

**A CROSS-SECTIONAL STUDY ON ACCEPTANCE AND ATTITUDES TOWARD
COVID-19 VACCINES IN INDIA****¹Vignesh Krishnan Nagesh, ^{2*}Sowparnika Treasa Sabu and ³Vivek Joseph Varughese**¹Clinical Observer, Dept. of Hematology and Oncology, Georgia Cancer Center- Augusta University, Georgia.²Assistant Professor, Dept. of Pharmacy Practice, Ezhuthachan College of Pharmaceutical Sciences, Trivandrum.³MBBS graduate, Government Medical College Thiruvananthapuram.***Corresponding Author: Sowparnika Treasa Sabu**

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Article Received on 21/06/2021

Article Revised on 11/07/2021

Article Accepted on 01/08/2021

ABSTRACT

COVID-19 pandemic as with other previous pandemics is associated with feelings of fears, anxiety, and worries. However, it is unique in terms that people are not worried only about getting infected or transmit the disease to others, but they suffered societal and economic concerns due to the measures that were undertaken by the governments to confine the pandemic and stopping the human-human transmission of the disease. These measures include enforcement of curfews and lockdowns (the largest throughout history), social distancing and self-isolation, schools and universities closures, borders' shutdowns, travel restrictions, and quarantine. Vaccines are effective interventions that can reduce the high burden of diseases globally. However, public vaccine hesitancy is a pressing problem for public health authorities. With the availability of COVID-19 vaccines, it is very important to study about the public acceptability and attitudes towards the COVID-19 vaccines. This study aimed to investigate the acceptability of COVID-19 vaccines and its predictors in addition to the attitudes towards these vaccines among public in India. An online, cross-sectional, and self-administered questionnaire was instrumentalized to survey sample population.

KEYWORDS: Acceptability, Corona virus, Herd immunity, Safety, Vaccine.**INTRODUCTION**

The virus SARS-CoV-2 that causes the infection/disease (COVID-19) has evolved into a pandemic, and as of today, >100 million people globally in over 210 countries have been confirmed to have been infected and two million people have died of COVID-19. Vaccines are one of the most reliable and cost-effective public health interventions ever implemented that are saving millions of lives each year. Following the deciphering of the genome sequence of SARS-CoV-2 in early 2020 and the declaration of the pandemic by WHO in March 2020, scientists and pharmaceutical companies are racing against time in efforts to develop vaccines. With the global coronavirus pandemic in its second year and vaccine safety concerns easing, governments are still struggling to vaccinate their populations to approach herd immunity levels. New variants are emerging as many locales plan to reopen schools, domestic and international travel is increasing, and people relax their vigilance around physical distancing, mask wearing, and other public health interventions.

Equitable access to safe and effective vaccines is critical to ending the COVID-19 pandemic, so it is hugely encouraging to see so many vaccines proving and going

into development. WHO is working tirelessly with partners to develop, manufacture and deploy safe and effective vaccines. Safe and effective vaccines are a game-changing tool: but for the foreseeable future we must continue wearing masks, cleaning our hands, ensuring good ventilation indoors, physically distancing and avoiding crowds.

Vaccine Development

A considerable number of SARS-CoV-2 preventive vaccine projects were initiated shortly after the reporting of this virus, including technologies that generate inactivated virus vaccine, viral protein subunits vaccine, messenger RNA (mRNA) vaccine, DNA plasmid vaccine, and recombinant human adenovirus type 5 (rAd5) or simian adenovirus type 26 (rAd26) expressing SARS-CoV-2 spike protein, non-viral replicating vector expressing SARS-CoV-2 protein vaccine, and also replicating viral vector expressing SARS-CoV-2 protein vaccine. So far, there have been at least 30 announced vaccine projects globally, and vaccines derived from mRNA, expression using recombinant adenoviral vectors, and inactivated virus have already gained regulatory approvals in certain countries.

MATERIALS AND METHODS**Study Design**

A cross-sectional survey-based study was conducted and no consent was obtained as the data were collected and analyzed anonymously. A convenience sample approach was adopted in this study where people from the different parts were invited to participate. Amid the global pandemic, researchers utilized social media platforms to collect data. In this study, online social media platforms (Facebook, WhatsApp) were used to recruit participants.

STUDY PERIOD: 6 months (DEC 2020- MAY 2021).

Instrument Development and Measures

The questionnaire used in this study was developed based on literature review.^[22,31] and discussion within the research team. To reduce potential bias introduced by self-reported data, participants were ensured on the confidentiality and privacy of their responses. A pilot sample (n = 26) was used to improve the wording and clarity of expression of the survey items. Data from the pilot sample was not used in any further analysis.

RESULTS AND DISCUSSION

Table 1: Demographic details of study participants (n = 1000).

