



Beliefs and Barriers Associated with COVID-19 Vaccination Among the Outpatients Attending the Tertiary Care Teaching Hospital in Visakhapatnam City, Andhra Pradesh

NV Teja Ranganadham¹, Nagarjuna P^{2*}, Ajaz Ahmed Dar³, Neha Shaktawat⁴ and Rajendra Singh Bhati⁵

¹Final Year BDS student, Anil Neerukonda Institute of Dental Sciences, Visakhapatnam, Andhra Pradesh, India

²Assistant Professor, Department of Public Health Dentistry, Anil Neerukonda Institute of Dental Sciences, Visakhapatnam, Andhra Pradesh, India

³Resident, Department of Public Health Dentistry, Vyas Dental College and Hospital, Jodhpur, Rajasthan, India

⁴Resident, Public Health Dentistry, Vyas Dental College and Hospital, Jodhpur, Rajasthan, India

⁵MDS Student of Department of Public Health Dentistry Vyas Dental College, Jodhpur, India

*Corresponding Author: Nagarjuna P, Assistant Professor, Department of Public Health Dentistry, Anil Neerukonda Institute of Dental Sciences, Visakhapatnam, Andhra Pradesh.

Received: February 22, 2022

Published: March 08, 2022

© All rights are reserved by Nagarjuna P., et al.

Abstract

Background: Coronavirus Disease 2019 (COVID-19), which is caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), has been on healthcare officials' wish lists all around the world. This study aimed to assess the beliefs and barriers associated with the COVID-19 vaccination among the outpatients attending the Tertiary Care Teaching Hospital of Visakhapatnam city, Andhra Pradesh.

Materials and Methods: This cross-sectional study was carried out during July and August 2021 among the outpatients attending the Tertiary Care Teaching Hospital in Visakhapatnam city, Andhra Pradesh. The significance of the connection (contingency) between COVID-19 vaccination acceptability and sociodemographic variables was determined using the Chi-square test. To find the predicted characteristics of vaccine acceptance, researchers performed logistic regression analysis to obtain the odds ratio (OR) and 95 percent confidence intervals (95 percent CI). Statistical significance was defined as a P-value of less than 0.05.

Result: Out of the 600 participants, 244 (40.7%) were ready to take the vaccine, whenever available whereas 356 (59.3%) showed hesitancy. COVID-19 immunisation was more likely to be resisted by older females with a high level of education and a negative attitude toward vaccination.

Conclusion: The outcomes of this study will assist public health policymakers and concerned government officials in implementing effective ways to promote widespread vaccine adoption. When more information on vaccine safety and efficacy is made available to the public by a trusted, centralized source, vaccine acceptability may improve.

Keywords: Vaccine; Hesitancy; COVID-19; Barriers

Introduction

A safe and effective vaccination for Coronavirus Disease 2019 (COVID-19), which is caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), has been on healthcare authorities' wish lists all over the world [1]. The process of vaccine development is slow and time-consuming and

has to go through multiple checks for potency, efficacy, and safety, particularly in high-risk individuals viz., elderly, pregnant women, and people with co-morbidities, and immunodeficiencies [2].

In addition, the acceptability of the newly launched vaccine is yet another parameter to be considered, since vaccine coverage

rate among the population is essential for a successful immunization program. While preliminary evidence suggests that the licensed vaccines are safe and effective, long-term efficacy and any long-term negative effects are mostly unknown [3].

On January 16, 2021, India initiated a massive immunisation campaign. The health ministry plans to vaccinate four priority groups: healthcare personnel, individuals over 50, public workers, and persons under 50 with comorbidities, with the first two groups receiving vaccinations first in a 30-million-person rollout [4].

Understandably, both healthcare experts and the general public are sceptical of the new vaccine's efficacy. Furthermore, there is a significant anti-vaccine movement, with numerous pseudo-scientific conspiracy theories abounding in media reports. For these reasons, vaccine hesitancy may pose a significant obstacle in the COVID-19 immunisation campaign [5].

