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Original Research Article

A cross sectional survey on COVID-19 vaccination coverage at urban health center of a district in central Gujarat

Margi B. Sheth[1]*, Gopi K. Kalariya[2], Bharti L. Makwana[3], Kalpita S. Shringarpure[3]

[1]Department of Community Medicine, GCS Medical College, Ahmedabad, Gujarat, India
[2]Department of Community Medicine, Dr. M. K. Shah Medical College and Research Centre, Ahmedabad, Gujarat, India
[3]Department of Community Medicine, Medical College Baroda, Gujarat, India

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***Correspondence:**
Dr. Margi B. Sheth,
E-mail: margisheth11@yahoo.in

ABSTRACT

Background: COVID-19 vaccination can lead to herd immunity when a sufficient proportion of population is vaccinated. Effectiveness of vaccination coverage depends on the population's willingness to be vaccinated completely. Aim and objective was to estimate COVID-19 vaccination coverage and to determine reasons for its acceptance and non-acceptance in urban field practice area of medical college attached with tertiary care hospital.
Methods: A cross-sectional house to house survey was conducted among the households (n=1346) under an urban health training centre (UHTC) of a medical college in central Gujarat after the second wave of COVID-19. All the beneficiaries above the age of 18 years residing in the house-holds coming under the field area were included in the study. The data was collected using Epi-collect 5 mobile based applications. Beneficiaries who had taken two doses of COVID-19 vaccine were counted as fully immunized. Vaccination coverage was calculated different for first and second dose. Facilitators and barriers for COVID-19 vaccination were shown with appropriate diagram.
Results: Out of the 1832 participants in the survey, vaccination coverage was 78.22% for first dose and 37.23% for second dose. Most common motivation (81%) behind taking vaccination was "good health". Among the non-users for COVID-19 vaccination, 36.8% did not take the vaccine due to fear of adverse reactions.
Conclusions: Vaccination coverage is average in the urban area surveyed. Majority of the population is motivated to take the vaccine to protect themselves from COVID-19. The main reason for not taking vaccine was fear of side-effect of vaccine.

Keywords: COVID-19, Vaccination coverage, Vaccine hesitancy

INTRODUCTION

COVID 19 infection emerged as unprecedented challenge to health system due to its high infectivity, significant mortality and limited treatment therapies. COVID infection has affected millions of people and causes huge negative impact on world economy. Till 16 October 2022 there were total 44 million cases and 5 lakh deaths reported worldwide.[1]

Herd immunity is necessary for prevention of any infectious disease, and it can be developed by immunization against that particular disease.[2,3] So, is the case for COVID-19.[4,5]

The success of any vaccination programme required high vaccination coverage which depends on people's willingness to get vaccinated.[6] WHO defined vaccine hesitancy as a "delay in acceptance or refusal of vaccination despite the availability of vaccination

services".[7] WHO has declared vaccine hesitancy as one of the global threats to vaccine coverage.[8]

India has been struggling with vaccine hesitancy and misinformation regarding COVID 19 vaccine.[9] Vaccine hesitancy is associated with female gender, younger age, lower education level, lower socioeconomical class, religious belief.[10,11] This study was carried out to identify coverage in the field area and reasons for not taking the vaccine.

Aim and objective(s)

To estimate the vaccination coverage of COVID-19 vaccination in the urban field practice area of Medical College Baroda. To determine the facilitators and barriers for acceptance of COVID-19 vaccination.

METHODS

Study design and study population

A cross sectional survey was conducted in the urban field practice area of Medical College attached with tertiary care hospital during August 2021 to October 2021, having five areas including 1346 total number of household and 5920 population at the time of survey. Population aged 18 years and above were included in the study. Household member present in their respective residence at the time of survey were included in the study and they were also questioned regarding other members of their household regarding their vaccination status. Covid vaccine was available free of cost to population age 18 years and above at the time of study. Vaccines available at that time in Vadodara were Covishield, Covaxin and SputnikV.

Ethical consideration

The study was conducted with due permission from the institutional ethics committee for human research (IECHR) to carry out this study. All the eligible beneficiaries present at the house on the time of survey were included in the study after taking verbal informed consent from the participation. Interviews were taken after assuring confidentiality. The electronic records were secured by password protected files, allowing limited access to the soft copies. The principal investigator was directly responsible for data collection and the data without individual identifiers was shared with the co-investigators for analysis purposes. Records will be maintained for five years after completion of study.