Variable	(%)
Age (years)	
18–25 years	22%
26–35 years	55%
> 35 years	23%
Gender	
Male	54%
Female	46%
Marital status	
Single	21%
Married	64%
Others	15%
Having children	
Yes	56%
No	44%
Education	
School education	32%
Undergraduate	45%
Postgraduate	23%
Academic area	
Non health related	77%
Health related	23%
Employment	
Employed	71%
Unemployed	29%
Health insurance coverage	
Yes	33%
No	67%
Smoking status	
Current smoker	23%
Ex smoker	33%
Not a smoker	44%
Have chronic disease	
Yes	74%
No	26%
People tested positive for COVID-19	
Myself	13%
A family member	22%
A friend	42%
Colleague	12%
A neighbor	9%
No one	2%

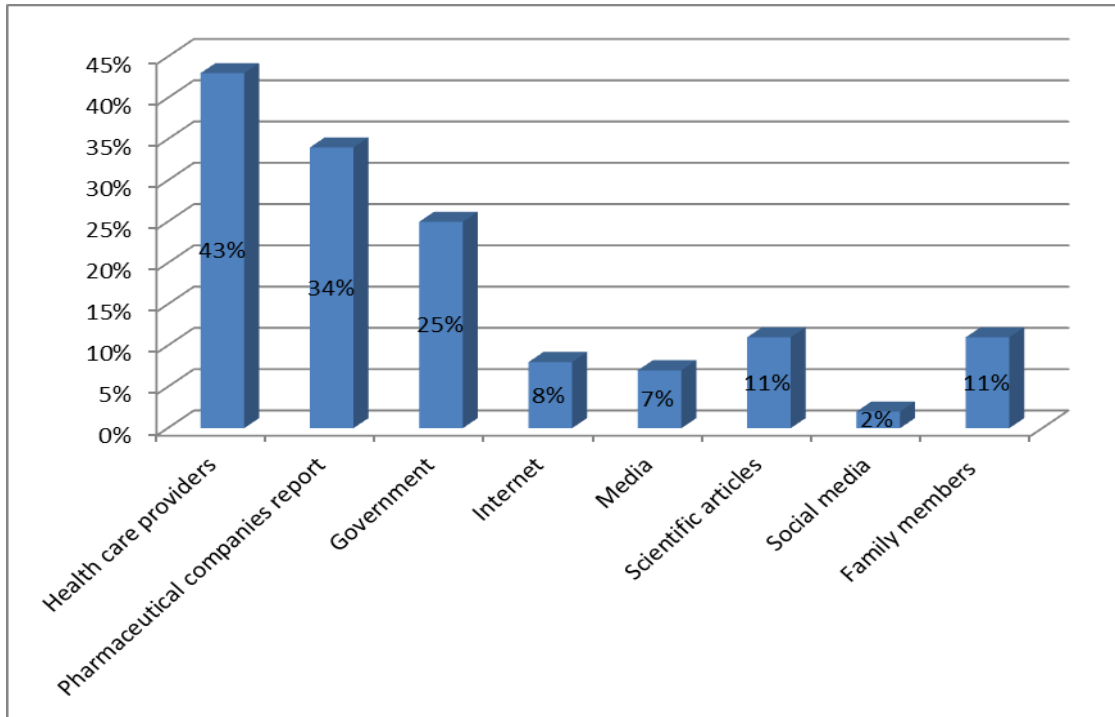


Figure 1: Most-trusted information sources about COVID-19 vaccines.

During the COVID-19 pandemic, people used multiple information resources to gain knowledge and health information about the disease, including television, radio, newspapers, social media, friends, co-workers, healthcare providers, scientists, governments, etc. Since such information sources can shape peoples’ acceptance or refusal of COVID-19 vaccines, it is crucial to

disseminate transparent and accurate information about vaccines’ safety and efficacy to gain the trust of the population especially the hesitant and skeptical ones. Hence, gaining an understanding of the resources that people trust the most to get information about COVID-19 vaccines is critical for the success of any future national vaccination campaign.

