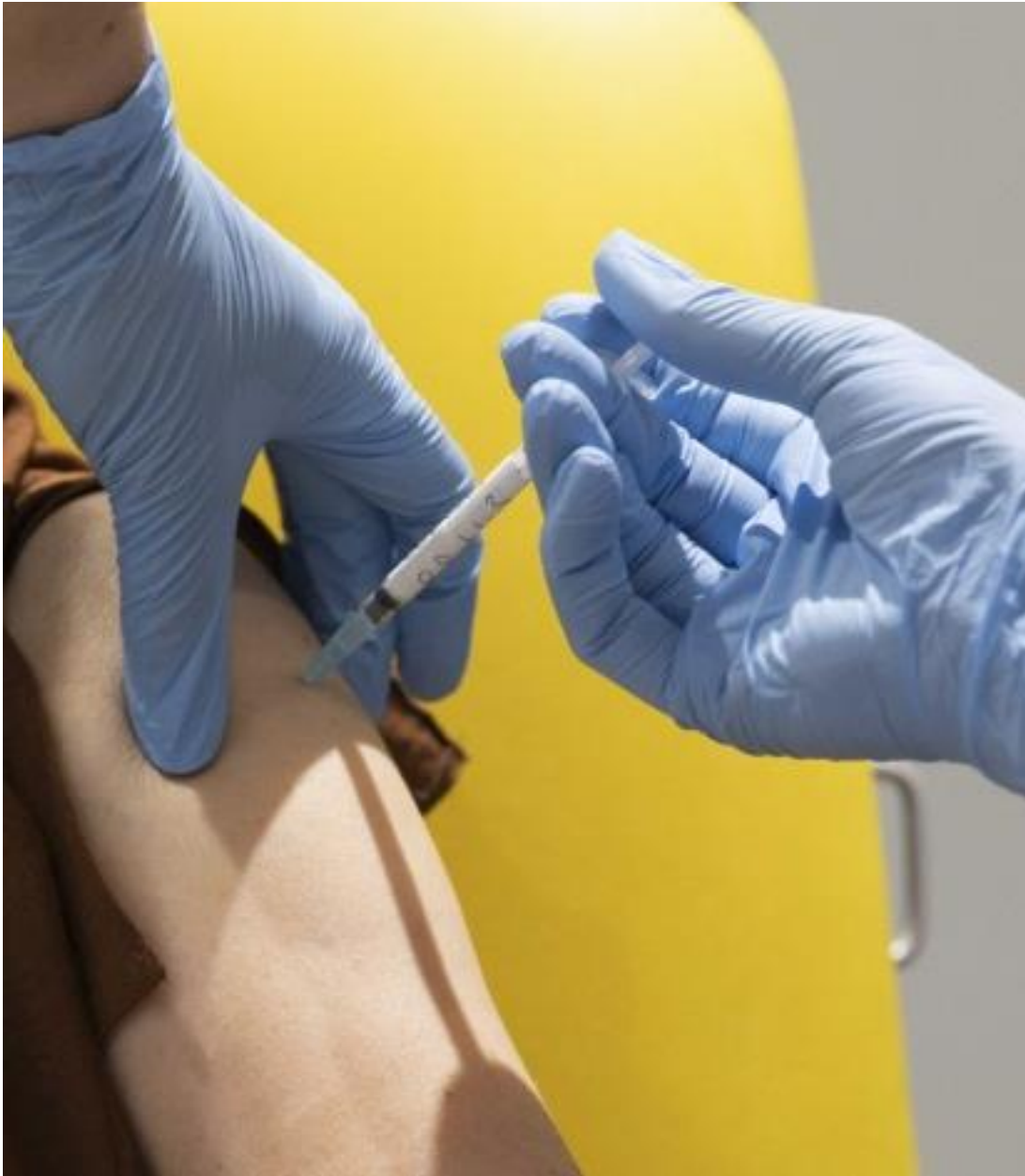


ELIGIBILITY CRITERIA FOR THE VACCINE:

- 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.

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



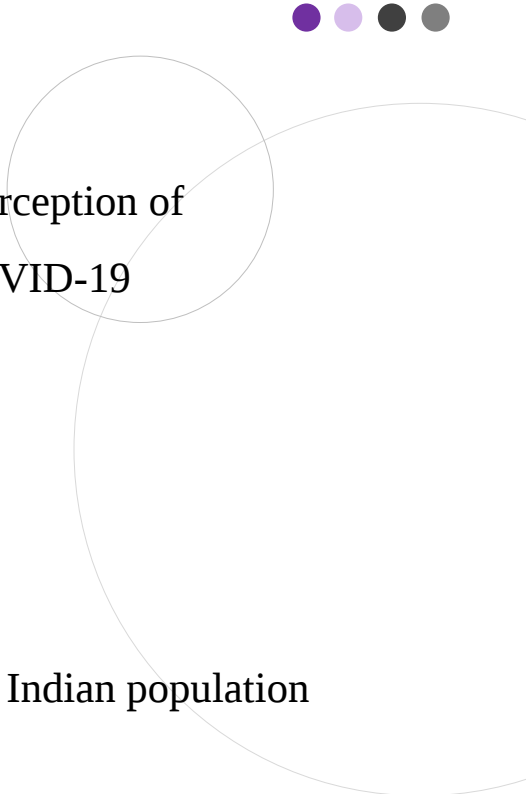
RATIONALE

- 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.
- 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.



