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Title: DETERMINANTS OF ACCEPTANCE OF COVID 19 VACCINE AMONG GENERAL POPULATION- A CROSS SECTIONAL STUDY IN HUBBALLI, KARNATAKA.

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ABSTRACT

Background: In December 2019 a new kind of Coronavirus called SARSCov-2(Severe Acute Respiratory Syndrome Coronavirus-2) emerged in Wuhan, China which causes mild to severe form of respiratory illness, which became a global pandemic. While specific medications are not yet available, development of different kinds of vaccine with promising results can be a key intervention against the on-going pandemic caused by SARS-CoV-2.

Aims and Objectives:

1. To identify the determinants of acceptance of Covid 19 vaccine.
2. To identify the facilitators regarding Covid 19 vaccine.

Methods: A predesigned online questionnaire was prepared in the form of Google forms and given to individuals at vaccination centre of KIMS Hubballi. If the participant was illiterate questionnaire was explained and data was collected by interviewer. The questionnaire comprised of general demographic data, existing comorbidities and various factors determining the acceptance of covid19 vaccine.

Results: The present study showed that 31% of the participants were in the age group 49-58. Majority of the people were graduates. Majority of the participants acquired information through newspaper and television. 50% of the participants

agreed that taking vaccine is citizen's responsibility. 40% of participants agreed that vaccine should be given free of cost.
Interpretation and Conclusion: The study findings show that covid19 vaccine acceptance is determined by multiple factors. Significant factors were recommendation by doctors, benefits of vaccine, protection provided by vaccine, it being a citizen's responsibility, Influencers.
Key words: Covid 19 Vaccine, Acceptance, Facilitators

Introduction

Coronavirus disease (COVID-19) is a fatal viral disease that continues to affect many countries around the world. SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) is a new coronavirus strain that has spread across the world and become a major public health concern.[1] The COVID-19 epidemic was declared a pandemic by the World Health Organization (WHO) on March 11, 2020.[2]

According to World health organisation reports there have been **196,553,009 confirmed cases** of COVID-19, including **4,200,412 deaths** in the world. In India from 3 January 2020 to 30 July 2021 there have been 31,572,344 confirmed cases with 423,217 deaths.[3]

The development of a COVID-19 vaccine to combat the disease's spread and devastating effects is still on-going, and as the pandemic progresses, new and more effective vaccines are likely to be developed. Vaccine delivery is continuing, and the public acceptance of the COVID-19 vaccine is critical.[4] Vaccination drive in India started on 16 January 2021in phased manner starting from Health care workers, frontline workers, senior citizens and now for all people above 15 years age. The success of vaccination program depends up on the turnover of the eligible candidates at the vaccination centres.

Understanding the influencing factors of the acceptance of COVID-19 vaccination and identifying common barriers and facilitators for vaccination decisions are important aspects in the design of effective strategies to improve the vaccine coverage rate among the general population. Therefore this study was carried out to study the determinants of acceptance of covid 19 vaccination and also to know the facilitators.

Objectives:

1. To identify the determinants of acceptance of Covid 19 vaccine.

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2. To identify the facilitators regarding Covid 19 vaccine.

Methodology:

It was a Cross sectional study which was conducted in vaccination sessions of Karnataka Institute of Medical Sciences and people who were attending vaccination session were included in the study.

Sample size: All participants who were attending vaccination session at Karnataka Institute of Medical Sciences Hubballi from 5/7/2021 to 14/7/2021 were included in the study. Convenience sampling technique was used for the study. Data was collected from 1002 participants during the period of data collection.

Methods of data collection and tools used: Data was collected using an online based Google form. If the participants were illiterate the questions were asked by the interviewer and Google form was filled by the interviewer. The questionnaire had two sections.

Section A: Information on socio-demographic details such as age, occupation, religion, place of residence, Educational status, any existing comorbid illness was collected.

