



A Demographic Analysis of Attitude and Perception of Indians towards Acceptance of COVID-19 Vaccination

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ABSTRACT

COVID-19 is one of the biggest pandemic spread all over the world. It was a very severe issue because of the non-availability of vaccine to control or protect from it, due to which nations across the globe were facing too many problems to control the corona disease. Finally, vaccines were developed against this disease. The researchers have tried to explore the demographic information of the Delhi-NCR region of India and put an effort to examine the attitudes and perceptions of individuals towards COVID-19 vaccinations. After analysis, researchers found that the majority of the respondents are ready to take the vaccine and trust level on the vaccination is good in males and females i.e., 6 out of a scale of 10. Gender and age were found to be significant factors for the vaccination. Whereas, educational level and residential area were found to be non-significant factors for the vaccination.

Keywords: COVID-19, Corona virus, Pandemic, Vaccination, Attitudes, Perceptions

INTRODUCTION

COVID-19 is caused by a virus (SARS-CoV-2), which affects the respiratory system of the human body and it is believed that it was originated from the Wuhan City of China and it was taken the shape of a pandemic which is also declared by the WHO. This disease has crossed boundaries and spread in almost more than 200 countries across the world, affected in more than 15 million individuals and approx a million people passed away. The spread of this disease impacted the health of the people as well as having major impacts on the socio-economic conditions of so many nations.

There is certain specific thinking of individuals regarding vaccination among the common of the nation. It has been observed that acceptance of vaccines has varied demographically. Moreover, there are few other key factors such as the past record of the vaccination, lack of trust in the health care system and its services, age, gender, the educational and professional status of the individuals, etc also determines the acceptance level of vaccination. The safety and effectiveness of vaccines is considered as one of the major concern about the novel vaccines. So, due to the high mortality, some nations were started research and development of a vaccine.

By keeping given the above facts and figures, the Indian government has launched the COVID-19 vaccination and immunization in pan India on January, 16th, 2021. It was a day of celebration for all Indians and compliments to the scientists who were associated with the development of the vaccines, but still, some individuals were heeding to

rumors and conspiracy for a vaccine developed by India. By the end of 2021, there are approx more than 100 vaccines that have progressed to human clinical trials as well as other medicines will launch by various pharmaceutical companies. However, the availability of the COVID-19 vaccine doesn't mean that it will be necessarily connected to people for accepting it, despite some people doesn't show interest and willingness to vaccinate him may be due to inadequate health literacy and lower education level, which becomes the challenges for the vaccination drive in India. Vaccine hesitancy in the Indian public is one of the major health issues. People are having the false impression that there are some side-effects after the dose of the vaccination due to which people are hesitating for vaccination [1]. So, considering these factors, we aim to examine the attitudinal aspects behind the acceptance of vaccines and other demographic and health-related factors impacting COVID-19 vaccine acceptance. So, in this study authors also tried to attempt to explore the trust or confidence level of individuals towards domestically-made COVID-19 vaccines. In this study, we analyze the socio-demographic variables with the help of an online questionnaire which was distributed among the population of the NCR region in India.

MATERIALS AND METHODS

Before the COVID-19 pandemic, so many researchers have also done the study on other pandemics issues like bird flu, swine flu and pandemic (H1N1) 2009 and tried to explore the attitude and perception of the people towards the acceptance of vaccine, based on gender, age, ethnicity, etc. were doing their study on vaccination of influenza in 2008-2009, for H1N1 influenza and found that most of the people did not believe in this influenza vaccine because of their safety concerns and side effects of the vaccine, whereas half of the respondents have accepted the vaccine. Similarly, in the case of COVID-19 researchers have also tried to explore the acceptance level of people towards the COVID-19 vaccine of various countries. 21 from China have studied the demand for COVID vaccine during the COVID-19 pandemic in China and found that almost more than 90% of people were interested to take the COVID-19, while some groups of people said that they will delay the vaccination vaccine's safety concerns [2]. 22 were tried to explore the acceptance level of COVID-19 vaccination of two different phases and compared by doing the cross-section study between surveys of two different phases *i.e.*, during the severe epidemic phase (March-2020) and right before the approval of the COVID-19 vaccine in November-December 2020. These results found that more than 90% of people in March and approx 88% of people were interested to take the COVID-19 vaccination in China. The attitude and perception towards the acceptance of the COVID-19, vaccine was varied and the decision-making of respondents had impacted and found that people we're not ready to take vaccination due to its safety, side effects and price concerns.

