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EVALUATION OF COVID-19 VACCINE COVERAGE AMONG POPULATION ABOVE 18 YEARS IN TUMKUR TALUK, KARNATAKA

Community Medicine

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ABSTRACT

Background: The COVID-19 vaccination in India began on January 16, 2021, and for adolescents a year later. Government data is the only source of coverage, but there is a lack of external studies on coverage. This study aims to assess vaccination coverage among adults over 18 years and identify factors contributing to vaccine hesitancy. **Methods:** A coverage evaluation survey was done for assessing COVID-19 vaccination coverage among adults aged above 18 years by using Cluster sampling Method from August to October 2022 in Tumkur taluk. **Results:** Out of the 292 study subjects, 276 (94.52%) were first dose vaccinated, 256 (87.67%) were second dose vaccinated, 240 (82.19%) were third dose vaccinated and 16 (5.48%) were unimmunized. It was observed that the coverage of COVID-19 vaccine in the age group above 18 years first dose vaccinated coverage was higher compared to second and third dose vaccination coverage. **Discussion:** The COVID 19 vaccine coverage with two doses among above 18 years age group was 94.52% and 87.67% among 292 study subjects. The most common reasons for not being vaccinated were that the subject was not eligible for vaccination during the public vaccination campaign and severe health issues.

KEYWORDS

COVID-19, Vaccine coverage, Dropout rate, unimmunized

INTRODUCTION

The COVID-19 pandemic has swept across the globe, posing a significant threat to public health, with far-reaching social and economic implications. India started to vaccinate its people from 16th January 2021, and later emerged as the world's largest vaccination drive.[1,2] Adequate uptake of the COVID-19 vaccine ensures protection for the vaccinated population and has the potential to stop the pandemic by generating herd immunity, thereby protecting everyone. In the first phase, vaccines were administered to the frontline and healthcare workers, followed by the elderly, people with co-morbidities, and then people aged 18 years and above.[3] Achieving high vaccine coverage rates is essential for achieving herd immunity and preventing further outbreaks. In India, the fight against the pandemic is characterized by a diverse population, varying healthcare infrastructures, and urban-rural divides[4]. The deployment of COVID-19 vaccines has been a beacon of hope, but understanding vaccine coverage dynamics and addressing disparities is crucial, especially in rural areas with limited healthcare resources. According to the existing research, there are significant regional, socioeconomic, ideological, gender, class, and rural-urban differences in COVID-19 vaccination hesitation.[5] Digital tools, the internet and smartphones aid in raising awareness and improving access to vaccines. Yet it also presents problems, primarily false information, anti-vaccine sentiments, fake news, and insufficient knowledge about vaccines.[6] Research indicates that false narratives promote undesirable behavior, such as vaccine reluctance, and have a detrimental impact on health outcome.[1,7] The only source of COVID-19 vaccination coverage is government data. There is a dearth of external studies on COVID-19 vaccine coverage and covariates such as vaccine hesitancy, geography, education attainment, and socioeconomic status. In this regard, the present study was taken up with the objectives to assess the vaccination coverage of COVID-19 among aged above 18 years.

METHODS

The WHO's standard EPI 30 cluster evaluation survey methodology was used for assessing COVID 19 vaccination among adults aged above 18 years during from August to October 2022 in Tumkur taluk. We adopted two stage cluster sampling design for selecting the study population.[4] Sampling frame for selecting study was the complete list of 193 villages and 1 town with their total population and number of houses according to the district census data 2011. Villages with less than 100 houses were linked with the next neighbour village. Cumulative population proportion was calculated according to the same order.

In the first stage, 30 clusters were selected using probability proportional to the population. Sampling interval was calculated by dividing the total population of the district by the In cluster required. A computer generated random number between number one and the sampling interval. The village, which had the selected random number in the cumulative population, was the first selected cluster. Subsequent clusters were selected by adding the sampling interval to the previous cluster population and the village with that number in the cumulative population. This procedure was continued until we got required 30 samples. The maps containing house number of the 30 clusters was collected from the district, These maps were validated with the updated list of number houses in the villages.