The Tertiary Care Teaching Hospital of Visakhapatnam city has reported many cases of COVID-19 and was turned into a COVID Hospital. The outpatients attending the hospital would have a piece of basic knowledge regarding the deadly nature of the disease, and also regarding the need for COVID-19 vaccination as the key to coming out of the pandemic. Because of these factors, this location was chosen to perform the research. The numerous sociodemographic and economic characteristics, as well as the beliefs and barriers that may prove to be roadblocks during the immunisation programme, are examined in this study. To the best of our knowledge, this is the first prospective survey to study beliefs and barriers associated with the COVID-19 vaccine among the outpatients attending the Tertiary Care Teaching Hospital of Visakhapatnam city, Andhra Pradesh. The findings of this research will aid public health policymakers and concerned government authorities in developing and implementing effective mass vaccination methods.

This study aimed to assess the Beliefs and barriers associated with COVID-19 vaccination among the outpatients attending the Tertiary Care Teaching Hospital of Visakhapatnam city, Andhra Pradesh.

Materials and Methods

This cross-sectional study was carried out during July and August 2021 among the outpatients attending the Tertiary Care Teaching Hospital of Visakhapatnam city, Andhra Pradesh. The permission was obtained from the administrative officer of the Teaching care hospital prior to the start of the study.

Inclusion criteria

- The outpatient patients attending the Tertiary Care Teaching Hospital of Visakhapatnam city, Andhra Pradesh during the study duration.
- The study only covered patients who were over the age of 18.
- The study only included patients who had given their informed consent.

Exclusion criteria

- Patients with special needs were not included in the study.
- Patients who refused to cooperate were excluded from the study.

Sampling procedure

The sample size was obtained using a convenient sampling procedure and the number of patients who visited the OPD throughout the study period. All patients who met the inclusion criteria and were present at the Tertiary Care Teaching Hospital on the designated study days (as determined earlier with approval from the authorities) were invited to participate. Individuals' educational backgrounds were as follows: Illiterate, primary, secondary school education, and post-secondary education, which includes Pre-University, Bachelor's degree, and professional education.

Data collection

Data was collected using a self-made, closed-ended questionnaire.

Study duration

Two months

Ethical clearance

The study received ethical approval from the Institutional Review Board. Prior to the start of the trial, study participants signed a written informed permission form for the study was obtained from the Institutional review board. The written informed consent was taken from study participants prior to the start of the study.

Questionnaire

The questions in the questionnaire were divided into three domains: socio-demographic factors, opinions about COVID-19 immunisation, and potential barriers that might prevent people from becoming vaccinated. The questionnaire was translated into a local

dialect. The questionnaire was completed in the presence of the investigator, who has always provided the necessary information.

Questionnaire validation

The questions were pre-tested with a group of 20 people prior to data collection, and no changes were required. The questionnaire’s reliability was tested using the parallel method test. The questionnaire had a Cronbach’s alpha value of 0.87.

Statistical analysis

The Statistical Package for Social Sciences (SPSS) v.24.0 was used to clean and analyse the data (IBM Corporation, Armonk, New York, USA). The demographic data of the participants was presented using descriptive statistics such as frequencies (n) and percentages (%).

Responses were graded on a scale of 0 (highest level of negative belief; anti-vaccination) to 3 (highest level of positive belief; pro-vaccination) (upper-most limit of positive belief; pro-vaccination). To get the total score, the points from each question were added together. A total score of > 2 was regarded positive belief, whilst a total score of 2 was considered negative belief.

The significance of the connection (contingency) between COVID-19 vaccination acceptability and sociodemographic variables was determined using the Chi-square test. To find the predicted characteristics of vaccine acceptance, researchers performed logistic regression analysis to obtain the odds ratio (OR) and 95 percent confidence intervals (95 percent CI). Statistical significance was defined as a p-value of less than .05.

Results

Table 1 shows that more over half of the participants (54.2%) were between the ages of 40 and 59, and 59.3% were female. More-over half of the participants in the study (55%) were illiterate. Other participants worked in occupations with a high risk of COVID-19 infection (healthcare workers = 14.3%; food-related professions, such as catering = 8.7%; foreigner interaction = 2%). Only 24.5 percent of those polled said they had a history of chronic illness.

