

Research Article

COVID-19 Vaccine-Acceptancy among Health Care Workers and General Community in a Southern City of India: Pre- and Post-arrival of Vaccines

Mudassir Azeez Khan¹, Sushantha Perduru², Supriyalaxmi N Totiger³, BM Snehalatha⁴,
Thulasi M⁵, Harshini Suresh⁶, Sunmathi D⁷

¹Professor and Head, ^{3,7}Senior Resident, ^{4,5,6}Junior Resident, Department of Community Medicine, Mysore Medical College and Research Institute, Mysore, Karnataka, India.

²Assistant Professor, Department of Community Medicine, A.J. Institute of Medical Sciences and Research Centre, Mangalore, Karnataka, India.

DOI: <https://doi.org/10.24321/2454.325X.202116>

I N F O

Corresponding Author:

Mudassir Azeez Khan, Department of Community Medicine, Mysore Medical College and Research Institute, Mysore, Karnataka, India.

E-mail Id:

mudkhan@gmail.com

Orcid Id:

<https://orcid.org/0000-0002-3625-6249>

How to cite this article:

Khan MA, Perduru S, Totiger SN, Snehalatha BM, Thulasi M, Suresh H, Sunmathi D. COVID-19 Vaccine-Acceptancy among Health Care Workers and General Community in a Southern City of India: Pre- and Post-arrival of Vaccines. Int J Preven Curat Comm Med. 2021;7(4):8-12.

Date of Submission: 2021-11-18

Date of Acceptance: 2021-12-20

A B S T R A C T

Context: By December of 2021, 80% of the eligible Indian population had received at least one shot of COVID-19 vaccine. However, this phase of vaccination was hindered with the very prevalent vaccine hesitancy and, in its absence, India would have reached this mark of coverage much earlier. Vaccine skepticism is still present, especially around vaccination of children and it may further delay coverage in our next phase of vaccination.

Methods and Material: A total of 680 healthcare workers (HCWs) and 1,308 General public (the community) were interacted with in a South Indian city between the months of December 2020 and February 2021. An online-platform based survey was conducted where vaccine acceptancy levels were studied among them before and after vaccine roll out in the country. The reasons for acceptance as well as hesitancy were surveyed. Simultaneously, vaccine awareness activity was conducted.

Results: The overall vaccine acceptance among the HCWs was reflected to be 68.5% & in the community it was found to be 60.4% at the time of vaccine rollout. Nearly half, i.e., 51.6% of the HCWs and 50.58% in the community, expressed the reason for hesitancy as the fear of side effects.

Conclusions: Carrying out Mass-vaccination activities without adequately assessing the acceptancy levels among its beneficiaries and taking measures to allay the reasons for hesitancy will lead to delayed coverage and an ineffective vaccination drive which is an ultimate failure of purpose. Need of the hour is an effective communication & health education measure that would address all the concerns related to COVID-19 vaccine.

Keywords: COVID-19, SARS-CoV-2, Vaccine, Vaccine-acceptancy, Vaccine-hesitance, Vaccine-literacy

Introduction

The COVID-19 pandemic has already overwhelmed healthcare systems, undermined economic activities and instilled fear in people worldwide, more so in developing countries like India. Globally, health care providers are racing in developing and deploying measures to break the chain of transmission.

Over the past century, vaccination has become a routine and effective preventive measure in reducing the rates of several infectious diseases worldwide. Besides providing direct immunity to the vaccinated individuals, vaccination has shown to reduce infection and its severity even among the unvaccinated through herd immunity if a sufficient proportion of the population is immune.¹

Various control measures, especially vaccination, have helped flatten the COVID-19 epidemic curve across the globe. Mass Vaccination against SARS-CoV is the most critical action being under taken in combating further waves of COVID-19. But the potential of this vaccine is getting threatened by the rising vaccine skepticism which may present challenges to widespread vaccine uptake.

Vaccine hesitancy, a phenomenon of doubt over the vaccines' claimed efficacy and/ or safety amidst access to vaccination, has emerged as a major challenge for global health. In India, hesitancy towards indigenously developed vaccines was aggravated by the lack of peer-reviewed phase III trial data before the start of vaccination.²

Factors like lack of public transparency of regulatory bodies, and public perception of inappropriately expedited processes may have either intensified hesitancy towards all vaccines in general or may have exacerbated reluctance towards specific vaccines. Despite multidisciplinary efforts at tackling Vaccine hesitancy, it had been widespread in India for a significant part of 2021.² Empirical evidence suggests that vaccine uptake is crucially hindered by vaccine hesitancy. Vaccine hesitancy (i.e., any delay in acceptance or refusal of vaccine despite the availability of vaccination services) has been rated among the top 10 global Public Health threats by the World Health Organization (WHO). Causes of vaccine hesitancy are heterogeneous and include, inter alia: religion, culture, gender, accessibility to vaccines, trust issues, and so on.³

