A Study to Assess the Knowledge of COVID-19 and Acceptance of COVID-19 Vaccine among Adults

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ABSTRACT

Objective: The objective of this study to assess the knowledge of COVID-19 and acceptance of COVID-19 vaccine among adults in Delhi NCR.

Methodology: A cross sectional descriptive study was conducted to assess the knowledge and the acceptance of COVID-19 vaccine among adults in Delhi NCR using a validated, self-administered electronic questionnaire that was distributed through emails (Gmail) and online social networking platforms such as WhatsApp, LinkedIn, Telegram. The participants of the study were informed about the objective of the study through the questionnaire itself and their participation in the study was considered as the consent.

Result: 88.2% of participants were willing to take the vaccination despite their uncertainty about its success only 5.2% were not willing to take the vaccination and 6.6% were not sure whether they should or not take the vaccination. Although the acceptance of vaccination is high moreover, transparent communication about vaccine effectiveness and safety will contribute to increasing public trust in COVID-19 vaccination programs.

Keywords: COVID-19, acceptance of COVID-19 vaccine, COVID-19 vaccination programs, Delhi NCR

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease [1]. Before that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province in February 26th [2] [3] [4]. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV [5]. Later, the virus genome was sequenced [6] and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses [7][8].

Coronaviruses vary significantly in risk factor. Some can kill more than 30% of those infected, such as MERS-CoV, and some are relatively harmless, such as the common cold. Coronaviruses can cause colds with major symptoms, such as fever, and a sore throat from swollen adenoids. Coronaviruses can cause pneumonia (either direct viral pneumonia or secondary bacterial pneumonia) and bronchitis (either direct viral bronchitis or secondary bacterial bronchitis). The human coronavirus

discovered in 2003, SARS-CoV, which causes severe acute respiratory syndrome (SARS), has a unique pathogenesis because it causes both upper and lower respiratory tract infections.[9]

Six species of human coronaviruses are known, with one species subdivided into two different strains, making seven strains of human coronaviruses altogether. Seasonal distribution of HCoV-NL63 in Germany shows a preferential detection from November to March

Four human coronaviruses produce symptoms that are generally mild, even though it is contended they might have been more aggressive in the past:

1; Human coronavirus OC43 (HCoV-OC43), β-CoV

2; Human coronavirus HKU1 (HCoV-HKU1), β-CoV

3; Human coronavirus 229E (HCoV-229E), α-CoV

4; Human coronavirus NL63 (HCoV-NL63), α-CoV

Three human coronaviruses produce potentially severe symptoms:

1. Severe acute respiratory syndrome coronavirus (SARS-CoV), β-CoV (identified in 2003)
2. Middle East respiratory syndrome-related coronavirus (MERS-CoV), β-CoV (identified in 2012)
3. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), β-CoV (identified in 2019)

These cause the diseases commonly called SARS, MERS, and COVID-19 respectively [9].

From last one year world is suffering from COVID-19 pandemic and according to current data 16.2 Cr people have tested positive for COVID-19 worldwide out of which 33.6 L people have been reported dead due to the COVID-19. In India the count of total covid-19 cases is 2.44 Cr and the death count is 2.66 L while the recovery rate is 2.04 Cr till 15th May 2021. [10]

There are test available for COVID-19 that can test for current infection or past infection.

1. A viral test tells you if you have a current infection. Two types of viral tests can be used: nucleic acid amplification tests (NAATs) and antigen tests.
2. An antibody test (also known as a serology test) might tell you if you had a past infection. Antibody tests should not be used to diagnose a current infection [11].

As the world is in the midst of a COVID-19 pandemic WHO and partners work together on the response tracking the pandemic, advising on critical interventions, distributing vital medical supplies to those in need and are currently working towards the safe and effective administration of vaccines.

According to WHO EUL/PQ evaluation process of COVID-19 vaccine, currently there are 19 vaccines available for COVID-19 each one of them are at different level of selection process.[12]

According to our world data 141 Cr people have been vaccinated worldwide out of which the number of people who have been fully vaccinated is 34.6 Cr [13].

In India, India's drug regulator has already given the green light to Covishield (the local name for the Oxford-AstraZeneca vaccine developed in the UK) and Covaxin, locally-made by pharma company Bharat Biotech. Vaccine is currently being administrated in two doses with the gap of 28 days in between. According to Ministry of Health and Family Welfare (MOHFW) currently the count of Total Vaccination is: 18Cr out of which the number of people who have been fully vaccinated is 3.98 Cr till 15th May 2021 and it's increasing every day [14].

Based on the potential availability of vaccines the Government of India has selected the priority groups who will be vaccinated on priority as they are at higher risk. The first group includes healthcare and frontline workers. The second group to receive COVID-19 vaccine was the persons over 60 years of age and persons between 45 and 59 years of age with comorbid

conditions. From April 1st, 2021, People above the age of 45 years (born before 1st Jan, 1977) are eligible to get the COVID-19 vaccine. From May 1, 2021, all eligible citizens above the age of 18 years can get the COVID-19 vaccine [15].