Beliefs toward COVID-19 vaccination

Table 2 shows that participants are unsure about the safety (56%) and effectiveness (56.7%) of eventual COVID-19 vaccination when it becomes available. The majority, however, felt that taking the vaccine is the best way to avoid COVID-19 problems (47.7 percent). The majority of participants believe that more public knowl-

Characteristics		Frequency (n)	Percentage (%)
Age	18-29	81	13.5
	30-39	156	26
	40-59	325	54.2
	> 60	38	6.3
Gender	Male	244	40.7
	Female	356	59.3
Education	Illiterate	330	55.0
	Primary education	126	21.0
	Secondary education	84	14.0
	University	47	7.8
	Higher education	13	2.2
Occupation	Health care staff	86	14.3
	Catering	52	8.7
	Other jobs	313	52.2
	Not worker (retired, student, housewife).	137	22.8
	Working with foreigners	12	2.0
Do you have any chronic disease	Yes	147	24.5
	No	453	75.5

Table 1: Sociodemographic characteristics of participants (n = 600).

edge regarding the COVID-19 vaccine is required. In conclusion, just one-third of the participants believed that COVID-19 vaccine was beneficial. COVID-19 vaccine acceptance.

The characteristics of people who would accept or refuse COVID-19 vaccination are shown in table 3. Out of 600 people surveyed, 40.7 percent said they want to be vaccinated. When compared to those over 60 years old, those under 30 years old were 1.5 times more likely to accept vaccination (95 percent confidence interval: 1.06-2.33). Participants with a primary education or no education were 2.19 (95 percent confidence interval: 0.85-5.62) and 2.89 (95 percent confidence interval: 0.46-18.24) times more likely to accept vaccination, respectively. Furthermore, male participants were 1.2 times more likely than female participants to accept vaccination (95 percent confidence interval: 1.01-1.44).

Positive thoughts were associated with a significant increase in the odds of being vaccinated. In this case, the participants with positive beliefs toward COVID-19 vaccination were 9.288 times more likely to accept vaccination if available (95% CI: 7.72-11.17).

Beliefs toward COVID-19 vaccination		N (%)
Do you think that COVID-19 vaccination, whenever available, would be safe?	Yes	180(30.0)
	No	84 (14.0)
	Not sure	336 (56.0)
Do you think that the COVID-19 vaccine, whenever available, would be effective	Yes	210(35.0)
	No	50 (8.3)
	Not sure	340(56.7)
Do you think that the best way to avoid the complications of COVID-19 is by being vaccinated?	Yes	286(47.7)
	No	162(27.0)
	Not sure	152(25.3)
Do you think that greater public awareness is needed about the COVID-19 vaccine	Yes	519(86.5)
	No	81 (13.5)
If COVID-19 vaccination is available, are you planning to get it?	Yes	244(40.7)
	No	356(59.3)

Table 2: Participants’ beliefs toward the safety of COVID-19 vaccination (n = 600).

Variable		Planned to obtain COVID-19 Vaccination		OR	95% CI	P
		Yes (%)	No (%)			
Total		244(40.7%)	356(59.3%)			
Age	18-29	38(46.9%)	43 (53.1%)	1.57	1.06-2.33	0.024*
	30-39	61(39.1%)	95(60.9%)	0.9	0.63-1.29	0.566
	40-59	132(40.6%)	193(59.4%)	1.01	0.76-1.47	0.736
	> 60	13(34.2%)	25(65.8%)	-	-	-
Gender	Male	99(40.6%)	145(59.4%)	1.2	1.01-1.44	0.04*
	Female	145(40.7%)	211(59.3%)	-	-	-
Education	Illiterate	139(42.1%)	191(57.9%)	2.89	0.46-18.24	0.260
	primary education	55(43.7%)	71(56.3%)	2.19	0.85-5.62	0.104
	secondary education	27(32.1%)	57(67.9%)	1.75	1.26-2.44	0.001*
	University	18(38.3%)	29(61.7%)	1.3	1.06-1.59	0.014*
	Higher education	5(38.5%)	8(61.5%)	-	-	-
Occupation	Healthcare Workers	30(34.9%)	56(65.1%)	1.36	0.17-1.69	0.285
	Catering	22(42.3%)	30(57.7%)	0.73	0.21-2.6	0.627
	Other jobs	134(42.8%)	179(57.2%)	1.15	0.61-2.17	0.670
	Unemployed	52(38.0%)	85 (62.0%)	0.99	0.52-1.89	0.977
	Working with foreigners	6(50.0%)	6 (50.0%)	-	-	-
Do you have any chronic disease	Yes	67(45.6%)	80(54.4%)	0.95	0.78-1.17	.549
	No	177(39.1%)	276(60.9%)	-	-	-

Table 3: Predicting factors of COVID-19 vaccine acceptance.