As on 25th of December, 2021, 80% of the eligible Indian population, i.e., individuals above the age of 18 years, has received at least one shot against Covid-19 and 60% is vaccinated with two doses.⁴ However, this phase of vaccination was hindered with vaccine hesitancy among the beneficiaries. Had measures been taken to address it, India would have reached this mark of coverage much earlier. Vaccine skepticism which is still present, especially around vaccination of children, may present challenges

to vaccine acceptance and uptake and delay coverage. In 2022, India is moving to another phase of vaccination, where the beneficiaries are the children and precautionary (booster) dose of vaccine will be given to individuals already vaccinated with two doses. This phase comes with its own challenges and vaccine hesitancy, without doubt, is expected to be much higher especially for children. It is time we take more stringent measures to address this threat.

Material and Methods

A Cross-sectional study was conducted pertaining to vaccine acceptancy for a period of three months which spanned between December of 2020, much ahead of the vaccine roll out process in India, and February of 2021, which was two months post the start of mass-vaccination.

Sample

The study population included Healthcare workers [Doctors (ranging from Resident doctors to Professors), Interns, Medical school undergraduates, Mid-Level Health Providers and Grass-root level workers], who were/are actively involved in Covid-19 screening and patient care in the city of Mysuru. The study was also extended to include the Community (general population), especially in the field practice area of Mysore Medical College and Research Institute, which consists of 5 wards. Probability proportional to size sampling was used to obtain the samples from each ward and convenient sampling was done to select households within each ward. A total of 680 Healthcare workers and 1,308 general public (community) were involved in the survey.

Instrument and Data Collection

An online platform was used to facilitate the study. Questionnaire was prepared in two languages viz. English and the local language: Kannada. Content and face validation of the questionnaire was done prior to the start of the survey. Ethical clearance was obtained from the Institutional Ethics Committee of Mysore Medical College & Research Institute, Mysuru. Piloting was done and the shortcomings were addressed before the actual survey was taken up. A set of questions regarding the knowledge on vaccine and people's stand on its acceptance was assessed. Furthermore, reasons for the hesitancy, myths and misconception related to vaccines were also noted.

Co-WIN is the online portal being used for the process of registration, tracking of vaccination process and vaccination status of the beneficiaries.⁵ The data regarding the proportion of registered beneficiaries who received vaccination were available in this online portal. In addition to this, vaccination sites were visited and the process of vaccination itself was observed and the proceedings were noted down. The survey was concluded by the 3rd week of February 2021.

Data Analysis

Data was entered in MS Excel and analyzed using in frequencies and percentages. Chi-Square test was used to assess association between Vaccine- hesitancy/acceptance and beneficiaries being Health care workers or general public.

Result

The overall vaccine acceptance among the HCWs was reflected to be 68.5% and in the community it was found to be 60.4% in the initial phase of vaccination (Figure 1). The highest proportion of acceptance (77.2%) was displayed by the grass root level workers belonging to healthcare sector; followed by Medical school undergraduates (76.5%) and Interns (71.5%). Least acceptance was observed among Mid-Level Health Providers (43.02%). Proportion of vaccine acceptance among doctors (ranging from resident doctors to professors) was found to be 64.6%. It is interesting to know that 37.1% of the surveyed population were willing to get vaccinated while still being unsure about the efficacy of the vaccine. 21.67% of the HCWs and 55.06% of general public were of the opinion that “vaccine provides better immunity than natural infection”. 8.23% believed that mask usage could be avoided after vaccination.