One of the a cross-sectional studies was done in the USA by 18 on health care workers and found that 36% of respondents were agreed to take the vaccine, while 56% were not sure as well as only 8% of HCWs do not plan to get the vaccine as well as they also found that vaccine acceptance increased with increasing awareness level. In their study also found that people were more concerned regarding safety, effectiveness towards COVID-19 vaccination. 20 found that vaccine acceptance was not as high as well as several factors act towards the acceptance or refusal of the vaccine based on their socio-cultural, socio-demographic, economic, working status, age, gender and educational level. The main reasons for refusal of vaccine were: Safety concern, research and development and no. of trials and production process of vaccine. 6 were tried to examine the perception and attitude of people of Nigeria and found that most of the people are unaware about the disease, as well as they, are having negative perception about the COVID-19 vaccine due to which people were not agree and ready to take a vaccine [3]. He also found that socio-demographic factors had no significant impact on the perception and attitude of people to take in the COVID-19 vaccines.

The research is a cross-sectional study with the help of non-probability sampling techniques by using a self-constructed questionnaire. The study was conducted between 1st April to 15th May 2021. In the research questionnaire, researchers have consisted various questions like individuals' demographic background and their perception, attitude and trust level towards the acceptance of COVID-19 vaccine; an independent sample t-test is used to determine the difference in the trust level of males and females towards COVID-19 vaccinations. The *chi-square* test is applied to found out the relationship between gender, education level, residential area, age and acceptance of vaccination. A sample size of 500 have been taken for the study in which only 420 have responded out of which only 412 responses were considered in the study. The sample was collected from the Delhi-NCR region.

Objectives

- To examine the awareness and willingness to accept COVID-19 vaccination.
- To examine the difference in trust level of vaccination based on gender.
- To determine the relation between demographical factors and acceptance of vaccination.

Hypothesis

To fulfill the above objectives the following hypotheses are developed:

- H_{01} : The trust level for vaccination is the same for male and female.
- H_{02} : There is no significant difference between the gender and acceptance of the COVID-19 vaccine.
- H_{03} : There is no significant difference between the educational level and acceptance of the COVID-19 vaccine.
- H_{04} : There is no significant difference between the residential area and acceptance of the COVID-19 vaccine.
- H_{05} : There is no significant difference between the age and acceptance of the COVID-19 vaccine.

RESULTS AND DISCUSSION

Demographic characteristics

A total of 412 individuals has completely filled the distributed questionnaire during the period of two-month *i.e.*, (Feb 1-April 31). Amongst the participants (74.3%) were below 45 age group *i.e.*, 18-44 years while individuals of 45+ age group were constituted only 25.7% (Table 1).

In this data most of the individuals were male *i.e.*, 53.2% as well as 57.8% were service class while the other participants were students (23.1%), homemaker (9.0%) retired (1.9%), businessman (4.4%) and 3.8% self-employed. As per the educational qualification background (1.2%) of people are high school, (3.9%) are intermediate, (25.0%) are under-graduate and (69.9%) were having a postgraduate degree. The majority of the respondents were from the urban area of NCR region (75.0%), while the remaining participants originated from semi-urban (19.2%) and rural areas (5.8%). From the above, we can see that 66% of the respondents are registered or vaccinated and 53% are male and 47% are female.

Table 1 Respondents profile.

Variables		N	Marginal percentage
Registered for vaccine	Yes	272	66
	No	140	34
	Total	412	100
Gender	Male	219	53.2
	Female	193	46.8
	Total	412	100
Educational level	High school	5	1.2
	Intermediate	16	3.9
	Graduate	103	25
	Post graduate	288	69.9

		412	100
Occupation	Service	238	57.8
	Students	95	23.1
	Home maker	37	9
	Retired	8	1.9
	Business	18	4.4
	Self employed	16	3.8
	Total	412	100
Family income	Below 2.5 lakh	79	19.2
	Between 2.5 to 5.0 lakh	95	23.1
	Between 5 to 8 lakh	90	21.8
	Above 8 lakh	148	35.9
	Total	412	100
Residential area	Urban	309	75
	Semi-urban	79	19.2
	Rural	24	5.8
	Total	412	100
Age	Below 45 years	306	74.3
	45 years and above	106	25.7
	Total	412	100

Trust level of vaccine

The trust level of vaccine was measured through a 10-point Likert-type scale, where 1-no trust, 10-very high level of trust. The following is the outcome of the t-test.

From the Table 2 we can interpret that the mean score of male is higher as compare to the mean score of female [4]. It shows that the trust level of males is more in the vaccination as compare to the females.

Table 2 Group statistics-trust level of vaccine.

Trust level	Gender	N	Mean	Std. deviation	Std. error mean
	Male	219	6.58	2.803	0.189
	Female	193	6.45	2.157	0.155

From the Table 3 we can interpret that there is no significant difference in the trust level on the basis of gender though the mean value of males are more but that is not statistically significant. So the first null hypothesis is accepted.