RESEARCH QUESTIONS

RESEARCH OBJECTIVES



What is the willingness, knowledge and perception of Indian Urban adult population towards COVID-19 vaccine?



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



METHODOLOGY:

- 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. 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.



N= 323 (Sample Size)

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

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 is used to check the association of KAP characteristics with sociodemographic characteristics

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

● ● ● ● BACKGROUND CHARACTERISTICS OF THE PARTICIPANTS Continued

- Gender: 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: 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.

RESULT AND ANALYSIS:

KNOWLEDGE: Explored data to assess the knowledge of respondents regarding COVID-19 vaccine. Responses was measured on yes/no/maybe.

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





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.

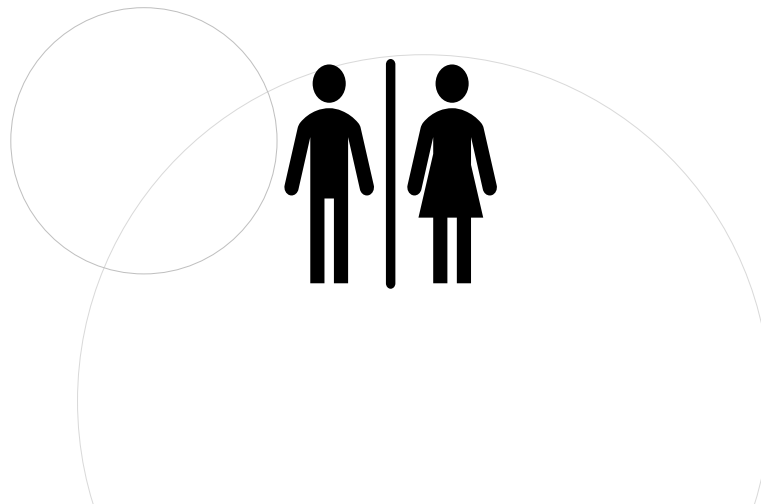




Table 1: Cross tabulation of age with questions related to knowledge towards COVID-19 vaccine

Questions	18- 30 age group	31- 44 age group	45 and above	Total Number	p value
1. Is the 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%)	
2. 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%)	
Grand Total	114	20	35	169	Grand Total

Questions	18- 30 age group	31- 44 age group	45 and above	Total Number	p value
3. 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%)	
4. 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%)	
5. 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



Table 2: Cross tabulation of gender with the questions related to knowledge towards COVID-19 vaccine

Questions	Female	Male	Total Number	p value
1. 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%)	
2. 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%)	
Grand Total	106	63	169	



Questions	Female	Male	Total Number	p value
3. 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%)	
4. 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%)	
5. 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	

● ● ● ● Table 3: Cross tabulation of education level with questions related to knowledge towards COVID-19 vaccine

Questions	College	High school	Secondary	Total Number	p value
1. 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%)	
2. 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%)	
Grand Total	158	8	3	169	

Questions	College	High school	Secondary	Total Number	p value
3. 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%)	
4. 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%)	
5. 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	



PERCEPTION ANALYSIS:

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

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 $p \text{ value} > 0.05$ 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.

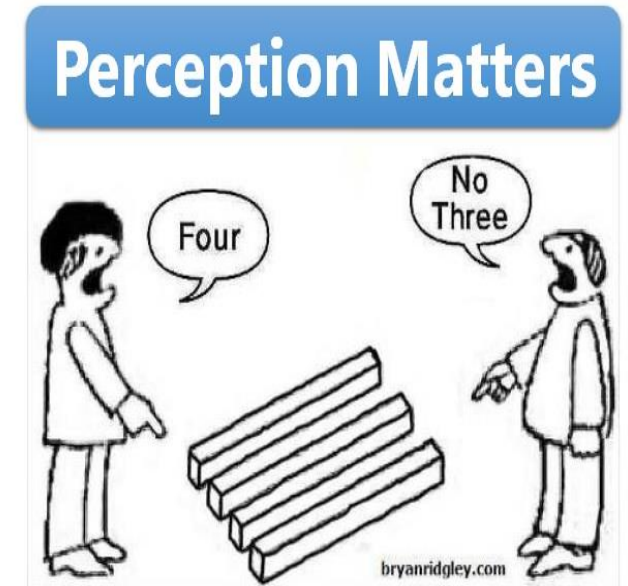




Table 4: Cross tabulation of age with the questions related to perception towards COVID-19 vaccine