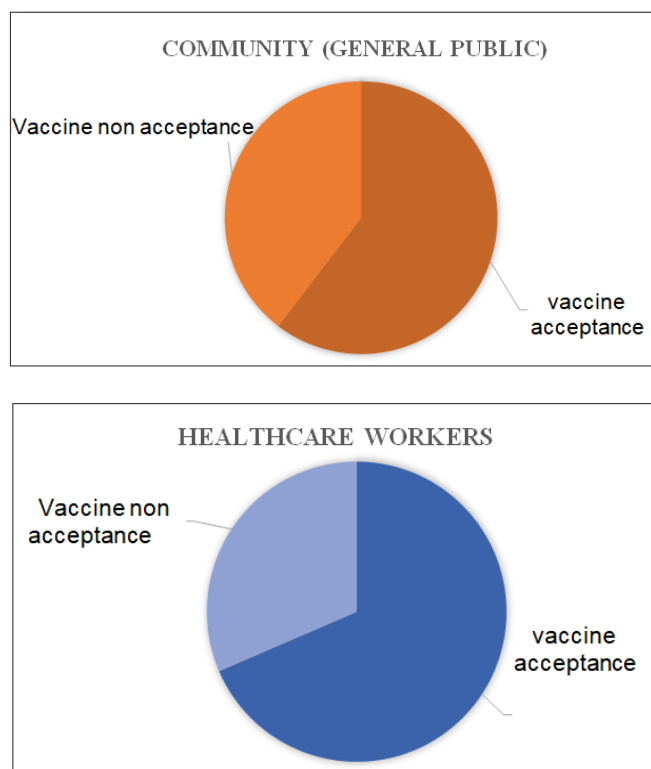


Figure 1. Pie charts Depicting Vaccine Acceptance among Healthcare Workers & Community in General in the City of Mysuru, India

Vaccine hesitancy among the HCWs was 31.5% and in the community it was found to be slightly higher at 39.6%. Nearly half, i.e., 51.6% of the HCWs and 50.58% in the community, expressed the reason for hesitancy as the fear of side effects. Other quoted reasons for reluctance were „I do not fall under the high risk category for COVID-19“, „I do not fall under the high-risk category for COVID-19“ and „I do not think the vaccine is of any use to me“. Another 9% of HCWs and 6.75% of general public displayed aversion based on the belief that vaccination is not necessary for previously infected individuals (Table 1).

Table 1. Reason for Vaccine Acceptance & Vaccine Hesitancy among the Healthcare Workers & General Public

	Community (1308)		Healthcare Workers (680)	
	N	%	N	%
Reasons for vaccine acceptance				
Vaccine helps me avoid mask usage	125	15.82	3	0.64
Vaccine provides better immunity than natural infection	435	55.06	101	21.67
Vaccine provides some immunity to uninfected	181	22.91	165	35.4
Because I have comorbidities.	30	3.79	151	32.4
For certification purpose	15	1.89	36	7.72
Others	4	0.5	10	2.21
Total	790	100	466	100
Reasons for vaccine hesitancy				
I am afraid of side effects	262	50.58	110	51.6
I believe that vaccine is of no use at all	111	21.43	69	32.2
I have had Covid-19 in the past	35	6.75	19	9.0
My antibody titers against Covid-19 are high	59	11.38	7	3.3
I do not fall under the 'high risk category' for Covid-19	49	9.45	9	4.0
Others	2	0.38	0	0
Total	518	100	214	100

Further analysis to see if there is any difference in vaccine acceptancy/ hesitancy levels between HCWs & General Public showed that there is no significant difference between the two groups of vaccine beneficiaries (Table 2). This shows that even within the Health care community, the hesitancy is similar to that of the general public.

Table 2. Association between Vaccine Acceptancy/ Hesitancy Levels among HCWs & General Public

	Vaccine Acceptancy	Vaccine Hesitancy	Total
Healthcare Workers	69 (64.50) [0.31]	31 (35.50) [0.57]	100
General Public	60 (64.50) [0.31]	40 (35.50) [0.57]	100
Total	129	71	200 (Grand Total)

Note: Each cell shows: the observed cell totals, (the expected cell totals) and [the chi-square statistic for each cell].

The chi-square statistic is 1.77. The p-value is .18 (df= 2, level of significance=0.05). There is no significant difference in vaccine acceptancy/ hesitancy levels between HCWs & General Public.

Discussion

Almost 16% of the HCWs and only 6.1% general public believed that the vaccination is adequate for 'high risk' and 'vulnerable' population alone; whereas 28.8% of the HCWs & 16.8% in community inclined towards mandatory vaccination for all. This attitude of mandatory vaccination may be borne out of the age-old practice in low- and middle-income countries, where health is considered as a state's responsibility. However, informed decision making based on the transparent facts (to be provided by industry leaders and policy makers) should be encouraged at all the levels.⁶ This informed decision making can be facilitated by providing appropriate "Information, Education, Communication" materials.

There were some uninfected healthcare workers (susceptible population) in our study who refused vaccination stating, "I did not suffer from COVID-19 even when the pandemic was at its peak. So, I will not get it." This is nothing but optimism bias, which has to be anticipated in a larger magnitude in the community with lower disease transmission/ prevalence leading to susceptible population remaining vulnerable to infection, posing threat to pandemic control.

Non-inclusion of "local authorities" (as a set of beneficiary themselves) in the initial phases of vaccination had raised queries in the minds of vaccine beneficiaries viz. one of them stated, "If vaccine was good enough, there is no way our politicians would have given it to someone else." Although this is a sensitive aspect, this has to be addressed as it is one of the key determinants of a successful vaccine drive.

