



**FACTORS INFLUENCING IN ACCEPTANCE OF THE COVID-19 VACCINE
AMONG VACCINATED INDIVIDUALS WITH COMORBIDITIES OF
URBAN AREAS OF ANAND DISTRICT, GUJARAT- A DESCRIPTIVE
CROSS SECTIONAL STUDY**

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Received 19th Oct. 2022; Revised 16th Nov. 2022; Accepted 20th March 2023; Available online 1st Nov. 2023

<https://doi.org/10.31032/IJBPAS/2023/12.11.7557>

ABSTRACT

Introduction: Corona virus affects all individuals differently some people may not show any clinical signs but few vulnerable may show signs and symptoms. Corona viruses have affected human being globally. Covid-19 patients who are suffering from COPD, diabetes, hypertension, HIV or cardiovascular diseases are at higher risk of mortality.

Aim: To identify the factors influencing in acceptance of covid-19 vaccine among vaccinated individuals with comorbidities and to find out the association between factors influencing, demographic variables to acceptance of covid-19 vaccine

Materials & Methods: A community based cross-sectional study was performed from 20 April 2022 among 200 individuals who have taken at least a single dose of covid-19 vaccine and those who are diagnosed with comorbidities. The tool used to collect the data consists of demographic variables and close-ended dichotomous questionnaires related to the factors influencing in acceptance of the covid-19 vaccines. Collected data was analysed using descriptive and inferential statistics.

Results: Out of 200 participants 43.5% of the vaccinated individuals with comorbidities had high acceptance of COVID-19 vaccine (score 0-11) P-value corresponding to demographic variable educational qualification was small ($p=0.05$), the demographic variable educational qualification was found to have significant association with acceptance of COVID-19 vaccine among vaccinated individuals with comorbidities of urban areas of Anand district.

Conclusion: In this study researcher stated that the demographic variable educational qualification was found to have significant association with acceptance of covid-19 vaccine among vaccinated individuals with comorbidities.

Keywords: Acceptance; Comorbidity, Covid-19 vaccine, Factors affecting

1. INTRODUCTION

SARS-cov-2 is known as a corona virus is a contagious illness (COVID-19) caused by the novel corona virus [1]. It has a crown-liked structure and belongs to the family of corona viruses which affects the body's respiratory system. The virus strain was first identified in Wuhan, China on December 2019 [2]. As of 29 July 2022 globally 572,239,451 of confirmed cases of covid-19 were seen. In India from January 3 2020 to 7 September 2022 there are 44,472,241 confirmed cases of covid-19 [3]. In Gujarat till 6 September 2022 12.7L people were affected [4] whereas in Anand district of Gujarat 43,979,730 were found till 31st July 2022 [5]. A global data report has suggested that nearly 3 million people have died all over the world which is related to covid-19 disease [6]. Comorbidities increase the risk of developing diseases like diabetes, hypertension, kidney disease, cancer and patients taking steroids have a higher risk of acquiring the covid-19 infection. The

aged, a vulnerable group, are not only more likely to develop a chronic illness than the general population but also die from it [7]. Adults older than 65 account for more than 80% of covid-19 mortality and people older than 45 account for more than 95% of mortality rate [8].

Vaccine hesitation was outlined as a delay in accepting or refusing the vaccine notwithstanding the availability of immunization services by the WHO Strategic Advisory Group of Experts on Immunization. Depending on the particular vaccination or condition, as well as on personal, societal, and environmental variables, the contributing elements are likely to differ. During the Covid-19 epidemic, disinformation and conspiracy theories about vaccines were prevalent on the internet and in social media. Humans tend to pay attention to signs regarding the actions, attitudes, and values that are generally accepted because of our innate social nature [9]. Numerous nations have

conducted studies and it has been shown that there are a number of worries and challenges relating to the covid-19 vaccine. It has also been discovered that the rapid development of the covid-19 vaccine was indeed a big worry for vaccine resistance [10].