Data collection and analysis

A pre-tested and semi-structured questionnaire in a mobile based application tool Epicollect5 was used to collect data. Study participant were asked about their demographic profile, covid vaccination status, side effects of the vaccination and reason for acceptance or non-acceptance of covid vaccine. For cross verification of covid vaccination status, vaccination certificates were referred. The data was extracted from Epicollect5 into excel sheet and analyzed using Epi-info 7 software. Bivariate analysis was used to analyze the factors influencing COVID-19 vaccine acceptance and reluctance. A p value of less than 0.05 and a confidence interval of 95% was considered statistically significant.

Specific benefits to the patients

Information sheet regarding the study was given prior to the interview regarding information of the study as well as benefits of taking COVID-19 vaccine. After getting information regarding the reasons for acceptance and non-acceptance it will be easy to improve the vaccination coverage in the field area. Health education related activities were done after the survey to improve the coverage of COVID-19 vaccination.

Definitions

Vaccination coverage

Vaccination coverage was defined as proportion of beneficiaries vaccinated by one dose of COVID-19 vaccine.

Fully vaccinated

Fully vaccinated beneficiaries were those who had been vaccinated by two doses of COVID-19 vaccine.

RESULTS

Total number of participants surveyed in the area was 1832 and covid-19 vaccination coverage in the area was 78.22% (1433/1832). Among them 37.23% (682/1832) were fully vaccinated. Among those vaccinated, 91% had taken Covishield and 9% had taken Covaxin. Nearly 99% of participants had taken vaccine from government setup.

Sociodemographic profile according its association with vaccination status is presented in Table 1. There was statistically significant association observed with gender (p value- 0.001), education (p value- 0.01), and occupation (p value- <0.01) of beneficiary with vaccination status of beneficiary.

The reasons for not receiving a second dose among those who had already received their first dose were lack of availability of the vaccine (9.19%) and the assumption that they did not require a second dose (2.93%). The reasons for vaccine acceptance among those who have received it are shown in Figure 1. Majority of them (81%) have received vaccines to protect themselves from COVID-19 infection. Others (12%) were encouraged to get vaccinated by family members.

While majority of the population was motivated to get COVID-19 vaccination, reasons for not taking vaccine

are shown in Figure 2. Vaccine hesitancy was primarily due to fear about adverse effect of vaccine (36.8%), comorbid conditions (24.1%), and effectiveness of vaccines (16.5%).

Table 1: Sociodemographic profile and its association with vaccination status.

Variable	Vaccine taken	Vaccine not taken	P value
Age group (years)			
18-45	882 (79.46%)	228 (20.54%)	0.145
46-60	364 (77.61%)	105 (22.39%)	
>60	187 (73.91%)	66 (26.09%)	
Gender			
Male	768 (81.27%)	177 (18.73%)	0.001
Female	665 (74.97%)	222 (25.03%)	
Education			
Literate	1214 (77.28%)	317 (20.18%)	0.01
Illiterate	219 (72.76%)	82 (27.24%)	
Occupation			
Housewife	475 (71.74%)	188 (28.36%)	<0.01
Employed	707 (83.87%)	135 (16.03%)	
Unemployed	111 (70.25%)	47 (29.74%)	
Students	102 (79. 07%)	27 (20.93%)	
Healthcare workers	38 (95.00%)	2 (5.00%)	
Total	1433	399	

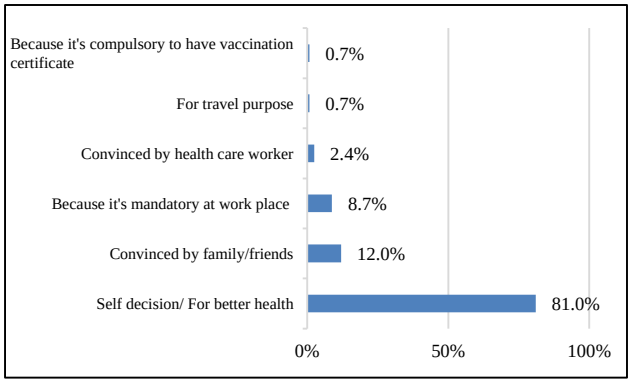

Figure 1: Reasons for taking COVID-19 vaccination among beneficiary (multiple options included).

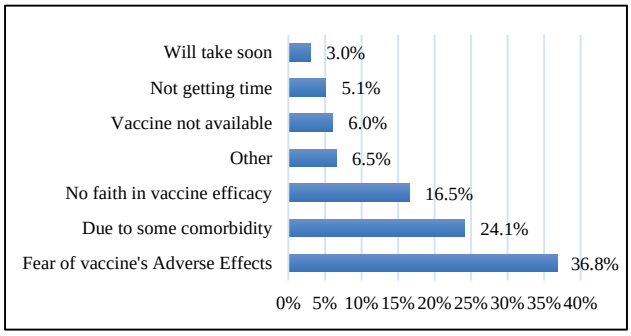

Figure 2: Reasons for not taking vaccination among beneficiary (multiple options included).

