

Original Research Article

A cross sectional study on vaccination coverage of COVID-19 in rural slums of field practice area of a medical college in Hyderabad

Nadia Mouzzam Hussain*, Rajesh Neeluri, Sultan Rizwan Ahmad

Department of Community Medicine, Deccan College of Medical Sciences, Hyderabad, Telangana, India

Received: 25 April 2024

Accepted: 18 May 2024

*Correspondence:

Dr. Nadia Mouzzam Hussain,

E-mail: nadiamouzzamhussain123@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: The COVID-19, a global pandemic, first identified in the Hubei province (Wuhan), China in December, 2019 is caused by SARS-CoV-2. Attempts of containing it there failed, causing it to spread to other regions of Asia and eventually around the whole world in 2020. To control the risk of transmission, non-pharmaceutical interventions were taken up by the governments all over the world. Subsequently, vaccines were developed which were administered. Vaccine hesitancy has become a significant barrier in various countries due to expeditious pace of vaccine development. Hence, this study was conducted to estimate the COVID-19 vaccination coverage in rural slums of field practice area of a medical college in Hyderabad.

Methods: A community based cross sectional study was conducted between January 2023 to March 2023 in field practice area of RHTC of a medical college in Hyderabad. Data was collected from 400 eligible participants, who were selected by simple random sampling, using a predesigned, pretested structured questionnaire. Data was entered in Microsoft Excel and analysed using SPSS Version 20. Chi square test was applied.

Results: In the present study, 60% of the study participants had taken COVID vaccine. Vaccination coverage was high i.e., 65.35% among 18-28 years of age group, 82.2% in females, 62.66% in Muslims, 85.71% in graduates, 80.90% in semi-skilled workers and 77.77% in upper middle socioeconomic class.

Conclusions: The COVID-19 vaccination coverage was low in rural slums. Age, gender, religion, education, occupation and socioeconomic status are important determinants of COVID-19 vaccination.

Keywords: COVID-19, Vaccination coverage, Rural slums

INTRODUCTION

The novel corona virus disease-2019 (COVID-19), a global pandemic, first identified in the Hubei province Wuhan, China in December 2019 is caused by Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). Attempts of containing it there failed, causing it to spread to other regions of Asia and eventually around the whole world in 2020. The World Health Organization declared the outbreak as a public health emergency of international concern (PHEIC) on January 30 2020, and as a pandemic later on March 11 2020. The first case of COVID-19 was reported on January 27 2020.¹

Lockdowns were enforced by several nations to contain the spread of coronavirus disease as the scale of transmissions, infections and deaths overwhelmed the healthcare systems. In the absence of vaccines, non-pharmaceutical interventions (NPIs) such as wearing face masks, maintaining physical distance of 6-feet, compulsory quarantines, imposing travel restrictions and lockdown were the strategy taken up by the governments around the globe to lower the risk of transmission. These were able to slow down the spread of coronavirus disease somewhat, but at a huge economic cost. The COVID-19 pandemic has had a devastating impact on many aspects of human existence, causing unprecedented hardships and

financial stress on the health care system and the economy, prompting a race to develop and administer vaccines to control the virus's spread.

Several nations including the UK, USA, India, Russia and China had started to develop vaccines by March 2021. India is one among the few countries to develop its own native COVID-19 vaccines-Covishield developed by the Serum Institute of India, Pune, the Indian variant of AstraZeneca-Oxford vaccine and Covaxin developed by Bharat Biotech, Hyderabad, India. India launched its COVID-19 vaccination drive on January 16, 2021, with a planned strategy that prioritized frontline workers, healthcare professionals, and the elderly during the first phase of the drive. Subsequently, the vaccination was allowed for all other categories and age groups in a phased manner.