Nationalities, vocations, and chronic diseases, on the other hand, were unable to predict vaccination behaviour (P-value > 0.05), as shown in table 3.

Barriers associated with COVID-19 vaccination

Table 4 shows the barriers associated with acceptance of COVID-19 vaccination. Approximately 12% of people have doubts about vaccination’s effectiveness. One-fifth of the precipitants be-

lieved in the COVID-19 conspiracy theory, while the rest believed that vaccines are unneeded because they follow strict personal cleanliness and social distancing techniques, or because they consider themselves healthy and not at risk.

Moreover half of vaccine sceptics (54.2 percent) said they would accept to be vaccinated if more research proved the safety and effectiveness of COVID-19 immunisation. Only 6% of vaccine

Barriers	Vaccine refusers n = 356(59.3%)	
I am concerned about the vaccine’s side effects	242	68
I don’t believe that the vaccine will stop the infection	41	11.5
I don’t need the vaccine because I do all the right things. I wash my hands and wear a mask and gloves.	32	8.9
I don’t like needles.	7	2
The COVID-19 vaccine is a conspiracy.	4	1.1
I don’t need the vaccine because I’m young and healthy.	22	6.2
Other	8	2.2
Options to encourage future COVID-19 vaccination		
If my physician recommended it to me	36	10.1
If it was mandatory by my job	22	6.2
If it was compulsory by the government (MOH)	73	20.5
If my family or friends got vaccinated	15	4.2
If I know that more studies showed that the vaccine is safe and effective	193	54.2
I would not take it in any situation	9	2.5
If there is a way other than injection	4	1.1
Other	4	1.1

Table 4: Participants’ barriers associated with acceptance of COVID-19 vaccination.

refusers will agree to vaccination if it is made mandatory by the government, but 20.5 percent will accept if it is made mandatory by employers. Furthermore, one-tenth of vaccine sceptics will accept vaccination if doctors recommend it. In any of the aforementioned scenarios, about 2.5 percent of vaccine refusers will refuse to receive the vaccination.

Discussion

This study sought to examine the beliefs and barriers associated with COVID-19 vaccination among the outpatients attending the Tertiary Care Teaching Hospital of Visakhapatnam city, Andhra Pradesh. The study’s findings revealed that when vaccines were offered, the sample group was split between those who accepted

them and those who refused them. Out of 600 individuals, 244 (40.7%) were willing to take the vaccination as soon as it became available, whereas 356 (59.3%) were hesitant.

Our results indicate that more than half of the sample population (59.3%) were not willing to be vaccinated. The main reason for hesitancy was the concern regarding the vaccine’s side effects (68%). This finding is similar to that of other studies conducted in India [6-8] Egypt [9,10] China [11], the USA [12], and Saudi Arabia [13]. The next major reason for vaccine refusal among the participants is the belief that vaccination will not stop the infection from occurring (11.5%).

Older females with a high level of education and a negative

attitude toward vaccination were more likely to resist COVID-19 vaccination. Notably, being a member of a high-risk group had no effect on vaccination rates [14]. The subject's acceptance of the COVID-19 immunisation was unaffected by his or her employment in the healthcare industry. The reason for this was, predictably, concern about the vaccine's safety, given its rapid development [15].

Another impediment to COVID-19 vaccination was the COVID-19 conspiracy hypothesis, which quickly propagated around the world via social media. This scenario may suggest that future studies should utilise a different sampling population via purposive sampling, with possible participants' susceptibility to conspiracy theories tested first [16].