Vaccine-hesitancy gave rise to unique bioethical challenges in global health especially in low- to middle-income countries (LMICs) like India. Sarkar et al in his review stated some of the reasons for vaccine hesitancy as: Improper vaccine approval procedures that raised doubts in people's minds, lapses in informed consent processes for vaccination, inequitable vaccine distribution and an unclear balance between beneficence and non-maleficence.²

At the culmination of phase 1 (at the end of January), 47% of the beneficiaries received first dose of the vaccine in the study setting.⁵ During the vaccination, beneficiaries with comorbidities were given special attention because of non-availability of the data on safety of the vaccine among various sub-groups. Individuals with uncontrolled diabetes mellitus and hypertension opted out of vaccination. The studies conducted in various parts of the world have shown that the vaccine acceptance was seen to reduce further in individuals with lower educational status.^{7,8} There was a clear 20% drop in the vaccine acceptance before and after the roll out of phase 1 vaccination. This may be due to "group thinking" overpowering the individual thinking (Bandwagon bias). Community being educationally diversified may have mixed responses leading to amplification of the Bandwagon bias.

To add to this, there was, and is, the influence of mass media, which had presented wrongly interpreted post-vaccination figures and situations without any medical knowledge. These aspects might have raised questions in the community regarding competency of the vaccine, consistency and sincerity of the authorities posing a serious threat to faith in the vaccine and its purpose. These being key determinants of trust need to be addressed urgently, so as to lower any drop in vaccine acceptance in the community especially for children.⁹

Conclusion

Carrying out mass-vaccination activities without adequately assessing the acceptancy levels among its beneficiaries and taking measures to allay the reasons for hesitancy will lead to delayed coverage and an ineffective vaccination drive which is an ultimate failure of purpose. With the vaccination drive being a voluntary process, it would be a herculean task to convince people to get vaccinated unless we address all their queries & apprehensions in time. Mere on-paper communication strategies are not going to bring people to the vaccination centers.

Need of the hour is an effective communication and health education measure that would deliver the appropriate and timely message in an efficient manner addressing all concerns related to COVID-19 vaccine, especially with regards to vaccination of children and thus increasing Vaccine-literacy among the beneficiaries.

Acknowledgement

We thank the members of the District Administration, District Health Authority, Mysuru; Nazarbad Health Center; Hosakote Health Center; World Health Organization: Surveillance Unit, Mysuru, Karnataka, India for their valuable support.

Conflicts of Interest: None

References

1. Randolph H, Barreiro L. Herd Immunity: Understanding COVID-19. *Immunity*. 2020;52(5):737-741. [PubMed] [Google Scholar]
2. Sarkar M, Ozair A, Singh K, Subash N, Bardhan M, Khulbe Y. SARS-CoV-2 vaccination in India: Considerations of hesitancy and bioethics in global health. *Ann Glob Health*. 2021;87. [PubMed] [Google Scholar]
3. Nath R, Imtiaz A, Nath S, Hasan E. Role of vaccine hesitancy, eHealth literacy, and vaccine literacy in young adults' Covid-19 vaccine uptake intention in a lower-middle-income country. *Vaccines*. 2021;9(12):1405. [PubMed] [Google Scholar]
4. MoHFW [Internet]. [cited 2021 Dec 27]. Available from: <https://www.mohfw.gov.in/>
5. CO-WIN Portal [Internet] 2021 [Internet]. [cited 2021 Feb 4]. Available from: <https://www.cowin.gov.in/>
6. Weintraub RL, Subramanian L, Karlage A, Ahmad I, Rosenberg J. COVID-19 vaccine to vaccination: Why leaders must invest in delivery strategies now. *Health aff. (Pr Hope)*. 2021;40(1):33-41. [Google Scholar]
7. Murphy, Vallieres F, Bentall RP, Shevlin M, McBride O, Hartman TK, McKay R, Bennett K, Mason L, Gibson-Miller J, Levita L. Psychological characteristics associated with COVID-19 vaccine hesitancy and resistance in Ireland and the United Kingdom. *Nat Commun*. 2021;12(1):1-15. [PubMed] [Google Scholar]
8. Williams L, Flowers P, Mcleod J, Young D, Rollins L, Catalyst Team. Social patterning and stability of intention to accept a COVID-19 vaccine in Scotland: Will those most at risk accept a vaccine? 2021 Jan 4;9(1):17. [PubMed] [Google Scholar]
9. World Health Organization Regional Office for Europe. Vaccination and trust [Internet]. World Health Organization Regional office for Europe. 2017. p. 35 [cited 2021 Dec 27]. Available from: <http://www.euro.who.int/en/health-topics/disease-prevention/vaccines-and-immunization/publications/2017/vaccination-and-trust-2017>