People who are currently not eligible for covid-19 vaccine due to the risk of possible Adverse Events Following Immunization (AEFI) are children below the age of 18 years, pregnant and lactating women and people who are and recently been Corona positive.

With the approval and distribution of these vaccines comes many misconceptions, vaccine hesitancy related to vaccine effectiveness and side-effects. So, with the help of this study, we want to know about the views of adults on Covid-19 vaccine and its acceptance.

Motivation and Need for study:
World is currently facing a worldwide pandemic and the only way it can finally end is by complete immunization. Although vaccination of COVID-19 is available currently, there might be people who will not be willing to take it because of some reasons including some misconceptions, hesitancy due to the fear of possible side effects, unavailability of vaccines etc.

1. By this study the researcher wants to assess the knowledge of COVID-19 in adults.
2. Researcher also want to find out the views of adults on the acceptance of COVID-19 vaccine.
3. As a result of this study, researcher want to find out what people think about COVID-19 and its vaccination and are they willing to take the vaccination if no what are the reasons behind it.

Aim and objectives
Aim: To know about the knowledge of COVID-19 and the acceptance of COVID-19 vaccine among adults.

Objectives:
- To assess the knowledge on COVID-19 in adults.
- To find out the correlation between education, knowledge and misconceptions related to COVID-19 vaccine.
- To assess the acceptance of COVID-19 vaccine among adults.
- To find out the reasons of non-acceptance of COVID-19 vaccine

REVIEW OF LITERATURE
Although there are many studies available regarding the perception of knowledge about COVID-19 and acceptance of COVID-19 vaccine before its arrival but we couldn't find studies related to the knowledge assessment of COVID-19 and its vaccine acceptance after the release of vaccine.

- The coronavirus disease 2019 (COVID-19) pandemic has spread across the world with millions infected and hundreds of thousands of dead. While most countries impacted have developed successful response strategies and observed significant improvements, the U.S. (as of June 28th, 2020) leads globally with 2¢50 million cases and over 125,000 deaths. Additionally, according to the Centres for Disease Control and Prevention (CDC), current data show a disproportionate burden of COVID-19 infections and deaths among racial and ethnic minority communities. With the U.S. facing an economic disruption and the future remaining unknown, a vaccine to prevent COVID-19 infection is perhaps the best hope for ending the pandemic. As misinformation about COVID-19 has spread across media outlets, it is important for U.S. public health officials and politicians to begin planning for effective messaging and policies before a vaccine is introduced. The U.S. already struggles with reaching high rates of influenza vaccine coverage - with less than half of the adult population vaccinated in 2019-

therefore, COVID-19 presents an imminent danger that requires immediate action. Health communication must reach all communities, especially the most vulnerable, to educate Americans about the safety of vaccines and prevent future infections and deaths. Therefore, a survey was conducted using an online platform on U.S. adult population in May 2020 to understand risk and perceptions about the COVID-19 pandemic, acceptance of COVID-19 vaccine, and trust in sources of information. These factors were compared across basic demographics. Of the 672 participants surveyed, 450 (67%) said they would accept a COVID-19 vaccine if it is recommended for them. Although their study found a 67% acceptance of a COVID-19 vaccine, there were noticeable demographic and geographical disparities in vaccine acceptance.[16]

- Since its emergence in December 2019, the coronavirus disease 2019 (COVID-19) has spread worldwide and became a pandemic of international concern. COVID-19 has induced an unprecedented global burden on health and economy. As of 29 November 2020, it has led to greater than 1.4 million deaths in 220 countries or territories. While it appears that the whole world is looking forward to the arrival of a safe and effective vaccine, the acceptance for COVID-19 vaccine by general public remains uncertain. That is why A cross-sectional, web-based anonymous survey was conducted using an online questionnaire from 3 to 12 April 2020. Under this survey the Health Belief Model (HBM) was used to assess predictors of the intent to receive the vaccine and the willingness to pay (WTP). The researchers used the social network platforms to disseminate and advertise the survey link to the public. A total of 1,159 complete responses were received. The majority reported a definite intent to receive the vaccine (48.2%), followed by a probable intent (29.8%) and a possible intent (16.3%). Under the perceived benefits construct in the HBM, believe that the vaccination decreases the chance of infection and the vaccination makes them feel less worry. The objectives of this study were to evaluate the acceptance of COVID-19 vaccine in the general population of Hong Kong, and examined the factors independently associated with willingness. In particular, we hypothesised that the HBM constructs and level of trust towards the healthcare system and/or vaccine manufacturers are significantly associated with the acceptance of an individual to COVID-19 vaccine. [17]