In the second stage, households were selected, by simple random sampling using computer generated random number after listing all the households in the selected cluster. The selected households were visited and available persons were enquired in the house. The study subject who fulfilled the inclusion and exclusion criteria were interviewed using a pretested, semi-structured questionnaire having questions on the demographic profile, COVID 19 vaccine, reasons for not taking the vaccine and history of previous COVID 19 infection. Confirmation of vaccination coverage was done by asking for the COVID 19 vaccination certificate issued by the government authorities through Co-WIN portal. If selected house had no Eligible study subject in the age group then next house was visited according to pre-selected house number. This was continued until data of required from 8 study subjects was completed.

The data was entered in google forms and analysis was carried out using IBM SPSS (SPSS Statistics for Windows, Version 26.0. Armonk, NY:IBM Corp). The results were expressed in terms of Descriptive statistics like frequency and percentages. Inferential statistics like z test was used to find the association between the variables, $p<0.05$ was said to be statistically significant. Informed consent was obtained from each subject and confidentiality of the data was maintained at all times.

RESULTS

A total of 292 subjects were included in the study. Among them 158 were from the age group of 18 – 60 years and 118 from above 60 years.

Among the study subjects, 43.84% were female and 53.08% were male. First dose of covid-19 vaccine was received by 276 (94.52%) study subjects, 252 (86.30%) completed second dose, 240 (82.19%) were third dose completed and 16 (5.48%) were unvaccinated in the study. The present study showed that, of the total 292 study subjects, 240 (82.19%) at 95% CI (75.4%-89.7%) were fully vaccinated and 16 (5.48%) at 95% CI (4.1%-7.6%) were not vaccinated for COVID 19. Among fully vaccinated subjects (n=240); 143 (59.6%) were male and 97 (40.4%) were female; and among those who did not get vaccinated (N=16), 7 (43.8%) were male and 9 (56.2%) female (Table 1). It was observed that the coverage of COVID 19 vaccine in the age group of 18 to 60 years was higher compared to 60 years and above and was found to be statistically significant (p=0.002). This study shows that COVID 19 vaccination among Health Care Workers was more than Frontline Workers and others. The study observed that, 18 (6.16%) of them had a history of COVID 19 infection before the vaccination and three had after the first dose vaccination.

Table 1: Demographic profile of vaccination coverage among above 18 years (n=292)

Demographic status	First dose (n=276)	Second dose (n=256)	Third dose (n=240)	Unvaccinated (n=16)
Gender				
Male	155(53.08)	146(57.03)	143(59.58)	7(43.75)
Female	121(43.84)	110(42.96)	97(40.42.)	9(56.25)
Religion				
Hindu	153(55.43)	140(54.68)	128(46.38)	7(2.53)
Muslim	39(14.13)	38(14.84)	35(12.68)	5(1.81)
Others	84(30.44)	78(30.46)	77(27.90)	4(1.44)
Age group(yrs)				
18 - 60	158(57.25)	144(56.25)	132(47.83)	10(3.62)
Above 60	118(42.75)	112(43.75)	108(39.13)	6(2.17)
Occupation				
HCW	38(13.77)	38(14.84)	38(15.83)	0(0.00)
FLW	19(6.88)	18(7.03)	18(7.5)	1(0.36)
Others	219(79.35)	200(78.13)	184(76.6)	15(5.43)

The most common local adverse events were pain and swelling at the injection site and the systemic adverse events included fever, malaise, headache and body ache. All the adverse events subsided spontaneously and completely, without any complications. Following both doses, the only tablet taken was tab. paracetamol 500 mg. Among the 276 (94.52%) subjects who had received 1st dose vaccination, 81 (29.35%) had mild adverse events of which 55(19.93%) were in the age group 18 to 60 years. Among 252 subjects who had received second dose, 22 (7.97%) subjects had mild adverse events. Most common reasons for partial vaccinated or not vaccinated was Afraid of side effects, Spread of rumors through social media, Scare of vaccine administration, Existing co-morbidities, migration, Had recent exposure to COVID-19 through close contacts (Table:2).