Among the 40.7% of participants who were planning to get the COVID-19 vaccine, 79% were educated less than high school. This has also been emphasized in a study done in Saudi Arabia which reveals that more than half of the study participants willing to get the COVID-19 vaccine were educated less than high school [17]. This result is similarly consistent with the findings of a similar study conducted in India [18].

This study also revealed many factors associated with vaccine acceptance, the most significant being holding positive beliefs. A positive attitude that vaccination is the key to controlling the COVID-19 pandemic is seen in the majority of the participants who were willing to take the vaccine. Another positive predictor of COVID-19 vaccine uptake was male gender. Approximately 41% of the study's male participants were willing to receive the vaccine. This could be owing to the high rates of COVID-19-related morbidity and motility among male infected patients that have been observed. Furthermore, women are more likely than males to believe in conspiracy theories, which could be one of the reasons for women's higher vaccination resistance [19].

Age was another positive predictor of COVID-19 vaccine uptake. Nearly 47 percent of the individuals in the 18-29-year-old age group were willing to receive the vaccine. In contrast to older participants, younger participants were more tolerant of vaccination. One possible explanation is that younger people are more dissatisfied by the COVID-19 crisis' social constraints and curfews, and thus are more ready to be vaccinated. In contrast to their elder counterparts, younger individuals may be more acclimated to and trusting of science and technology. At the same time, school suspension may have a negative impact on school-aged and university

students' academic performance. As a result, they are more eager to put a stop to the crisis and, as a result, are more accepting of vaccination [20].

The majority (54 percent) of vaccine refusees claimed that they needed more study and studies to demonstrate the safety and efficiency of vaccination before accepting it, which is in line with earlier research in Saudi Arabia²¹. This conclusion could be explained in part by the fact that the majority of participants (68 percent) were concerned about the prospective vaccine's different side effects. Nearly 21% of vaccine refusees say they would accept vaccination if it were made mandatory by the government, and 10% say they would take immunisation if their doctor advised it. Finally, 2.5 percent of vaccine refusalists will refuse to take the COVID-19 vaccination in any condition.

Although there has been few research on COVID-19 immunisation hesitation, acceptance and hesitancy rates for any vaccine vary widely around the world. Similarly, the percentage of people who were hesitant to have COVID-19 vaccine in the current study (59.3%) was higher than the percentages reported for China [14], Egypt [10,12], the United Kingdom [17], the United States [19], and Saudi Arabia [20]. This finding highlighted the need for additional measures to boost future COVID-19 vaccination uptake, maybe by strengthening perceptions about eventual COVID-19 vaccination in particular and immunisation in general [20].

Given that vaccination is the cornerstone of the COVID-19 pandemic's reduced healthcare burden, the study's findings can be used to organise evidence-based immunisation programmes while waiting for vaccine development. Enhancing people's vaccination attitudes and understanding the hurdles to COVID-19 vaccination acceptance will most certainly increase people's acceptance, resulting in maximum vaccine uptake when it becomes available [21].

Conclusions

This is one of the first cross-sectional studies in India to look at people's knowledge, facilitators, and barriers to the COVID-19 immunisation in order to determine vaccine acceptability and hesitancy. Concerns concerning vaccine uptake were raised in the study, which could have an influence on the mass immunisation programme. The rapid development of the COVID-19 vaccination may have heightened public anxiety. Depending on sociodemo-

graphic characteristics, the level of awareness and acceptance of the COVID-19 vaccine varies. The most crucial component in vaccination anxiety is the presence of adverse consequences after inoculation.

The findings of this study will assist public health policymakers and concerned government authorities in adopting effective vaccination adoption strategies. Vaccination acceptability may improve if more information about vaccine safety and efficacy is made available to the public through a trustworthy, centralised source. Efforts must also be taken to stop the spread of vaccine misinformation. To reduce low vaccination rates, educational efforts must be directed at persons who are at a higher risk of vaccine aversion.

Similar longitudinal studies should be undertaken to gain insights into people's views and concerns regarding the vaccination, as well as the changing circumstances in India, as this is a cross-sectional study that provides a snapshot of community responses at a specific point in time.

Acknowledgement

We acknowledge that this research was given financial support by NTRUHS University as the part of their UGSRs 2021.