- Understanding the perception and concerns of people about COVID-19 vaccine in developing and populous country like India will help in understanding demand for the vaccine and further tailoring out public health information and education activities before the launch of the vaccine. The study was carried out to assess the present state of knowledge people have about the probable vaccine for COVID-19, to know the preferences of respondents about this vaccine and to learn the expectations and apprehensions of people about features of this prospective COVID-19 vaccine residing in the capital city of India. A cross-sectional study was conducted amongst the residents of Delhi, India from July-October 2020. Both offline and online interview method was used to collect data from 513 participants representing various occupational strata. Data was collected on socio demographic variable, vaccine acceptance and concerns regarding COVID-19 vaccine. Among the study population 79.5% said they will take the vaccine while 8.8% said they were not going to take the vaccine and remaining 11.7% had not yet decided about it. Most of them

(78.8%) believed that vaccine would be available to public next year but at the same time half (50.1%) of them believe that it may not be in sufficient amount for everyone to get. More than 50% were willing to pay for the vaccine and 72% felt vaccine should first be given to health workers and high-risk group. The following study has helped to understand the percentage of people who are hesitant to take the vaccine and also the concerns regarding the vaccine. Also, since half of the population is willing to pay for the vaccine, a strategical approach considering the various economical classes of people could be applied in a developing country like India.[18]

- An article was published on the COVID-19 vaccines rush: participatory community engagement matters more than ever under this article researchers discussed about the various announcement of effective and safe vaccines for COVID-19. While COVID-19 vaccines bring potential hope for a return to some kind of normality, vaccine-based protection is contingent on sufficient population coverage and requires effective governance, organisational, and logistical measures within a wider COVID-19 control strategy that includes continued surveillance and appropriate countermeasures. In this new phase of the COVID-19 response, successful vaccine roll-out will only be achieved by ensuring effective community engagement, building local vaccine acceptability and confidence, and overcoming cultural, socioeconomic, and political barriers that lead to mistrust and hinder uptake of vaccines.[19]

- The COVID-19 pandemic is expected to continue to impose enormous burdens of morbidity and mortality while severely disrupting societies and economies worldwide. Governments must be ready to ensure large-scale, equitable access and distribution of a COVID-19 vaccine if and when a safe and effective one becomes available. This will require sufficient health system capacity, as well as strategies to enhance trust in and acceptance of the vaccine and those who deliver it. To know about the concerns and views of population towards COVID-19 vaccine. A study was conducted of potential acceptance of a COVID-19 vaccine in 13,426 randomly selected individuals across 19 countries, most with a high COVID-19 burden. Of these, 71.5% responded that they would take a vaccine if it were proven safe and effective, and 48.1% said that they would get vaccinated if their employer recommended it. However, we observed high heterogeneity in responses between countries. Furthermore, reporting one's willingness to get vaccinated might not be necessarily a good predictor of acceptance, as vaccine decisions are multifactorial and can change over time.[20]

- The development and widespread use of an effective SARS-CoV-2 vaccine could prevent substantial morbidity and mortality associated with COVID-19 and mitigate the secondary effects associated with non-pharmaceutical interventions. An age-structured, expanded SEIR model with social contact matrices was used to assess age-specific vaccine allocation strategies in India. We used state-specific age structures and disease transmission coefficients estimated from confirmed incident cases of COVID-19 between 1 July and 31 August 2020. Simulations were used to investigate the relative reduction in mortality and morbidity of vaccine allocation strategies based on prioritizing different age groups, and the interactions of these strategies with concurrent non-pharmaceutical interventions. Given the uncertainty associated with COVID-19 vaccine development, we varied vaccine characteristics in the modelling

simulations. Daily and state-specific confirmed incident SARS-CoV-2 infection case data were collected from multiple sources, including the Ministry of Health and Family Welfare, the Indian Council of Medical Research, and a website for crowd-sourced information related to COVID-19 (www.covid19india.com). The data available from this website are collated from public sources and validated by a group of volunteers. As a result of this study the findings support international recommendations to prioritize COVID-19 vaccine allocation for older adults (World Health Organization, 2020b), as it contributed to the greatest relative reduction in overall mortality in all scenarios considered. Our analyses indicate that prioritising younger populations will have a greater impact on reducing incidence of infections relative to prioritizing older age groups. However, these reductions are marginal and prioritizing younger age groups will contribute the lowest relative reduction on COVID-19 mortality compared to other strategies, including equal distribution to the general population [21].

- Vaccine hesitancy remains a barrier to full population inoculation against highly infectious diseases. Coincident with the rapid developments of COVID-19 vaccines globally, concerns about the safety of such a vaccine could contribute to vaccine hesitancy. The anonymous web-based survey followed the American Association for Public Opinion Research (AAPOR) reporting guideline. Confidentiality of information was assured. Participants were permitted to terminate participation at any time. The survey was conducted by regions and stratified for health care personnel at academic medical centres across Israel, or members of the general population. Questionnaires were distributed electronically via Qualtrics over a 2-week period, 1 week after initiation of

social distancing and quarantine regulations in Israel (March 19, 2020). 1941 anonymous questionnaires were analysed which were completed by healthcare workers and members of the general Israeli population, regarding acceptance of a potential COVID-19 vaccine. The results indicate that healthcare staff involved in the care of COVID-19 positive patients, and individuals considering themselves at risk of disease, were more likely to self-report acquiescence to COVID-19 vaccination if and when available. In contrast, parents, nurses, and medical workers not caring for SARS-CoV-2 positive patients expressed higher levels of vaccine hesitancy. Interventional educational campaigns targeted towards populations at risk of vaccine hesitancy are therefore urgently needed to combat misinformation and avoid low inoculation rates [22].