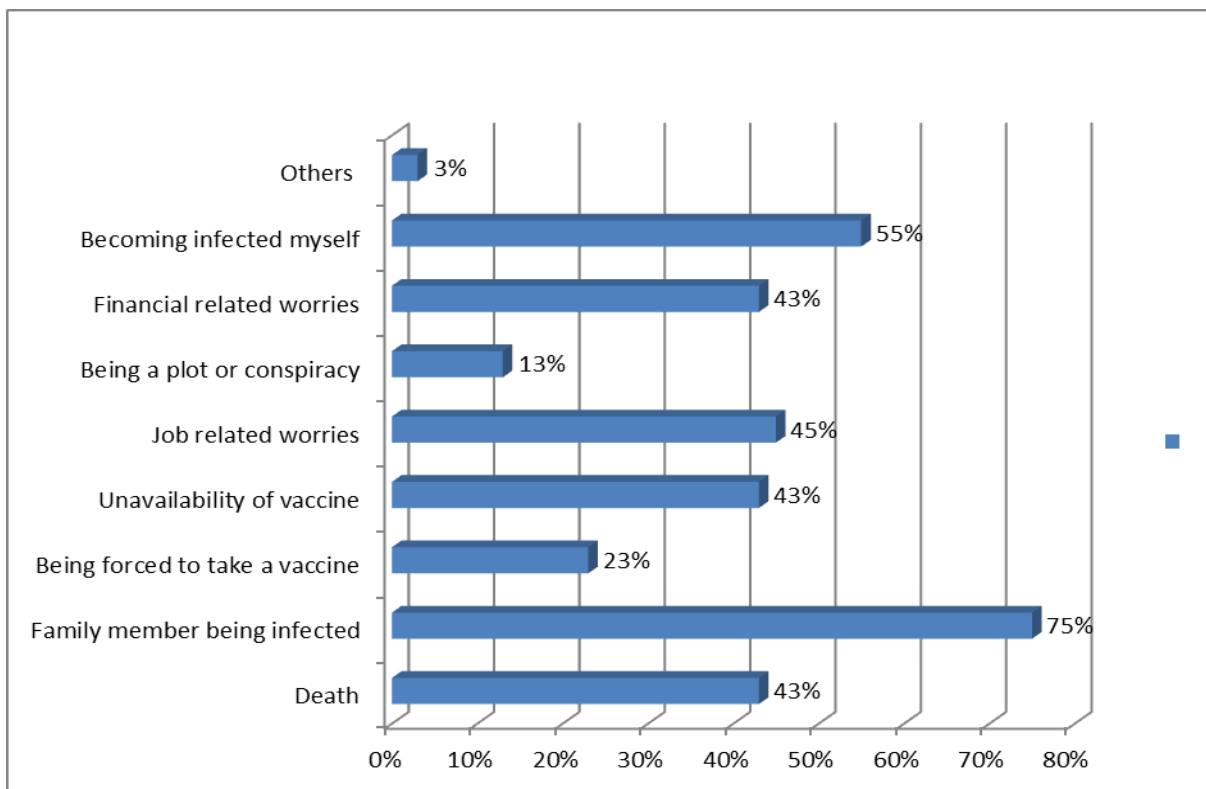


Figure 2: population worries during the COVID-19 pandemic.

Table 2: Attitudes toward COVID-19 vaccines.

Attitude	Agree (%)	Neutral (%)	Disagree (%)
It is important to get vaccination to get protection	65	12	23
Pharmaceutical companies are going to develop safe and effective COVID-19 vaccines	67	11	22
COVID-19 vaccines made in Europe or America are safer than those made in India	54	11	35
Side effects will prevent me from taking a vaccine for the prevention of COVID-19.	34	5	61
The government will make the vaccine available for all citizens for free?	45	10	45
Efficacy of vaccine is more than side effects	70	0	30

An important factor to consider when exploring vaccine acceptability is vaccine convenience in terms of its availability and affordability. In the current study, the willingness to pay for the vaccine was a predictor of vaccine acceptance. This should be factored in the government's planning for vaccination programs and

how acceptance level may change depending on the prices ascribed to the vaccines. In the current study, only 45% believed that the government will be able to provide the vaccine for free, indicating that the economic challenges faced by the Indian government may have played a role in shrinking the acceptance level.

Table 3: Predictors of acceptance for COVID-19 vaccines.

Predictors of acceptance for COVID-19 vaccines		
Factors	OD	P value
Age		
18–25 years	Ref	
26–35 years	0.89	0.14
>35 years	0.34	p < .001
Gender		
Female	Ref	p < .001
Male	1.8	
Employment		
Unemployed	Ref	
Employed	0.45	p < .001
Vaccine safety		
No	Ref	p < .001
Not sure	2.4	p < .001
yes	9.7	p < .001
Willingness to pay for COVID-19 vaccines		
No	Ref	p < .001
Not sure	3.4	p < .001
Yes	18.3	p < .001

In the present study, 67.4% of the public were acceptable, 24 % were not acceptable and 8.6 % were neutral to receive COVID-19 vaccines. As shown in Table 2, the results of multivariate analysis (binary logistic regression) identified the independent factors that predicted the level of acceptance. The result indicated that the older age groups (>35 years old) were less likely to accept for COVID-19 vaccines compared to younger age groups.

In addition, employed participants were more likely to accept COVID-19 vaccines compared to unemployed participants. On the other hand, males were more likely to have acceptance for COVID-19 vaccines compared to females.

Furthermore, participants who stated that vaccines are safe in general were 9 times more likely to accept taking COVID-19 vaccines compared to those who stated that vaccines are not safe (OR = 9.7, p < .001). Moreover, participants who expressed their willingness to pay for COVID-19 vaccines were 18 times more likely to accept taking them compared to those who did not show their willingness to pay (OR = 18.3, p < .001).

CONCLUSION

The COVID-19 pandemic has challenged the world not just in the global health but also the global psychosocial and economic health. This pandemic is testing our resolve to solve challenging situation together. The scientific world has taken on this challenge and is investigating this virus, the COVID-19 disease, and pathogenesis, and have developed systems in

epidemiology, diagnosis, clinical management, and development of vaccines in a timeline that is unprecedented (all within 1 year). The awareness campaigns should also shed the light over the new technology that was utilized in the production of few of them in order to boost COVID-19 vaccines acceptance. Making the vaccine available for free or at subsidized prices by the government could as well enhance vaccines acceptance among the population.

ACKNOWLEDGMENT

Nil.

CONFLICTS OF INTEREST

The authors have no conflicts of interest regarding this investigation.

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