DISCUSSION

Vaccine development is necessary for fighting a pandemic of any infectious disease, but their effectiveness depends on vaccine uptake, which may be greatly threatened by vaccine hesitancy.[12,13] Vaccine hesitancy has been identified as one of the top ten major global health threats that may weaken world-wide efforts to control the viral spreading of disease and efforts to reach sufficient immunization, referred to as herd immunity.[14] If people remain vaccine hesitant, herd immunity cannot be accomplished and subsequent pandemic cannot be controlled. This requires social research for identifying reasons for facilitating the vaccine uptake and barrier in taking vaccines.[15,16] This study was done with the objective of estimating the prevalence of COVID-19 vaccination coverage and reason for its acceptance and non-acceptance.

Out of total 1832 participants enrolled in the study; COVID-19 vaccination coverage was 78.22%. In a systemic review done by Dhalaria et al, they found that COVID-19 vaccine acceptance rates in India vary between 53% and 95%.[9] In a study done by Kamal et al in Bangladesh aimed to identify factors affecting COVID-19 vaccination revealed that major factors affecting for vaccination were perceived risk for of being infected, fear of getting impact on daily life, history of comorbidity and recommendation by their respective physician. These reasons support the findings of this study.[17] Evidences are available from various studies that "better health" and "perceived risk for getting infected" were main reasons for taking covid-19 vaccine.[18,19] In this study beneficiaries perceived COVID-19 vaccine as a key stone to prevent covid-19 infection as well as its transmission.

Major reason for vaccine hesitancy to get vaccinated was fear of adverse effects vaccine (36.8%) and presence of some comorbidity (24.1%) followed by no faith in vaccine efficacy (16.5%). There are available findings that fear of adverse event followed by vaccination is one of the reasons for vaccine hesitancy.[20,21] The findings in this study were a systemic review carried out by Smith et al that the safety of vaccines was the most frequently reported reason for vaccine hesitancy.[22] In addition, Smith et al found that belief in lack of susceptibility to an illness seemed more important than belief in lack of belief about severity, a finding also echoed by our review.[22]

Another systemic review by Kumar et al has identified four main themes underpinning the reasons behind vaccine hesitancy in adults in relation to the influenza and COVID-19 vaccines.[23] These are concerns over safety, lack of trust, lack of need for vaccination and cultural reasons.[23]

Gender, level of education, and occupation were found to be important factors for being vaccinated in the study population (p value <0.05). These findings correspond to studies conducted among the general population of

India.[9,10] Gender-based disparity in utilization of the COVID-19 vaccines has been noted. Of the total 1.7 billion doses administered in India, males have received 870 million or 51%, while females have received 820 million doses or 48%. There are strong perceptions across households that since men go out to work, their health must be protected and prioritized over women who mostly engage in domestic work.[14] Reasons for Vaccination discrepancy in gender could be males having greater digital access than females; providing them with an added advantage in timely registration, locating vaccination centres, accessing vaccine certificates, etc.

The same findings were found in multiple surveys conducted by organisations such as IDFC Institute, Mumbai, NCAER, etc., emphasized that females are likely to be more hesitant about COVID-19 vaccines due to the spread of rumours on social media.[15,16,21] Females are more prone to believing in misinformation and rumours regarding vaccines' side effects, infertility, and menstruation. Females are less likely to utilise healthcare services and household resources on health. Structural problems in access to healthcare and gendered-biased household resource allocation to female health have resulted in neglect of female health in India.

It was observed that literacy was inversely proportionate to vaccine hesitancy. Our study findings were supported by the other study findings and possible reason for this could be higher literacy to be associated with better health outcomes as people have knowledge and awareness regarding diseases, morbidity factors, and general health status, including vaccination. vaccination coverage public awareness and positive framing of common side effects of COVID-19 vaccination should be carried out.

Based on the findings of this study, case-based counselling approach can be discovered and tested to look for its effect on improving vaccination coverage.

CONCLUSION

The acceptance rate of COVID-19 vaccine among the study population was high. Majority of the population were motivated to take the vaccine to protect themselves from COVID-19. Most common reasons for not taking vaccines were fear of vaccine's side effects, lack of knowledge regarding vaccination eligibility criteria and benefit of the COVID-19 vaccine

The study was conducted in urban field practice area attached with Medical College, which may impact the generalizability of study finding.

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Ethical approval: The study was approved by the Institutional Ethics Committee for Biomedical and Health Research (IECBHR)-No.IECBHR/157-2022

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