- The cross-sectional study was conducted using a validated, self-administered electronic questionnaire that was distributed through emails (Gmail and Rediff mail) and online social networking platforms such as WhatsApp, LinkedIn, Telegram, ResearchGate, and Facebook during the month of October 2020. The participants of the study were informed about the objective of the study. Among the 351 participants, 55% believed that the COVID-19 vaccination will be safe while only 46.2% believed that it will be effective. Majority of the participants (86.3%) were planning to get COVID-19 vaccination, whereas 13.7% admitted hesitancy. However, only 65.8% of the participants responded that they will receive vaccination as soon as possible whenever the vaccine is available. The study also identified that the concerns regarding the vaccine side effects acted as the key barrier for vaccine acceptance. The major findings of this study can be utilized in planning vaccination campaigns. Furthermore, the

level of vaccine acceptance can be increased within the population if additional studies can confirm the safety and effectiveness of available vaccine candidates [23].

- A web-based, cross-sectional study was conducted using snowball sampling strategy under a highly restricted environment. A bilingual, self-administered anonymous questionnaire was designed and sent to the study participants through social media plat-forms and email. Study participants were recruited across the country, including the four major cities (Riyadh, Dammam, Jeddah, and Abha) in Saudi Arabia. Key determinants that predict vaccine acceptance among respondents were modelled using logistic regression analysis. Of the 1000 survey invitees, 992 responded to the survey. Of the 992 respondents, 642 showed interest to accept the COVID-19 vaccine if it is available. Willingness to accept the future COVID-19 vaccine is relatively high among older age groups, being married participants with education level postgraduate degree or higher (68.8%), non-Saudi (69.1%), employed in government sector (68.9%). In multivariate model, respondents who were above 45 years and married were significantly associated with vaccine acceptance [24].

- An article was published on Covid-19 vaccine- promoting vaccine acceptance under this article researchers discussed that while many questions remain about COVID-19 vaccine, there has been great progress since mid-October 2020, when Annals of Internal Medicine and the American College of Physicians (ACP) hosted our first forum about COVID-19 vaccine. As we hosted our second forum on 16 December 2020, Americans and others around the globe were beginning to be vaccinated to protect them from COVID-19. Now comes the hard work of making sure sufficient numbers of people are vaccinated to end this

pandemic. The vaccine does no good if it remains in freezers and vials, we need to get the vaccine into people. In summary, clinicians and public health professionals need to anticipate, validate, and be prepared to address people's questions and concerns [25].

- A cross-sectional online survey was conducted between March 25 and April 6, 2020. Participants were asked if they would accept a free vaccine which was 95 or 50% effective. Using a logistic regression model, the associations was assessed between sociodemographic characteristics, exposure to COVID-19 information, or perceived risk of infection with acceptance of a hypothetical COVID-19 vaccine. As a result, among 1,359 respondents, 93.3% of respondents (1,268/1,359) would like to be vaccinated for a 95% effective vaccine, but this acceptance decreased to 67.0% (911/1,359) for a vaccine with 50% effectiveness. For a 95% effective vaccine, being a healthcare worker and having a higher perceived risk of COVID-19 infection were associated with higher acceptance [26].

- The COVID-19 vaccine was launched in India on 16th January 2021 for healthcare and frontline workers in Phase 1. The healthcare and frontline workers were initially not found to be very accepting of the vaccine and were hesitant to receive the vaccine due to several reasons. Currently, the phase-2 vaccination drive includes senior citizens over 60 years of age and persons between 45 and 59 years with comorbid conditions. The success of any immunization drive depends on its coverage and acceptance rate but there might be various concerns among people regarding the vaccine. In order to have a wide coverage of the population by vaccination and shun hesitancy towards the vaccine, it is critical to comprehend peoples' views regarding the vaccine. Therefore, a study aiming to interpret current knowledge, attitude,

perceptions and concerns regarding COVID-19 vaccine in the Indian population was conducted using focus group discussions. Under this study eight focus group discussions were conducted. Participants were recruited via purposive sampling. Discussions were recorded and transcribed verbatim. Key themes were extracted using thematic analysis method. As a result of this study there were 19 males and 24 females, with a mean age of 36 ± 11 years. Sub-themes identified were knowledge, attitude, perception and concerns regarding COVID 19 vaccine, leading to the main theme, i.e., views about the COVID-19 vaccine. People have mixed perceptions regarding COVID-19 vaccine. Channelling correct messages may improve people's willingness to get vaccinated [27].