Section B: Details about vaccination status, Source of information regarding vaccination, Vaccine preferences and other facilitators of acceptance of vaccination was collected. Validation procedure: The questionnaire was validated by sending it to the experts who are working in Vaccination related research and modifications were made according to the suggestions and final approval was taken. The questionnaire was pilot tested on 10 participants before finalizing.

Data analysis: The data collected was analysed using MS Excel and SPSS Version 16. Continuous data was expressed as mean and standard deviation. Categorical data was expressed as proportions. Chi-square test was used to known the association of various factors on the acceptance of Covid 19 vaccine. A p-value of <0.05 was considered as statistically significant.

ETHICAL CLEARANCE: Ethical clearance was obtained from Institutional Ethical Committee of Karnataka Institute of Medical Sciences, Hubballi before conducting the study.

RESULTS:

In the present study it was found that out of 1002 study participants 580(57.9%) were males and 422(42.1%) were females. The mean age of the study participants with standard deviation was 47± 17.89.

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Table 1 depicts the age distribution of study participants. In present study, 31% of the participants belonged to the age group 49-58 years among which 28.5% were females and 32.4% were males.

TABLE 2 – Demographic Profile of study participants (n=1002)

Demographic Variable	**n(%)**
Rural	221(22.1)
Urban	781(77.9)
RELIGION	
Christian	22(2.2)
Hindu	904(90.2)
Muslim	71(7.08)
Others	5(0.4)
EDUCATIONAL QUALIFICATION	
Illiterate	31(3.09)
Primary Education	100(9.98)
Secondary Education	345(34.43)
Graduate	424(42.3)
Post Graduate	102(10.17)

Table 2 depicts the sociodemographic features of study participants.

It was observed that 781(77.9%) of persons were from urban area, 904(90%) of persons were Hindu by religion and majority 424(42.3%) of participants were graduates.

Age group(in years)	**Female n (%)**	**Male n (%)**	**Total n (%)**
18-28	107 (25.4)	147 (25.3)	254 (25.4)
29-38	15 (3.6)	12 (2.1)	27 (2.7)
39-48	72 (17.1)	77 (13.3)	149 (14.9)
49-58	120 (28.5)	190 (32.8)	310 (31.0)
59-68	69 (16.4)	103 (17.8)	172 (17.16)
69-78	32 (7.6)	36 (6.2)	68 (6.78)
79-88	4 (1.0)	15 (2.6)	19 (1.89)
> 89	3 (0.5)	0 (0)	3 (0.2)
Total	422 (100)	580 (100)	1002 (100)

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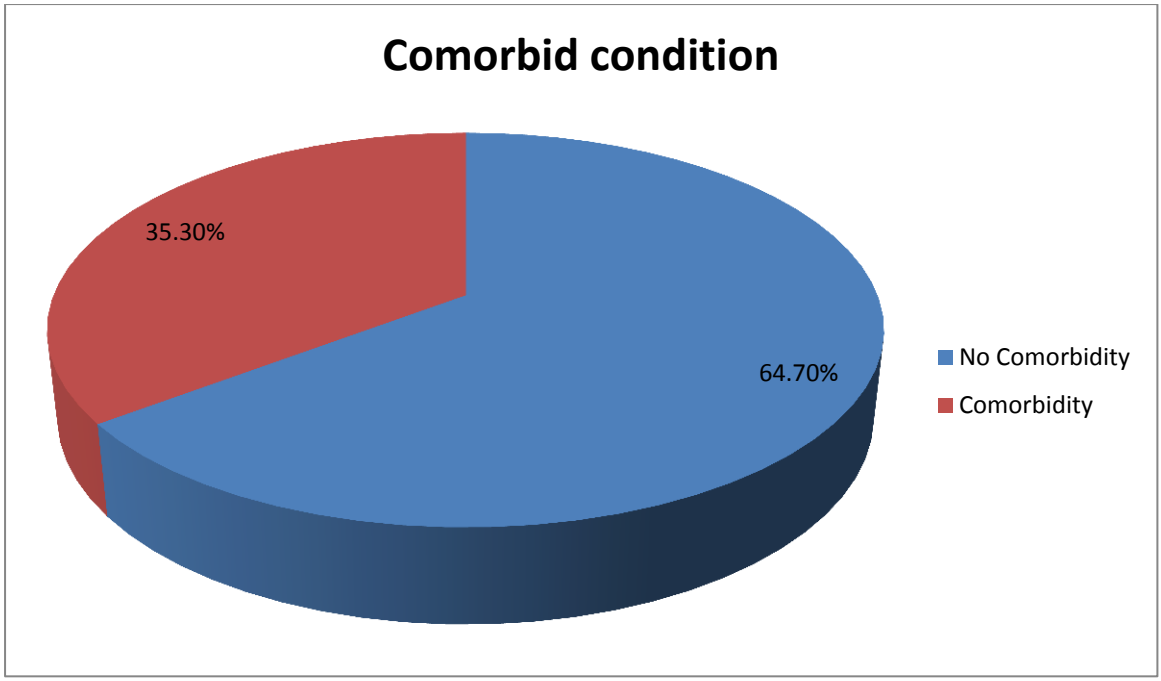