Bibliography

1. Chakraborty I and Maity P. "COVID-19 outbreak: Migration, effects on society, global environment and prevention". *Science of the Total Environment* 728 (2020): 138882.
2. World Health Organization. "WHO SAGE Roadmap for Prioritizing uses of COVID-19 Vaccines in the context of limited supply". Geneva, Switzerland (2020).
3. WHO Coronavirus Disease (COVID-19) Dashboard (2020).
4. "Covid-19. Indian health officials defend approval of vaccine". *BMJ* 372 (2021): n52.
5. Bohme S., et al. "Once we have it, will we use it? A European survey on willingness to be vaccinated against COVID-19". *The European Journal of Health Economics* 21.7 (2020): 977-982.
6. Jyoti Jain., et al. "COVID-19 vaccine hesitancy among medical students in India". *Epidemiology and Infection* 149.e132 (2021): 1-10.
7. Hilal Hamid Mir., et al. "Using structural equation modeling to predict Indian people's attitudes and intentions towards COVID-19 vaccination". *Diabetes and Metabolic Syndrome: Clinical Research and Reviews* 15 (2021): 1017-1022.
8. Andrew Marvin Kanyike., et al. "Acceptance of the coronavirus disease-2019 vaccine among medical students in Uganda". *Tropical Medicine and Health* 49 (2021): 37.
9. Abanoub Riad., et al. "Global Prevalence and Drivers of Dental Students' COVID-19 Vaccine Hesitancy". *Vaccines* 9 (2021): 566.
10. Shimaa M., et al. "Vaccine hesitancy: Beliefs and barriers associated with COVID-19 vaccination among Egyptian medical students". *Journal of Medical Virology* (2021): 1-12.
11. Michaël Schwarzinger., et al. "COVID-19 vaccine hesitancy in a representative working-age population in France: a survey experiment based on vaccine characteristics". *Lancet Public Health* 6 (2021): e210-221.
12. Samar Fares., et al. "COVID-19 Vaccination Perception and Attitude among Healthcare Workers in Egypt". *Journal of Primary Care and Community Health Volume* 12 (2021): 1-9.
13. Archana Kumari., et al. "Knowledge, barriers and facilitators regarding COVID-19 vaccine and vaccination programme among the general population: A cross-sectional survey from one thousand two hundred and forty-nine participants". *Diabetes and Metabolic Syndrome: Clinical Research and Reviews* 15 (2021): 987-992.
14. Chao Wang., et al. "Vaccination willingness, vaccine hesitancy, and estimated coverage at the first round of COVID-19 vaccination in China: A national cross-sectional study". *Vaccine* 39 (2021): 2833-2842.
15. Marie Pierre Tavoracci., et al. "COVID-19 Vaccine Acceptance, Hesitancy, and Resistancy among University Students in France". *Vaccines* 9 (2021): 654.
16. Tamam El-Elimat., et al. "Acceptance and attitudes toward COVID-19 vaccines: A cross-sectional study from Jordan". *PLoS ONE* 16.4 (2020): e0250555.
17. Susan M. Sherman., et al. "COVID-19 vaccination intention in the UK: results from the COVID-19 vaccination acceptability study (CoVAccS), a nationally representative cross-sectional survey". *Human Vaccines and Immunotherapeutics* 17.6 (2020): 1612-1621.

18. Holly Seale., *et al.* "Examining Australian public perceptions and behaviors towards a future COVID-19 vaccine". *BMC Infectious Diseases* 21 (2021): 120.
19. Ana Karina Mascarenhas., *et al.* "Dental students' attitudes and hesitancy toward COVID-19 vaccine". *Journal of Dental Education* (2021): 1-7.
20. Magadmi RM and Kamel FO. "Beliefs and Barriers Associated with COVID-19 Vaccination Among the General Population in Saudi Arabia". *BMC Public Health* 21.1(2021):1438.
21. Bhartiya S., *et al.* "Knowledge, attitude and practice towards COVID-19 vaccination acceptance in West India". *International Journal of Community Medicine and Public Health* (2021): 8.

Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

Website: www.actascientific.com/

Submit Article: www.actascientific.com/submission.php

Email us: editor@actascientific.com

Contact us: +91 9182824667