Questions	18- 30 age group	31- 44 age group	45 and above	Total Number	p value
1. 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%)	
2. 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%)	
Grand Total	114	20	35	169	

Questions	18- 30 age group	31- 44 age group	45 and above	Total Number	p value
3. 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%)	
4. 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%)	
5. 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%)	
6. 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	



Table 5: Cross tabulation of gender with the question related to perception towards COVID-19 vaccine

Question	Female	Male	Total Number	p value
1. 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%)	
2. 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%)	
3. 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%)	
Grand Total	106	63	169	

Question	Female	Male	Total Number	p value
4. 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%)	
5. 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%)	
6. 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	

Table 6: Cross tabulation of education level with the question related to perception towards COVID-19 vaccine

Question	College	High school	Secondary	Total Number	p value
1. 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%)	
2. 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%)	
3. 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%)	
Grand Total	158	8	3	169	

4. 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%)	
5. 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%)	
6. 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	



WILLINGNESS:

Explored data to assess the willingness of respondents regarding COVID-19 vaccine. Some of the responses were measured on yes/no/maybe.

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.



Table 7: 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
1. 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%)	
2. 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	
3. 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	
4. 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	



Table 8: 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	



Table 9: 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	



BARRIER:

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.

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.

It is observed that barrier and suggestions are non-significant to age, gender and education level as the p value >0.05 .

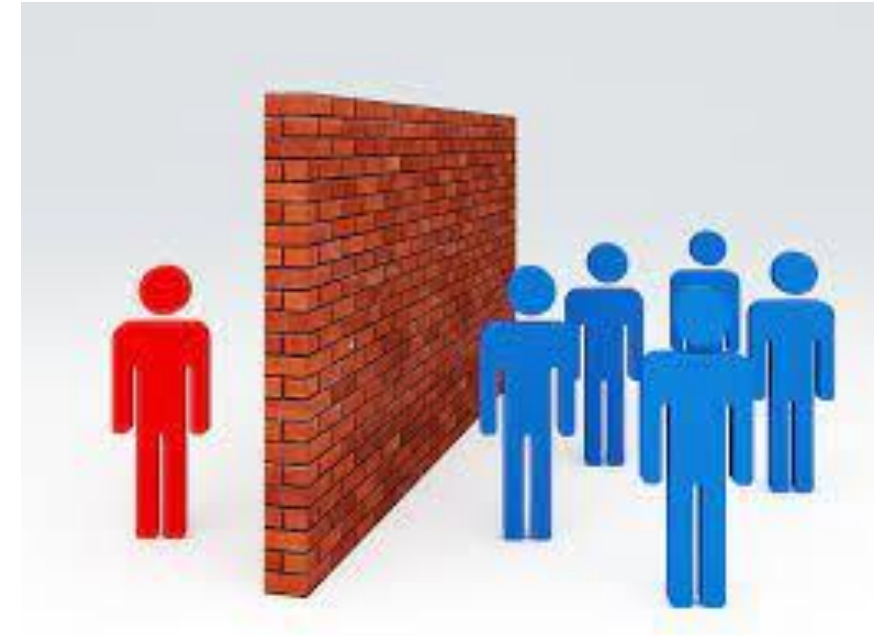




Table 10: Cross tabulation of age with questions related to barriers and options

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	



Table 11: 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	

● ● ● ● Table 12: 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	



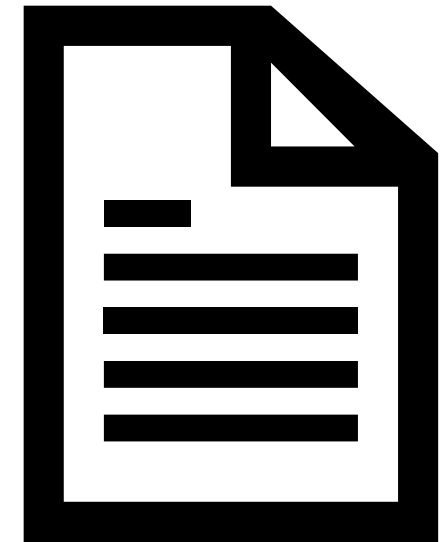
DISCUSSION

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

- **Knowledge:** 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 %. 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.
- **Perception:** 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.



- **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 acceptancy rate which is similar to this study





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. 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.

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.

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.



SUGGESTION:

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.

To improve people's knowledge and understanding of the COVID-19 vaccine, it's critical to raise awareness and educate them.



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THANK YOU