Figure 1 Distribution of Study participants according to Comorbidity

Figure 1 depicts that 649(64.7%) study participants did not have any comorbid condition and (35.3%) had associated comorbid condition.

TABLE 3 – Comorbidities among study participants (N=1002)

Comorbidity	**n(%)**
None	649(64.7)
Hypertension	107(10.67)
Diabetes	89(8.9)
Diabetes, Hypertension	70(6.98)
Joint disease	16(1.59)
Lung disease	15(1.5)
Cardiac disease	14(1.4)
Hypertension, Cardiac disease	13(1.3)
Diabetes, Cardiac disease	13(1.29)
Kidney diseases	11(1.09)
Hypertension, Lung disease	3(0.29)
Thyroid disorder	2(0.19)

Table 3 depicts that 353(35.3%) study participants had comorbid condition. Hypertension was seen in 107(10.6%) of the study participants and 8.9% of

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study participants had diabetes and 6% of participants had both diabetes and hypertension.

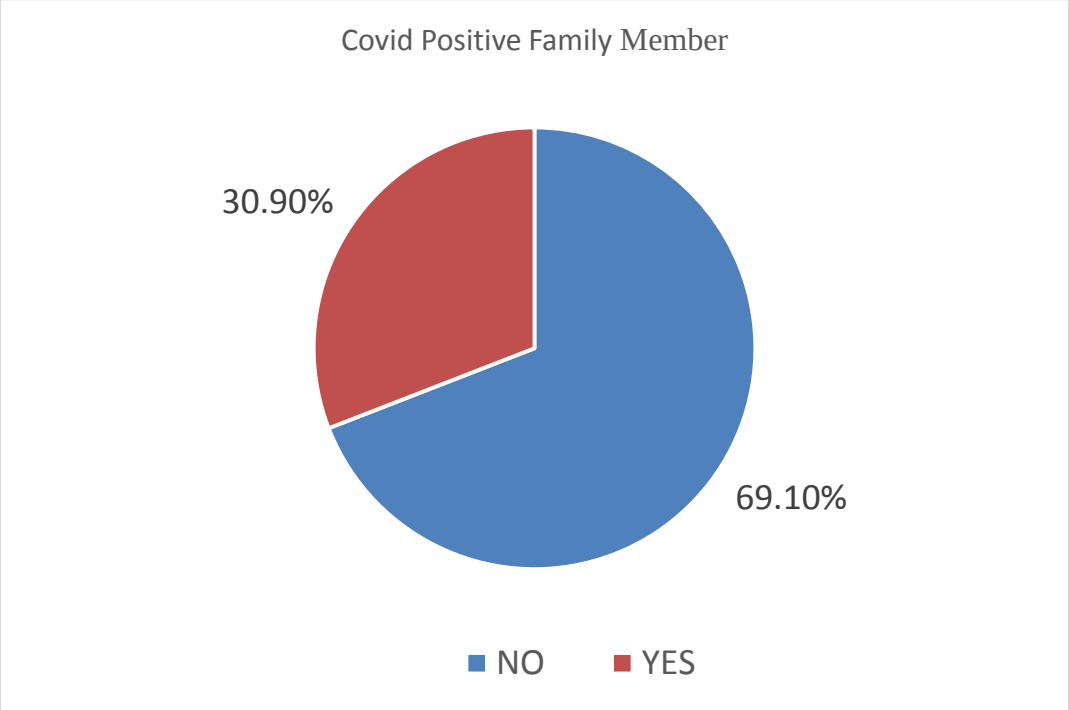

Figure 2 Presence of Covid Positive family member (atleast 1member)

Figure 2 depicts that 309 (30.9%) of study participants had at least one family member who was affected with Covid infection.

TABLE 4 – SOURCES OF INFORMATION ON COVID VACCINE

Sources Of Information	Number	Percentage
All	21	2.9%
Newspaper and Television	203	20.25%
Health care workers	196	19.5%
Newspaper and Social media	125	12.47%
Television Social media	97	9.68%
Newspaper, Television, Social media, Friends	71	7.08%
Television	59	5.88%
Newspaper	58	5.78%
Social media	57	5.6%

Social media, Health care workers	51	5.08%
Friends	37	3.6%
Radio	27	2.6%
Total	1002	100.0

This table depicts the different sources of information of study participants on Covid vaccine. It was observed that majority of the study participants 203(20.25%) acquired information on Covid vaccine through newspaper and television followed by 19.5% who got information from health care workers.