Table 2: Demographic distribution of dropout rates from first dose to second dose and second dose to third dose

Demographic status	First dose to second dose	Dropout rates	Second dose to third dose	Dropout rates
Gender				
Male	53.08 -52.90	0.18	52.90 - 51.81	1.09
Female	43.84 - 39.86	3.98	39.86 - 35.14	4.72
Religion				
Hindu	55.43 - 50.72	4.71	50.72 - 46.38	4.34
Muslim	14.13 - 13.77	0.36	13.77 - 12.33	1.44
Others	30.44 - 28.26	2.18	28.26 - 28.13	0.13
Age group(yrs)				
18 - 60	57.25 - 52.17	5.08	52.17 - 47.83	4.34
Above 60	42.75 - 40.58	2.17	40.58 - 39.13	1.45
Occupation				
HCW	13.77 - 13.77	0	13.77 - 13.77	0
FLW	6.88 - 6.52	0.36	6.52 - 6.52	0
Others	79.35 - 66.30	13.05	66.30 - 59.78	6.52

Table 3: Reasons for partial vaccination/ not vaccinated.

Variables	Frequency (%)
Reasons for partial Vaccination	(N=252)
Not due for vaccination	18 (6.16)
Scared after the First dose	05 (1.71)
One Dose is sufficient according to Subject	02 (0.68)
Reasons for not vaccinated	(N=16)
Not eligible for vaccination during Campaign and migration	4 (25.0)
Afraid of side effects	3 (18.75)
Existing co-morbidities	2 (12.5)
Had recent exposure to COVID-19 through close contacts	1 (6.25)
Spread of rumors through social media	4 (25.0)
Scare of vaccine administration	2 (12.5)

DISCUSSION

The pandemic has posed significant challenges for the public health system, and India's approach to managing it is people-centric, involving the entire government and society. Key interventions include actions at points of entry, nationwide lockdown, and focus on test, track, isolate, and treat. These measures not only slowed down the pandemic but also allowed time for the country to build public health capacities to effectively manage the pandemic. To minimize the public health threat of the COVID-19 pandemic in India, a significant proportion of the population needs to be vaccinated.[8]

In the present study (Table 1) the coverage of COVID 19 vaccine in the age group of 18 to 60 years was higher compared to 60 years and above which was statistically significant. Mortality due to COVID-19 was significantly higher among the elderly age group due to multiple co-morbidities. Presence of co-morbidities and fear of adverse reactions were the major reasons among them for low coverage.[9]

Following the first dose of vaccination, adverse events reported were higher compared to subsequent doses. Most of the adverse reactions had local and systemic presentations but were mild in nature.

COVID-19 vaccination coverage was more in males than female in this study (Table 1).

There were cases of COVID 19 infection before the vaccination and after the partial vaccination. Therefore, spreading awareness about the vaccine is crucial in areas with inadequate healthcare infrastructure and those prone to hesitancy.[10]

Motivating factors for vaccine acceptance include fear of disease, wanting to return normalcy, and trust in doctors, while barriers include fear of death due to vaccine, opacity in vaccine details, anxiety, and misinterpretation of adverse events.

The uptake of healthcare services, including vaccination, is linked to investments in healthcare infrastructure and socioeconomic indicators. States with robust healthcare infrastructure have been better equipped to handle emergencies like COVID-19, while rural areas have underdeveloped infrastructure. The study found a positive correlation between health infrastructure and COVID-19 vaccination coverage, suggesting that states with better health infrastructure are better equipped to handle the crisis effectively and inoculate individuals at a faster rate. However, this observation differs from the current study's findings.

CONCLUSION:

In our study dropout rates was high from second dose to third dose when compared to first dose to second dose. Most common reasons for partially and not vaccinated was severe health issues, fear of adverse reactions, migration and not eligible criteria. It is recommended to build trust among the general public, via the spread of timely and clear messages through trusted channels advocating the safety and efficacy of currently available COVID-19 vaccines.

Limitations:

As the study was conducted in one geographical area, the results may not be generalized to the whole population.
This vaccination program is an ongoing project so the results cannot be taken as final

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