With a total population of over 1.4 billion people, India implemented its largest vaccination drive in the world, which has been a monumental undertaking. Herd immunity has been the key to mitigating the disruptions caused by the pandemic. It is likely to be best achieved by mass vaccination rather than by widespread natural infection. With an adult population of over 940 million, India made remarkable progress by achieving 92.62% first dose coverage and 85.82% full vaccination coverage, administering 2.2 billion doses of total COVID-19 vaccines to over 940 million individuals (as of 17 August 2023).²

However, India has been struggling with demand-side barriers such as vaccine hesitancy and widespread misinformation surrounding the COVID-19 vaccines. Hesitancy towards the newly developed COVID-19 vaccines is a global phenomenon. Available research suggests that vaccine hesitancy varies significantly across the countries: United States (21%), United Kingdom (25%), Russia (45%), Poland (44%), France (41%), Kuwait (76%) and Jordan (71%).³

In India, vaccine hesitancy was disregarded in the hope that as the vaccine supply rises, it would disappear. Based on the reported statistics, vaccine hesitancy is rampant in remote areas and regions with restricted connectivity, where vaccination teams were unable to obtain 100% vaccination coverage after several visits, even when vaccine doses were available.⁴ Hence, this study was conducted to estimate the COVID-19 vaccination coverage in rural slums of Hyderabad; to assess the factors responsible for COVID-19 vaccination coverage and vaccine hesitancy among the study population; to study the AEFI pattern following COVID-19 vaccination in the study population.

METHODS

A community based cross-sectional study was conducted in the rural slums of field practice area of a medical college in Hyderabad, Telangana for three months

between January 2023 to March 2023. The study population comprised of adults aged 18 years and above, residing in the study area for more than 1 year and willing to participate in the study. Pregnant and lactating mothers were excluded from the study. The sample size was calculated using the formula $4pq/d^2$, where prevalence (p) = 27.6% and absolute precision (d) = 5%.⁵ The calculated sample size was 319 which was rounded off to 400 participants.

The sampling method used for selection of study units was simple random sampling by using a random number table. The list of individuals residing in the study area was obtained from the family folders maintained at RHC. All the eligible participants were enlisted and selected by using a random number table till the sample size was achieved. The eligible study participants were interviewed face to face using a predesigned, pretested, structured questionnaire to collect data. Questionnaire consisted of details on socio-demographic, vaccination status, adverse events following COVID-19 vaccination, history of COVID-19 infection, reasons for not getting vaccinated/ vaccine hesitancy and about any existing comorbidities.

Data was collected from 400 participants, fulfilling inclusion criteria. Prior to data collection, informed written consent was obtained from the participants after explaining the purpose of the study. All the information collected was kept confidential. Data was entered in Microsoft Excel and analysed using SPSS version 20. Categorical data will be summarised as percentages. Chi square test was applied to determine statistical association between dependent and independent variables. A probability value (p value) of less than 0.05 will be considered as statistically significant.

RESULTS

The present study was conducted among 400 study participants. The socio-demographic details of the study participants are as given in Table 1. In the present study, the study population was high among the age group of 18-28 years (38%), females (52%), Muslim (94%), those studied till secondary school (42%), unemployed workers (57%), and those belonging to upper lower socio-economic class (class 4) (72%) (Table 1).

60% (240 out of 400) of the study participants had taken COVID-19 vaccine. Out of which fully vaccinated are 192 (80%) and partially vaccinated are 48 (20%) (Figure 1). Majority of the study participants had taken vaccine at Government health centre.

In the present study, vaccination coverage was high among 18-28 years age group (65.35%), females (82.2%), Muslim (62.66%), Graduates/post graduates (85.71%), semi-skilled workers (80.90%), lower middle socio-economic class (77.77%). This difference was statistically significant (Table 2).

Table 1: Socio-demographic details (n=400).

Variable	N	%
Age (in years)		
18-28	153	38
29-38	91	23
39-48	65	16
49-58	53	13
59-68	31	8
>68	7	2
Gender		
Male	191	48
Female	209	52
Religio		
Muslim	375	94
Hindu	25	6
Education		
Illiterate	45	11
Primary	27	7
Secondary	166	42
Intermediate	148	37
Graduate/ post graduate	14	4
Occupation		
Unemployed	226	57
Unskilled	64	16
Semi-skilled	110	28
Socio- economic status		
Class 3	45	11
Class 4	289	72
Class 5	66	17

Table 2: Factors associated with vaccination coverage (n=400).