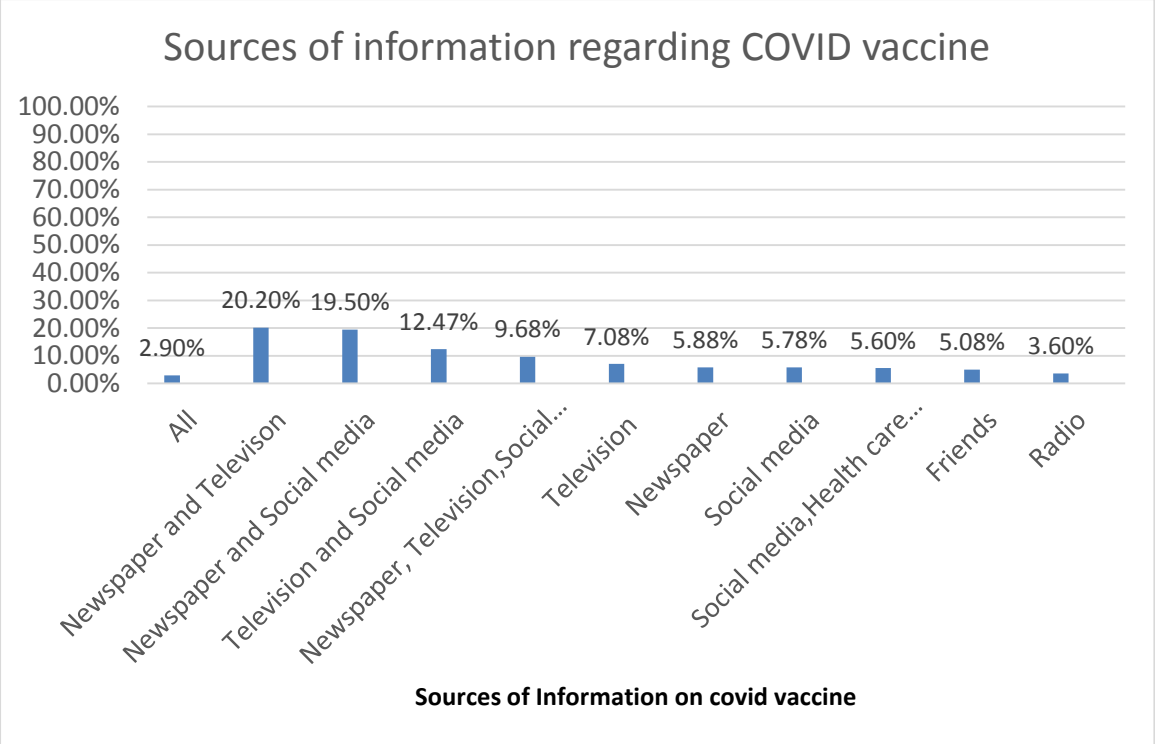

Figure 3 Sources of Information regarding Covid Vaccine for the study participants

Table 5 Knowledge of study participants regarding Covid Vaccine

Knowledge regarding Covid Vaccine	**Number**	**Percentage**
1.**Knows about availability of vaccine**		
No	146	14.5
Yes	856	85.2
2.Vaccine Preference		

Any	344	34.3
Imported	18	1.8
Indian Origin	640	63.8
3.Vaccine Should Be Given To		
All	827	82.5
Health Care Workers	44	4.39
Health Care Workers, Frontline Workers	43	4.2
Health Care Workers, Elderly	40	3.9
Health Care Workers, Frontline Workers	25	2.4
Frontline Workers and elderly	23	2.09

Table 5 depicts the knowledge of study participants. Among the study participants 856 (85.2%) study participants were aware of the availability of Covid vaccines. 640(63.8%) preferred Indian origin vaccines over imported vaccines. 827(82.5%) of study participants were of the opinion that Covid vaccine should be given to everyone.

	Facilitators driving the acceptance of Covid 19 vaccine	**Association with socio demographic correlates**			
		Age	Gender	Residence	Educational status
1)	No harm in taking the Covid-19 vaccine	p <0.05	p = n.s	p<0.05	P<0.05
2)	Protection against Covid-19 infection	p = n.s	p <0.05	p =n.s	p<0.05

3)	Availabilty of Covid-19 vaccine free of cost	p<0.05	p = n.s	p = n.s	p<0.05
4)	Recommendation from doctors	p<0.05	p =n.s	p<0.05	p<0.01
5)	More benefit of getting Covid-19 vaccine over its risks	p<0.05	p =n.s	p<0.05	p<0.05
6)	Taking Covid-19 vaccine is a citizen's responsibility	p<0.05	p =n.s	p<0.01	p<0.05

TABLE 6 – ASSOCIATION OF VARIOUS SOCIODEMOGRAPHIC FEATURES WITH THE FACILITATORS OF VACCINATION

n.s = not significant

This table depicts the association of various sociodemographic features with the facilitators of vaccination. For assessing facilitators of Covid vaccine Likert scale (Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree) was used.

558(55.7%) of the study participants agreed that there was no harm in taking the Covid vaccine and it was statistically significant in relation with age, residence and educational status. 598(59.7%) of the study participants agreed that vaccine provides protection against Covid 19 infection and it was statistically significant in relation with gender and educational status.

401(40%) of the study participants strongly agreed that the Covid vaccine should be given free of cost and it was statistically significant in relation with age and educational status.

562(56.1%) of the participants agreed that the vaccine should be taken on recommendation from a doctor and it was statistically significant in relation with age, residence, and educational status.

More than half 542(54.1%) of study participants agreed that there are more benefits from Covid vaccine over its risk and it was statistically significant in relation with the age, residence and educational status.

Half 521(52.1%) of the study participants agreed that taking Covid vaccine is a citizen’s responsibility

Majority of the study participants were influenced by others in taking the covid vaccine and it was statistically significant with age.