- A cross-sectional survey was conducted among a representative sample of 2000 adults aged 18–64 years in France. The survey was fielded around 3 weeks after the first lockdown was lifted on June 2, 2020. Participants were selected from an online survey research panel, which was developed and is maintained by the opinion survey research firm BVA

(Paris, France) and consists of more than 700 000 French adults. Survey responses were collected from 1942 working-age adults, of whom 560 (28·8%) opted for no vaccination (outright vaccine refusal) and 1382 (71·2%) did not. In our model, outright vaccine refusal and vaccine hesitancy were both significantly associated with female gender, age, lower educational level, poor compliance with recommended vaccinations in the past, and no report of specified chronic conditions or no chronic conditions other than hypertension. Outright vaccine refusal was also associated with a lower perceived severity of COVID-19, whereas vaccine hesitancy was lower when herd immunity benefits were communicated and in working versus non-working individuals, and those with experience of COVID-19 (had symptoms or knew someone with COVID-19). For a mass vaccination campaign involving mass vaccination centres and communication of herd immunity benefits, our model predicted outright vaccine refusal in 29·4% of the French working-age population [28].

Table-1 OVERVIEW OF THE ABOVE REVIEWED RESOURCES

Authors	country	purpose	Type of source	Summary points
Amyn A. Malik	U.S.	To check the determinants of COVID-19 vaccine acceptance in the US	Research paper, E-clinical medicine journal	The COVID-19 pandemic continues to adversely affect the U.S., which leads globally in total cases and deaths. Online survey was done on US adult population to check the acceptance of covid-19 vaccine before its arrival
Martin C.S. Wong	Hong Kong	To check the Acceptance of the COVID-19 vaccine based on the health belief model	Research paper, vaccine journal	examined factors associated with acceptance of vaccine based on the constructs of the Health Belief Model (HBM). A population-based, random telephone survey was performed during the peak of the third wave of COVID-19 outbreak on adults.
Farzana Islam	New Delhi, India	To check Assessment of the knowledge, preferences and concern regarding the prospective COVID- 19 vaccine	Research paper	Understanding the perception and concerns of people about COVID-19 vaccine in developing and populous country like India will help in understanding demand for the vaccine. cross-sectional study was conducted amongst the residents of Delhi, India.
Rochelle Ann Burgess	UK	The COVID-19 vaccines rush: participatory community engagement matters more than ever	Research article	various announcement of effective and safe vaccines for COVID-19. While COVID-19 vaccines bring potential hope for a return to some kind of normality, vaccine-based protection is contingent on sufficient population coverage and requires effective governance, organisational, and logistical measures within a wider COVID-19 control strategy that includes continued surveillance and appropriate countermeasures.
Christine Laine	US	COVID-19 Vaccine: Promoting Vaccine Acceptance	Research article	promoting vaccine acceptance under this article researchers discussed that while many questions remain about COVID-19 vaccine, there has been great progress since mid-October 2020

Table no 1: continued…				
Michaël Schwarzinger	France	To check the COVID-19 vaccine hesitancy in a representative working-age population	Lancet public health journal	Opinion polls on vaccination intentions suggest that COVID-19 vaccine hesitancy is increasing worldwide; however, the usefulness of opinion polls to prepare mass vaccination campaigns for specific new vaccines and to estimate acceptance in a country's population is limited a survey experiment based on vaccine characteristics was done on reprentative population in france

METHODOLOGY
MATERIAL AND METHODS:
Study subjects / sample:

This study was conducted to assess the knowledge a COVID-19 and the acceptance of COVID-19 vaccine among adults between the age group of 18-60. A sample of adults, aged between 18-60 years those fulfilling the eligibility criteria was selected using Purposive sampling technique which is a type of non-probability sampling.

Eligibility Criteria:
Inclusion criteria:
1. All the eligible subjects who are willing to give consent.
2. All adults between the age of 18-60 years.
3. People who are eligible for COVID-19 vaccine

Exclusion criteria:
1. People who are not willing to give consent.
2. People who are not eligible for COVID-19 vaccine like
3. People who are not between the age of 18-60.

Methodology:

A cross sectional descriptive study was conducted to assess the knowledge and the acceptance of COVID-19 vaccine among adults in Delhi NCR using a validated, self-administered electronic questionnaire that was distributed through emails (Gmail) and online social networking platforms such as WhatsApp, LinkedIn, Telegram. The participants of the study were informed about the objective of the study through the questionnaire itself and their participation in the study was considered as the consent.

Study Area- Delhi NCR

Study Design: Cross-sectional descriptive study

Study duration: January to June 2021

Sample size: The questionnaire was sent to 220 participants using online platforms from which 212 responded

Statistical Analysis- Data obtained was coded and after that it was entered in MS EXCEL 2010. Chi-Square analysis was used. The data was analysed statistically using SPSS software.