Table 3 Independent samples test-trust level of vaccine.

		Levene's test for equality of variances		T-test for equality of means						
		F	Sig.	T	Df	Sig. (2tailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
									Lower	Upper
Trust level	Equal variances assumed	0.129	0.72	0.558	410	0.577	0.139	0.249	-0.351	0.628
	Equal variances not assumed	-	-	0.567	402.877	0.571	0.139	0.245	-0.343	0.62

Relationship between vaccination and gender

To determine the relationship between gender and vaccination *chi-square* test has been used. From the *chi-square* Table 4, we can interpret that there is a significant relationship between gender and vaccination as the significance level is 0.002. The study found male respondents are more inclined towards the vaccination as compared to female respondents.

Table 4 *Chi-square* test: Vaccine and gender.

Variables	Value	df	Asymp. sig. (2-sided)
Pearson <i>chi-square</i>	12.878	1	0.002
Likelihood ratio	12.84	1	0.001
Linear-by-linear association	12.757	1	0.001
N of valid cases	412	-	-

Relationship between vaccination and educational level

Chi-square test has been used to determine the relationship between educational level and vaccination. The study categorized educational level into post graduate, graduate, intermediate and high school.

From the *chi-square* Table 5, we can interpret that there is no significant relationship between educational level and vaccination as the significance level is 0.216. It shows that educational level nothing to do with the acceptance of vaccination [5].

Table 5 *Chi-square* test: Vaccine and educational level.

Variables	Value	df	Asymp. sig. (2-sided)
Pearson <i>chi-square</i>	4.453	3	0.216

Likelihood ratio	4.604	3	0.201
Linear-by-linear association	1.698	1	0.176
N of valid cases	412	-	-

Relationship between vaccination and residential area

Chi-square test has been used to determine the relationship between residential area and vaccination. The study categorized residential areas into urban, semi-urban and rural areas.

From the *chi-square* Table 6, we can interpret that there is no significant relationship between residential area and vaccination as the significance level is 0.598 [6]. It shows that urban, semi-urban or even rural area people are giving their acceptance for vaccination.

Table 6 *Chi-square* test: Vaccine and residential area.

Variables	Value	df	Asymp. Sig. (2-sided)
Pearson <i>chi-square</i>	0.924	2	0.598
Likelihood ratio	0.876	2	0.627
Linear-by-linear association	0.485	1	0.472
N of valid cases	412	-	-

Relationship between vaccination and age

A *chi-square* test has been used to determine the relationship between age and vaccination. The age group was categorized into two groups first one is between 18 years to 45 years and the second one 45 years or more.

From the *chi-square* Table 7, we can interpret that there is a significant relationship between age and vaccination as the significance level is 0.001 [7-9]. It shows that the respondents related to the age group of more than 45 have registered/vaccinated more as compare to the other age group.

Table 7 *Chi-square* test: Vaccine and age.

Variables	Value	df	Asymp. Sig. (2-sided)
Pearson <i>chi-square</i>	8.356	1	0.001
Likelihood ratio	8.791	1	0.001
Linear-by-linear association	8.248	1	0.001
N of valid cases	412	-	-

Vaccination for the COVID-19 has become the game-changer for the health sector and one of the major interventions of these decades [10-12]. Whereas with so many advantages of vaccination, it is also facing many issues. Some factors like demographic, socio-cultural and contextual human are the reasons for acceptance of vaccination among the individuals. It has observed that the negative attitude and perception of individuals towards the COVID-19 vaccines are the major hurdles for vaccination drive for governments [13-15].

CONCLUSION

In the current situation, there are very few studies have been found related to COVID-19 vaccine acceptance, although various studies have been done at the global level. Our results indicate that vaccine acceptance is 66% approx. in India. As per the data study conducted in the USA, it has been reported that more than 80% population are willing to take vaccination. As the other studies were done in China stated that 72.5% of the population are willing to take vaccination. As per this current report acceptance ratio in India is approx 66% in India which is higher as compared to studies of some other nations like Russia 54%, Poland 56%, Hungary 56% and South Africa 64%. Based on the study we can say that the trust level on the vaccination is good in males and females it is above 6 out of a scale of 10. Gender and age were found to be significant factors for the registering/vaccination. On the other hand, educational level and residential area were found to be non-significant factors for the registering/vaccination.

LIMITATIONS

This study has several limitations. Firstly, we had taken the sample of only the Delhi-NCR region in India. Secondly, the time duration is only two months, as well as the current study, was conducted with the help of an online questionnaire. As a result mode of the survey, the limited area may be considered as limitations for this study.

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