There was influence of role models/politicians/senior doctors for taking covid vaccine among 63.7% of study participants and it was statistically significant with the gender, residence and educational status.

DISCUSSION

Vaccination against Covid infection has formed one of the important weapons in our fight against Covid pandemic apart from Covid appropriate behaviour. Our present study was aimed at knowing the various determinants of acceptance of Covid vaccine and also to find out the facilitators regarding Covid vaccine.

In the present study 580(57.9%) were males and 422(42.1%) were females. The mean age of the study participants with standard deviation was 47(±17.89) and 76.6% study participants felt vaccine should be given free of cost. In a study done by A A Malik et al on Determinants of Covid 19 Vaccine acceptance in US 42% were males and 57% were females and demographic variations were identified in the study[5]. In another study Increased COVID-19 Vaccination Hesitancy and Health Awareness amid COVID-19 Vaccinations Programs in Israel done by Maayan Shacham et al 69.5% were Males and 30.4% Females with mean age of 39.04 (±15.59) in the general population and they showed increased health awareness.[6] In other study on Acceptance of Covid 19 vaccine in Southeast Asia by Harapan et al 466 (34.3) were males and 893 (65.7) were females and 93% of study participants were willing to take vaccine if it is given free of cost[7] which is in contrast to findings in our study where 76.6% study participants felt vaccine should be given free of cost.[7]

In the present study, majority of the participants belonged to the age group 49-58 years among which 28.5% were females and 32.4% were males. In another study on Acceptance of Covid 19 vaccine in Southeast Asia by Harapan et al majority 51.4% were in the age group of 21-30years.[7]

In the current study 77.9% of study participants were from urban areas, more than 3/4th of the study participants were Hindu by religion and majority were graduates. Similar kind of findings were found in a study done by Jiahao Wang et al on Acceptance of Covid 19 vaccination during the Covid pandemic in China where 50.2% were in the age group of 31-50years and 55.5% were graduates and 70% were from Urban areas and 89.5% of study participants felt that vaccination is an effective way to protect against Covid infection.[8] Similar findings were found in the present study where more than half of study participants felt that vaccination gives protection against Covid infection.

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In the present study 35.3% study participants had comorbid condition and similar kind of findings were found in the study Tamam El-Elimat on Acceptance and attitudes towards Covid 19 vaccine in Jordan 13.5% of the study participants were found to have comorbid condition.

In the index study, at least one family member of 31% of study participants was Covid positive. In a similar kind of study done by Tamam El-Elimat on Acceptance and attitudes towards Covid 19 vaccine in Jordan consisitent findings were observed where 36.5% of family members were affected with Covid infection.[9]

In the present study it was found that in most of the study participants 20.25% the major source of Information regarding Covid 19 vaccine was from newspaper and television. But in another study done by A. Kumari, P. Ranjan, S. Chopra et al it was found that 86.5% of study participants got information regarding Covid vaccine from health care providers. In another study done by Tamam El-Elimat on Acceptance and attitudes towards Covid 19 vaccine in Jordan contrast findings were found where 16.5% participants got vaccine related information from media.[9]

In the present study majority of the study participants 85% knew about the availability of Covid vaccine and 63.8% participants preferred Indian origin vaccine and majority felt that vaccines should be given to everyone. In a study done by Jiahao Wang et al it was found that 64% of the study participants preferred both domestic and imported vaccines.[8]

In the present study more than half (55.7%) of the study participants agreed that there was no harm in taking the Covid vaccine and is statistically significant in relation with age, residence and educational status. In another study done by A. Kumari, P. Ranjan, S. Chopra et al similar findings were found where 41% of the study participants agreed that there is no harm in taking Covid vaccine.[10]