Survey Tool - Self-administered Pre-structured and Pre-validated electronic questionnaire was developed for the study. Sampling design- Purposive sampling

RESULT

A web-based cross- sectional descriptive study was conducted to assess the knowledge and acceptance of COVID-19 vaccine among adults aged 18-60 years. Socioeconomic characteristics:

Table-2 showing sociodemographic characteristics

Socio Demographic Characteristics Table			
Variables		**Frequency**	**Percentage**
Education	NOT EDUCATED	13	6.1
	HIGHSCHOOL	20	9.4
	INTERMEDIATE	22	10.4
	GRADUATION	94	44.3
	POST GRADUATION	63	29.7
Marital Status	MARRIED	82	38.7
	UNMARRIED	123	58.0
	DIVORCED	4	1.9
	WIDOWED	3	1.4
Religion	HINDUISM	171	80.7
	ISLAM	22	10.4
	SIKHISM	12	5.7
	CHRISTIANITY	5	2.4
	BUDDHISM	2	0.9

Table-2 shows the sociodemographic characteristics of participants according to these characteristics in total 212 adults completed the study questionnaire, of whom the majority of participants were aged between 20-30. Majority (44.3%) of study participants were reported having a bachelor's degree, 29.7% were reported post-graduate while 10.4%, 9.4%, 6.1% of the population was reported as intermediate,

high school, not educated respectively. Majority of the study population were unmarried (58 .0%) and 80.7% percent of study participants were from Hindu religion.

Table-3 Showing the awareness about Covid-19

Variables		Frequency	Percentage
COVID-19 AWARENESS	YES	207	97.6
	NOT SURE	5	2.4
IS COVID-19 CONTAGIOUS	YES	185	87.3
	NO	5	2.4
	DON'T KNOW	22	10.4
CAUSE OF COVID-19	BACTERIA	1	0.5
	VIRUS	195	92.0
	FUNGI	1	0.5
	DON'T KNOW	15	7.1.

Awareness about COVID-19:

Table-3 shows that from a total of 212 study participants 97.6% were aware about the term Covid-19 while 2.4% were not sure about the term. Majority (87.3%) opted yes to favour that Covid-19 is a contagious disease, 10.4% didn't know about it while 2.4% of the participants opted for no, a larger number of participants (92.5%) chose virus as a causative agent for Covid-19.

Vaccine awareness:
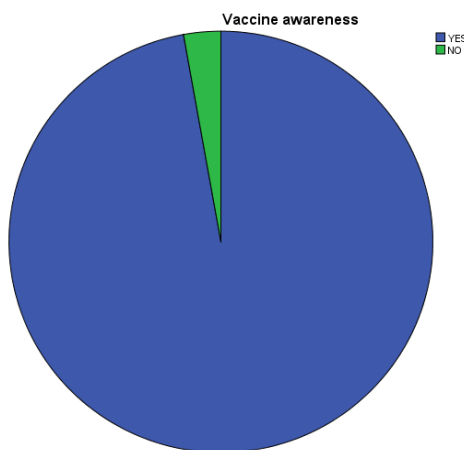
Figure-1

Vaccine awareness

Figure-1,2,3 shows that 97.2% participants were aware about the term vaccination only 2.8% people opted for no, 96.2% of total participants knew that vaccine is available for Covid-19 whereas 3.8% didn't knew about it. Although majority of the study participants were

aware about the status of vaccine when it comes to the question if vaccine can prevent covid the percentage of people who opted for no was 34.4% and 65.6 % opted for yes.
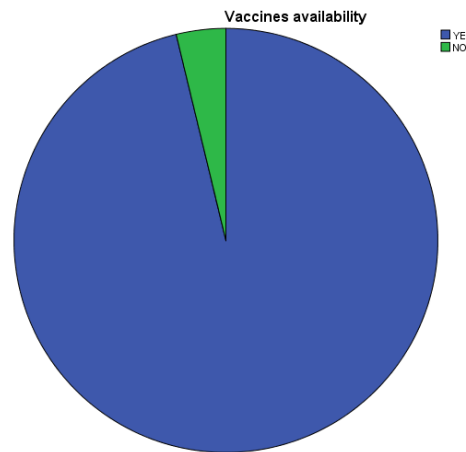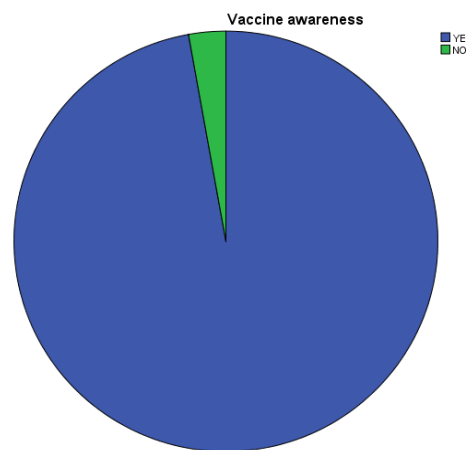
Figure-2:

Vaccines availability

Figure-3:

Vaccine awareness

Attitude towards vaccination:

Table-4 showing that 88.2% of participants were willing to take the vaccination despite their uncertainty about its success only 5.2% were not willing to take the vaccination.