Variables	Vaccinated (%)	Not vaccinated (%)	Total	P value
Age (in years)				
18-28	100 (65.35)	53 (34.64)	153	0.001 $X^2=15.5$ DF=5
29-38	58 (63.73)	33 (36.26)	91	
39-48	40 (61.53)	25 (38.46)	65	
49-58	30 (56.60)	23 (43.39)	53	
59-68	10 (32.25)	21 (67.74)	31	
>68	2 (28.57)	5 (71.42)	7	
Gender				0.0012
Male	68 (35.6)	123 (64.3%)	191	$X^2=90.66$ DF=1
Female	172 (82.2)	37 (17.7%)	209	
Religion				0.002
Muslim	235 (62.66)	140 (37.33)	375	$X^2=17.77$ DF=1
Hindu	5 (20)	20 (80)	25	
Education				
Illiterate	29 (64.44)	16 (35.55)	45	0.02* $X^2=11.3$ DF=4
Primary	11 (40.74)	16 (59.25)	27	
Secondary	92 (55.42)	74 (44.57)	166	
Intermediate	96 (64.86)	52 (35.13)	148	
Graduate/ post graduate	12 (85.71)	2 (14.28)	14	
Occupation				0.00001
Unemployed	100 (44.24)	126 (55.75)	226	$X^2=53.73$ DF=2
Unskilled	51 (79.68)	13 (20.31)	64	

Continued.

Variables	Vaccinated (%)	Not vaccinated (%)	Total	P value
Semi-skilled	89 (80.90)	21 (19.09)	110	
Socio- economic status				0.001 X ² =18.05 DF=2
Class 3 (lower middle)	35 (77.77)	10 (22.22)	45	
Class 4 (upper lower)	179 (61.93)	110 (38.06)	289	
Class 5 (lower)	26 (39.39)	40 (60.60)	66	
Co-morbidities				0.005 X ² =12.82 DF=3
Hypertension	46 (67.64)	22 (32.35)	68	
Diabetes	28 (65.11)	15 (34.88)	43	
Thyroid disorders	7 (28)	18 (72)	25	
No co- morbidities	177 (60.40)	116 (39.59)	293	

*Statistically significant.

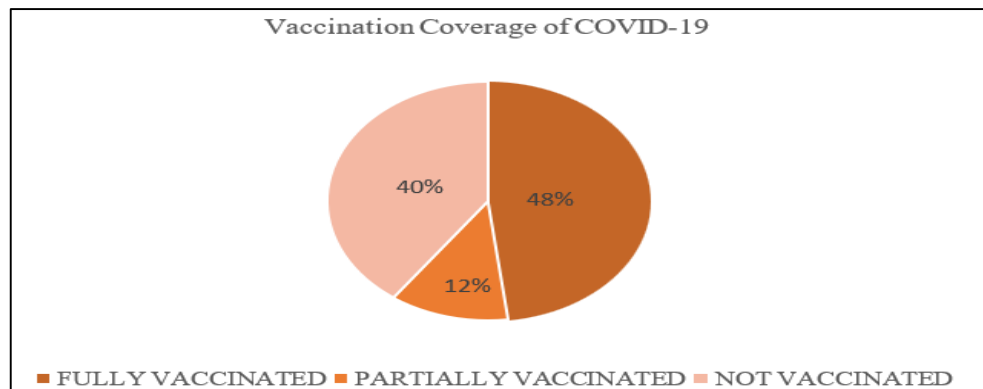


Figure 1: COVID-19 vaccination coverage (n=400).

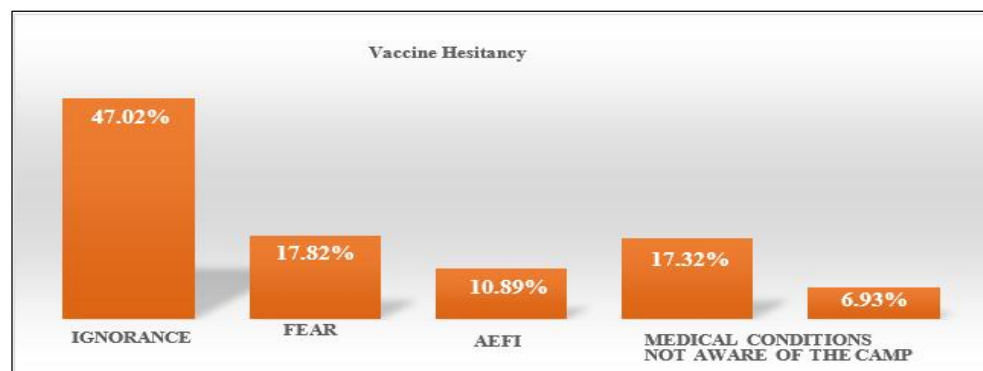


Figure 2: Reasons for vaccine hesitancy (n=202).