59.7% of the study participants strongly agreed that vaccine provides protection against Covid 19 infection and is statistically significant in relation with gender and educational status and similar findings were found in the study done by A. Kumari, P. Ranjan, S. Chopra et al where 41% agreed that vaccine provides protection against Covid and it was statistically significant with age, gender and socioeconomic group.[10] In an another study done by M Md Akful Haque et al 67% of the study participants felt that vaccine provides protection against Covid infection.[12]

Majority (40%) of the study participants strongly agreed that the Covid vaccine should be given free of cost and it was statistically significant in relation with age and educational status. In a study done by A. Kumari, P. Ranjan, S. Chopra et al 36% agreed that vaccines should be given free of cost. [10] In another study done by Kaadan et al. on Determinants of Covid 19 Vaccine acceptance in the Arab world it was found that 62% participants would accept Covid vaccine if it is given free of cost.[11] In another study done by M Md Akful Haque et al it was found that 76% participants felt that they will take Covid vaccine on government recommendation.[12]

Majority(56.1%) of the participants agreed that the vaccine should be taken on recommendation from a doctor and is statistically significant in relation with age, residence, and educational status. In a study done by A. Kumari, P. Ranjan, S. Chopra et al 35% felt that vaccine should be taken on recommendation from a doctor.[10] similar kind of findings were found in a study done by Jiahao Wang et al on Acceptance of Covid 19 vaccination during the Covid pandemic in China where 80% study participants felt that Covid vaccine should be taken on recommendation from doctors.[8]

More than half (54.1%) of study participants agreed that there are more benefits from covid vaccine over its risk and is statistically significant in relation with the age, residence and educational status. In a study done by A. Kumari, P. Ranjan, S. Chopra et al 37% participants strongly agree that there are more benefits from covid vaccine over its risk and it was statistically significant with age, gender and socioeconomic group.[10]

Half (52.1%) of the study participants agreed that taking Covid vaccine is a citizen's responsibility. In a study done by A. Kumari, P. Ranjan, S. Chopra et al 42% participants strongly agreed that taking Covid vaccine is a societal responsibility.[10] There was influence of others among study participants in taking the Covid vaccine among 80% of study participants and it was statistically significant with age.

There was influence of role models/politicians/senior doctors for taking Covid vaccine in 63.5% study participants and is statistically significant with the gender, residence and educational status. In a study done by A. Kumari, P. Ranjan, S. Chopra et al it was seen that 36% participants were influenced by role models and political leaders.[10]

Limitations: There is a possibility of bias as under privileged populations may not have been able to participate in the survey. Study was time based one. Data collection was done for a limited period of time. Extension of data collection

could have led to more respondents. Most of the respondents are an urban population. The study is limited to a limited area. Therefore the findings cannot to generalised to the population.

Conclusion: This cross sectional study was an attempt to figure out the determinants of COVID 19 vaccine acceptance among people. Vaccines are now the only way out of the Pandemic. Knowledge and acceptance about vaccines play an important role in overcoming the Pandemic. Study shows knowledge about vaccines is good and is obtained mainly from Newspapers, Television and Social Media. Most of the respondents prefer vaccines of Indian origin. Study shows most of the population believes that taking vaccines will not cause them any harm. Most of them thought that vaccines should be given at free of cost. Political leaders and Celebrities influenced the decision of vaccine acceptance.

Recommendations: Our study shows a positive approach of the population towards vaccines and most of them believe that vaccines cause no harm. Social media and mass media also play an important role in giving information about vaccines. The key is to disseminate correct knowledge through reliable channels to instil confidence among people in getting vaccinated. Government officials should take steps to disseminate credible information about the vaccine development, its safety and efficacy, time needed for providing protection and the significance of herd immunity Our study also showed that political leaders and celebrities influenced vaccine taking decisions. Collaborations with local community leaders and/or celebrities can be done to influence general and local populations' decision on getting vaccinated. Pandemic has caused huge economical and developmental loss in the country. The country needs to get vaccinated as fast as possible to prevent further spread of Covid-19 viruses.

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Ethical Clearance: taken