A community-based study was conducted to find the factors among post vaccinated adults of the United Kingdom found that people who were vaccinated were less infected with covid-19 as compared to those who were not vaccinated and also asymptomatic [11]. Based on the review of literature the researcher found multiple factors regarding the covid-19 vaccine such as misconceptions of side effects, lack of knowledge about vaccine, anxiety before vaccine intake, forceful vaccination by government, efficacy of the vaccine and many others. In order to explore various factors which were present among the Indian population of Gujarat region's Anand district about the factors affecting in acceptance of the covid-19 vaccine among the vaccinated comorbid individuals.

2. MATERIALS & METHODS

2.1. Study design, setting, and sample

Descriptive Cross-sectional study was conducted during the month of May 2022. Samples were selected through non-probability convenient sampling technique. In this study research setting was the urban

health centre of Anand and Borsad of Anand district, Gujarat, India. Individuals those who belong to the age group of 45years and above those who have taken at least single dose of covid-19 vaccine, who were diagnosed with comorbidities including diabetes mellitus, hypertension, coronary artery disease and others also who were physically available and those who can read and write Gujarati and English language were included in this study. By taking the sample proportion to be 0.142 (14.2%) and the power of 95% the sample derived were 174 and after attributing 10% to it, 200 participants were selected in this study.

2.2. Study procedure

Self structured closed-ended dichotomous questionnaires were formed. Participants were given informed consent forms after explaining the purpose of the research study then they were asked to fill the data collection tool which included two sections. Section-I was based on the background data of the participants including the demographic data and Section-II had 35 questionnaires related to the factors influencing in acceptance of the covid 19 vaccines. The questionnaires are categorized under various factors such as vaccine registration & technological factors, physical factors, factors related to comorbidities, vaccine availability factors, psychological factors, knowledge and

awareness factors, social, cultural & religious factors and personal factors.

2.3. Data analysis

Collected data was analyzed using descriptive and. Analysis of socio demographic variables and questionnaires was done by thematic analysis, determining the codes and coding by the process of verbatim and dialect analysis of the data. Interpretation of the data was done in the form of graphs and tables form. Responses to the factors influencing in the acceptance of covid-19 vaccine were categorized into “Yes and No”. Uniform distribution scoring was done to find out the acceptance of covid-19 vaccine then Chi square test was done to determine the factors influencing in the acceptance of covid-19 vaccine and logistic regression was done through the fisher exact test for association between demographic variables to acceptance of covid-19 vaccine.

2.4. Ethical considerations

Ethical considerations was approved by the Institutional research Ethical Committee of CHARUSAT University (IEC-CHARUSAT). Written consent of participants was a mandatory process. The participants were informed that their participation was voluntary, had the freedom to withdraw from the study .No ethical issue was confronted while conducting the study.

3. RESULT

Out of 200 participants 66 (33.0%) belonged to the age group of 45-55 years, out of them majority were male 109 (54.5%), 101 (50.5%) had qualification of Graduation or above, 72(36.0%) were Homemakers, 170 (85.0) belonged to Hindu religion, 138 (69.0%) had Hypertension and the 74 (37.0%) of individuals had comorbidities since past 2-3years (**Table 1**).

Out of 200 samples 43.5% of the vaccinated individuals with comorbidities had high acceptance of COVID-19 vaccine (score 0-11) and 56.5% of them had moderate acceptance of COVID-19 vaccine (Score 12-23). The above scoring is done based on the equal or uniform distribution in which all the outcomes are equally likely. The scoring is categorized based on the response of the participants which is Yes=1 and No=0 for a particular response. The sum total of each response of participant is done and recorded under scoring category where high score is from 0-11, moderate score 12-23 and low score is from 24-35 (**Table 2**).