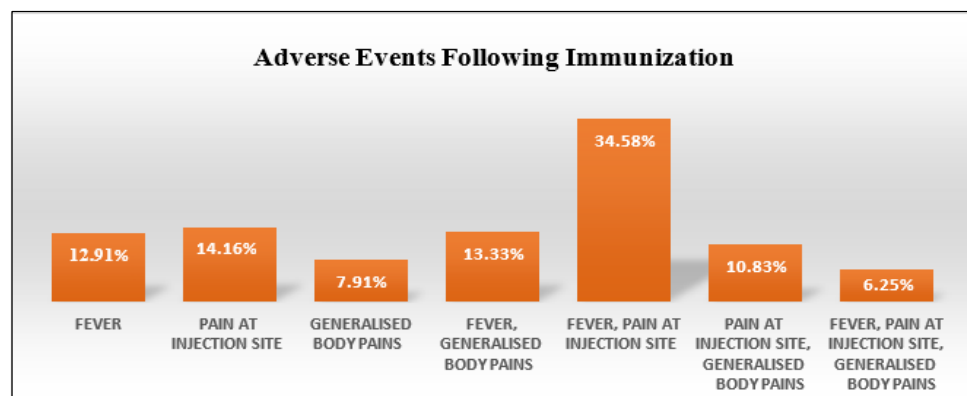


Figure 3: Adverse events following COVID-19 vaccination (n=240).

The reasons reported in the study population for vaccine hesitancy are ignorance (47.02%), fear (17.82%), pre-existing medical conditions (17.32%), due to adverse events following immunization in the first dose (10.89%), not aware of the camp (6.93%) (Figure 2).

AEFIs were reported in majority of the vaccinated study participants. Fever along with pain at injection site was reported in about 34.58% of the vaccinated study participants. The least reported AEFI was fever along with pain at injection site and generalized body pains (Figure 3).

DISCUSSION

In the present study, 60% (240 out of 400) of the study participants had taken the COVID-19 vaccine, 48% (192 out of 400) were fully vaccinated and 12% (48 out of 400) were partially vaccinated. According to research by Dhalaria et al vaccination coverage in Telangana was 78% among eligible people were fully vaccinated and 100% of the eligible population had received at least one dose of COVID-19 vaccine.⁶ As the study participants belong to socioeconomically disadvantaged groups and also having inadequate knowledge regarding COVID-19, could have possibly contributed to their negative attitude towards unwillingness to get vaccinated. Another important aspect that may have hindered accessibility to vaccine is financial distress. Since most of the research participants are employed on a daily basis, they have real concerns about losing a day's pay.

In the present research, vaccination coverage was high among the age group of 18 to 28 years (65.35%), females (82.2%), Muslims (62.66%), graduates and post-graduates (85.71%), semi- skilled workers (80.90%), and lower middle socioeconomic class (77.77%). This difference was found to be statistically significant. This shows a strong association between vaccination and each socio-demographic factor. Similar results were observed in studies conducted in Bangalore by Sunil et al and in New Delhi by Joshi et al.^{7,8}

This study reported that 50.5% of the study participants were hesitant about getting vaccinated or taking the second dose of vaccine. Reasons reported for vaccine hesitancy in this study were ignorance (47.02%), fear (17.82%), pre-existing medical conditions (17.32%), AEFIs following first dose (10.89%), and not aware of the camp (6.93%). In research done by Umakanthan et al in Madurai, vaccine hesitancy was reported in 28.7% of the participants and in Chandani et al 27% of the participants had vaccine hesitancy.^{9,10} The respondents' lack of education, poor socioeconomic status, and unemployment were the primary reasons for their reluctance to get vaccinated. Fear of negative health effects after vaccination was another factor in people refusing the COVID-19 vaccine altogether or in dropouts from getting the second dose. In the present study, majority (55.41%) of the vaccinated study participants

reported adverse effects following vaccination. In approximately 34.58% of reported AEFI cases, fever and pain at the injection site were the most frequently reported symptoms. Similar findings were observed in previous research conducted by Sunil et al Basavaraja et al and Shukla et al where the main adverse events were found to be fever and pain at the injection site.^{7,11,12}