Vaccination status:

Table-4 showing that only 27.8% of the total participants were vaccinated while 60.4% were not the major reasons for that were unavailability of the vaccines and the fear of possible side effects, 11.8% participant were not eligible for vaccination at the time of participation in the study.

Table-4 showing the attitude towards Covid-19 vaccine

Variable		Frequency	Percentage
Vaccination Status	Yes	59	27.8
	No	128	60.4
	Not Eligible	25	11.8
Willingness To Take Vaccine	Yes	187	88.2
	No	11	5.2
	Haven't Decided Yet	14	6.6
Willingness To Pay For Vaccine	Yes	68	33.1
	No	133	62.7
	Not Needed	11	5.2

Relation between education and Covid-19 awareness:

Table-5 shows the relation between the education status and awareness about covid-19 of participants and according to this table although the difference was very less some people who were uneducated or less educated were aware about covid-19 but there were some who were not sure or didn't know much about covid-19.

Table-5 showing the corelation between education and covid-19 awareness in participants:

	Variables	Education					P-value
		Not educated	High school	Intermediate	Graduation	Post-graduation	
Covid Awareness	Yes	08	20	22	94	63	0.192
	Not sure	05	0	0	0	0	
Is Covid Contagious	Yes	9	16	18	86	56	0.070
	No	16	0	0	2	3	
	Don't know	4	4	4	6	4	
Causes Of Covid	Bacteria	1	0	0	0	0	0.059
	Virus	8	17	19	90	61	
	Fungi	0	0	0	0	0	
	Don't know	4	3	3	4	2	
Incubation Period	Less than 2 days	3	4	1	5	0	0.000
	2-3 days	2	9	5	33	18	
	3-14 days	1	2	11	48	44	
	More than 14 days	0	2	2	7	1	
	Don't know	7	3	3	1	0	
Symptoms	Cough	6	5	15	22	9	0.000
	Breathlessness	5	8	13	20	6	
	Fever	8	9	18	24	11	
	Headache	1	0	5	6	7	
	Body ache	1	2	2	5	3	
	Loss of taste and smell	3	4	12	23	7	
	Diarrhea	0	0	0	2	0	
	All	3	9	3	61	48	
	None	0	1	0	1	1	
	Don't know	1	0	0	0	0	
Prevention	Social distancing	2	3	1	11	5	0.003
	Wear mask	0	0	0	0	0	
	Avoid travelling	1	0	0	3	2	
	Washing hands	5	6	3	13	2	
	All	6	10	15	74	55	
	None	0	2	1	2	3	
Transmission	Infected surface	0	1	1	12	5	0.000
	Direct contact	0	0	0	0	0	
	Infected air	2	4	3	2	0	
	All	4	13	13	72	52	
	Don't know	2	0	1	3	4	
At Risk	Old people	2	5	4	18	10	0.000
	Kids	0	0	2	1	3	
	Chronic illness patients	2	5	4	14	6	
	All	4	11	12	68	52	
	None	0	1	0	1	3	
	Don't know	6	1	3	1	0	

Relation between the education status and awareness about Covid-19 vaccine:

Table -6 showing relation between education and covid vaccine awareness

Variable		Education					P-VALUE
		Not educated	High school	Intermediate	Graduation	Post-graduation	
ARE YOU AWARE OF THE TERM VACCINATION	YES	10	19	21	94	62	0.000
	NO	3	1	1	0	1	
VACCINE AVAILIBILITY	YES	13	19	21	91	60	0.927
	NO	0	1	1	3	3	
CAN VACCINE PREVENT COVID	YES	4	14	12	62	47	0.31
	NO	9	6	10	32	16	

Table-6 shows the relation between the education status and awareness about Covid-19 vaccine of the study participants we can see in this table that although majority of people despite their education status were aware about the term vaccination and also knew that there are vaccines available for COVID-19 but many participants opted no for the question if vaccine can prevent covid-19 from those who opted no for this question 9/13 were uneducated.

Table-7 shows the relation between the education status and attitude towards covid-19 vaccine of the study participants this table describes the responses of people of different education status on the questions related to attitude towards Covid vaccination.

Table-7 Showing corelation between education and attitude

Variables		Education					P-VALUE
		Not educated	High school	Intermediate	Graduation	Post-graduation	
VACCINATION STATUS	Yes	3	10	8	18	26	0.118
	No	10	9	12	63	34	
	Not eligible	0	1	2	13	9	
WILLINGNESS TO TAKE VACCINE	Yes	11	19	18	87	52	0.399
	No	0	0	2	4	5	
	Not decided yet	2	1	2	3	6	
VACCINE PREFERENCE	Any vaccine	11	9	14	61	28	0.015
	Indian	2	11	7	25	24	
	Foreign	0	0	1	8	11	
MOTIVATED OTHERS	Yes	2	14	11	60	50	0.000
	No	11	6	11	34	13	
ANYONE IN HOUSE VACCINATED	Yes	3	12	14	61	50	0.003
	No	10	8	8	33	13	
WILLINGNESS TO PAY FOR VACCINATION	Yes	1	9	2	29	27	0.015
	No	10	11	17	61	34	
	Not needed	2	0	3	4	2	