CONCLUSION

The vaccination coverage was low in rural slums when compared to the national and state level data. This research makes a compelling case for correlations between COVID-19 vaccination coverage and socioeconomic status, literacy, poverty, and other factors. The adoption of the COVID-19 vaccine is hampered by vaccine hesitancy. Considering the size of India's population, even a small percentage of hesitant individuals would translate to millions of unvaccinated individuals. The majority of the vaccinated study participants reported AEFIs. All of the reported AEFIs were of minor type, and none of them were of severe or serious type. Almost all AEFIs are not vaccine-specific immunogenic reactions, rather they are similar to the vaccinations brought about by any other vaccinations. The most effective interventions will likely combine several cohesive, multi-component strategies to increase vaccination, awareness, and understanding with changes in attitudes toward vaccination. Since there is currently no specific treatment available for this deadly disease, which keeps coming back with new variants, we should make an endeavor to raise public awareness about this fact and promote vaccination.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. World Health Organization. Coronavirus disease (COVID-19) pandemic. Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>. Accessed on 1 April 2024.
2. Ministry of Health and Family Welfare. Government of India. COVID-19 vaccination update. Available at: <https://www.mohfw.gov.in>. Accessed on 1 April 2024.
3. Sallam M. COVID-19 vaccine hesitancy worldwide: a concise systematic review of vaccine acceptance rates. *Vaccines*. 2021;9(2):160.
4. Rural health. Fact sheet: COVID-19 Vaccination in Rural Areas-Rural Health Information Hub. Available at: <https://www.ruralhealthinfo.org/topics/covid-19/vaccination>. Accessed on 1 April 2024.
5. Masthi NRR, Brahmajosyula A, Khamar A, Acharya N, Bilichod PL, Kondath D. Coverage of coronavirus disease-2019 (COVID-2019) booster

- dose (precautionary) in the adult population: an online survey. *Cureus*. 2022;14(7):26912.
6. Dhalaria P, Arora H, Singh AK, Mathur M, SAK. COVID-19 vaccine hesitancy and vaccination coverage in india: an exploratory analysis. *Vaccines*. 2022;10:739.
 7. Kumar SDR, Srividya J, Patel AE, Vidya R. Covid-19 vaccination coverage and breakthrough infections in urban slums of Bengaluru, India: A Cross sectional study. *BMJ*. 2021.
 8. Joshi A, Kaur M, Kaur R, Grover A, Nash D, El-Mohandes A. Predictors of COVID-19 vaccine acceptance, intention, and hesitancy: a scoping review. *Front Public Health*. 2021;9:698111.
 9. Umakanthan S, Patil S, Subramaniam N, Sharma R. COVID-19 vaccine hesitancy and resistance in india explored through a population-based longitudinal survey. *Vaccines (Basel)*. 2021;9(10):1064.
 10. Chandani S, Jani D, Sahu PK, Kataria U. COVID-19 vaccination hesitancy in India: State of the nation and priorities for research. *Brain Behav Immun Health*. 2021;18:100375.
 11. Basavaraja CK, Sebastian J, Ravi MD, John SB. Adverse events following COVID- 19 vaccination: first 90 days of experience from a tertiary care teaching hospital in South India. *Therapeut Adv Vacc Immunol*. 2021;9:1-12.
 12. Shukla V, Sachan B, Jauhari S, Bhardwaj S, Pathak A, Kandpal SD. Adverse events following COVID-19 Immunisation (AEFI) at a COVID-19 vaccination centre: An observational analytical study. *J Family Med Prim Care*. 2023;12:460-5.

Cite this article as: Hussain NM, Neeluri R, Ahmad SR. A cross sectional study on vaccination coverage of COVID-19 in rural slums of field practice area of a medical college in Hyderabad. *Int J Community Med Public Health* 2024;11:2389-94.