DISCUSSION

Covid-19 or coronavirus is an infectious respiratory disease which is causing more and more damage to the world which is why Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease although many countries have managed to somehow control the situation and currently working towards providing prevention and putting a stop to the further spread of the disease India on the other hand is still in the middle of suffering many people are either dying due to the unavailability of proper treatment for the disease or due to the insufficient medical facilities and equipment's medicines and other things which are necessary for the treatment and prevention of disease are not available and all of this is causing the situation to get worse in India and in the middle of all this chaos the only possible hope to prevent further expansion of disease is that vaccines are available for Covid-19 but now peoples willingness to take the Covid-19 vaccine is a big question because only if majority of

population will agree to take the vaccine than only we will be able to put a stop to this pandemic.

So to check the willingness and acceptance rate and the knowledge about Covid-19 vaccine this study was done among the adults (18-60 years of age) in Delhi NCR and for this a web-based survey was designed using an electronic pre-validated and pre-structured questionnaire and this questionnaire was distributed using various social media platform as a result of this study 88.2% of the total (212) study participants were willing to take the vaccination which shows a huge difference from the other studies which were conducted prior when Covid-19 vaccines were not introduced. A similar study conducted prior the introduction of covid-19 vaccine on the adults living in Kuwait shows only 53.1% of acceptance rate [29].

Another similar study conducted on the population of Delhi shows 79.5% of covid-19 vaccine acceptance rate. The reasons for a high acceptance rate in our study can be 1st this study was conducted after the induction of Covid-19 vaccine to public, 2nd reason can be the current situation in India where mortality and infection rate of Covid-19 is increasing this could have been a major reason of the high acceptance of Covid-19 vaccine because people want to prevent themselves from getting infected from covid. The current vaccination status only 27.8% of the population was vaccination till the time of participation majority of the study participants who were not vaccinated said that vaccine was not available or they were not able to book a slot for vaccination.

The percentage of people who were not willing or was not able to decide whether they want to take vaccination or not was low and majority of them mentioned fear of possible side effects after vaccination as a reason for their unwillingness and some were presently or recently been detected as Covid positive.

The effect of education status on the awareness of participants about covid-19

was different for different questions like for the questions which were general like if they are aware about the term Covid-19 , is Covid contagious and what is the cause of covid-19 the significant level was low the reason can be that in current situation government is promoting and spreading awareness about Covid-19 using various platforms so despite of their education status people have knowledge about covid-19 but when it comes to the question which were placed to check further knowledge like incubation period of Covid-19, symptoms of Covid-19, what can we do to prevent Covid-19, how Covid-19 transmitted and who is more at risk although people despite their education status have knowledge but the people who are highly educated seems to have more accurate knowledge about these question than people who are less or not educated that is why these questions shows high significant level.

Questions about the awareness of the term vaccination shows high significant level people who were highly educated aware of the term in comparison to people who were less educated or not educated while questions about vaccine availability shows low significant level.

In the questions related to the attitude towards Covid-19 vaccines questions which were related to vaccination status and willingness to take vaccines shows low significant level which means there is very low to no relation between education status of a person and attitude towards vaccine but questions related to vaccines preference and have they motivated others, willingness to pay for vaccine shows that people who are highly educated are more aware and also motivating others to take vaccination they are also willing to pay for vaccination as compare to people who are less or not educated.

The reason of the diversity in the significant level for different questions can be that because in current pandemic situation awareness about Covid-19 is being spread through various platform so people

are aware and have knowledge about Covid-19 and its vaccine but the people who are highly educated can compare which knowledge is right and which is wrong while people who are less or not educated are being confused between the pools of various information.

CONCLUSION

In total, 88.2% of our study participants were willing to receive vaccination against COVID-19 once a vaccine becomes available to them, with several factors influencing the level of acceptance. Although the level of vaccine acceptance is high there are some misconceptions related to possible side effects of Covid-19 vaccination between people which need to be addressed to make the vaccine 100% efficient. Such findings are of public health importance and should guide public health efforts in increasing acceptance of vaccination against COVID-19 in the population at large. Although an effective and safe vaccine against COVID-19 is a key element in controlling and bringing an end to the COVID-19 pandemic, ensuring wide acceptability of the vaccine is essential. Hence, public health strategies are urgently needed to address the wide misinformation and conspiracy theories surrounding COVID-19 vaccines. Moreover, transparent communication about vaccine effectiveness and safety will contribute to increasing public trust in future COVID-19 vaccination programs.

Limitations
- The researcher was unable to collect data from entire sample calculated satisfactory due to the current COVID-19 situation. So, it may lack representativeness of the samples. This may have affected the results. The researcher will try to complete the research once situation subsides.
- The views and perspective of the population could have been better assessed by other data collection methods like interviews which was not possible due to COVID-19 situation.

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