Out of 200 participants 69(34.5%) faced problems regarding the vaccine registration & technological factors, 134 (67.0%) had physical factors related problems where they had to skip their meal because of prolonged standing in the queue for taking the covid-19 vaccine, 122 (61.0%) had issues related to comorbidities where they

have taken the covid-19 vaccine because their healthcare provider or doctor has advised to take so, 168(84.0%) faced challenges regarding the vaccine availability factors in which the participants got delayed in taking vaccine due to vaccine unavailability, 79 (39.5%) faced psychological stress before undertaking covid-19 vaccine, 153 (76.5%) had challenges regarding knowledge and awareness factors as they had heard/read in the media made them reconsider the choice to get vaccinated. 126 (63.0%) had faced social, cultural & religious factors where

cultural practices had prohibiting them from taking the covid-19 vaccine, 60(30.0%) faced personal factors where someone they knew ever had a bad reaction to a vaccine which made them to reconsider getting covid-19 vaccine (**Table 3**).

The p-value corresponding to demographic variable educational qualification was small (less than 0.05), the demographic variable educational qualification was found to have significant association with acceptance of COVID-19 vaccine among vaccinated individuals with comorbidities of urban areas of Anand district (**Table 4**).

Table 1: Demographic characteristics among vaccinated individuals with comorbidities of urban areas of Anand district (N=200)

Demographic variable	Frequency	%
Age		
45-55 years	66	33.0%
56-65 years	56	28.0%
66-75 years	53	26.5%
>75 years	25	12.5%
Gender		
Male	109	54.5%
Female	91	45.5%
Transgender	0	0.0%
Educational status		
No formal education	6	3.0%
Primary education	43	21.5%
Secondary education	18	9.0%
Higher secondary education	32	16.0%
Graduation or above	101	50.5%
Occupation		
Homemaker	72	36.0%
Private Employee	12	6.0%
Government Employee	18	9.0%
Self-employee	78	39.0%
Others	20	10.0%
Religion		
Hindu	170	85.0%
Muslim	25	12.5%
Christian	5	2.5%
Other	0	0.0%
Comorbidities		
Diabetes mellitus	119	59.5%
Hypertension	138	69.0%
Coronary artery disease	44	22.0%
Other	10	5.0%
Duration of comorbidity		
<1year	11	5.5%
2-3years	74	37.0%
4-5years	66	33.0%
>5years	49	24.5%

Table 2: Acceptance of covid-19 vaccine among vaccinated individuals of urban areas of Anand district (N=200).

Acceptance of covid-19 vaccine	Frequency	%
High (Score 0-11)	87	43.5%
Moderate (Score 12-23)	113	56.5%
Low (Score 24-35)	0	0.0%

Table 3: Factors influencing in the acceptance of covid-19 vaccine among vaccinated individuals with comorbidities of urban areas of Anand district (N=200).

Factors influencing in acceptance of covid-19 vaccine		Yes		No	
		f	%	f	%
Vaccine registration & Technological factors	During the registration process for vaccination did you face server issues/ site crashing issues?	68	34.0%	132	66.0%
	While registration process for covid-19 vaccination did you face network connectivity issues?	68	34.0%	132	66.0%
	During registration process did you face any problems in registering due to unawareness regarding technology?	69	34.5%	131	65.5%
Physical Factors	Did you face any physical limitation (Distance) to get COVID-19 vaccine?	127	63.5%	73	36.5%
	Did you had to skip your meal because of prolong standing in the queue for taking the covid-19 vaccine?	134	67.0%	66	33.0%
Comorbidities	Because of your comorbidity did your vaccination got delayed in any manner?	108	54.0%	92	46.0%
	Did you have fear because of your comorbidity whether the covid-19 vaccine will be effective as compared to the normal healthy people?	107	53.5%	93	46.5%
	Did you had a belief covid-19 vaccine could have helped to cure your comorbidity?	90	45.0%	110	55.0%
	Have you taken the covid-19 vaccine because your healthcare provider or doctor has advised you to take so?	122	61.0%	78	39.0%
	Did you think that taking the covid-19 vaccine along with your ongoing medications for comorbidities will harm your health in any manner?	107	53.5%	93	46.5%
	While taking the covid-19 vaccine did you feel hesitant that this will worsen your present disease condition?	98	49.0%	102	51.0%
	Did you experienced any stress, increased in blood pressure, sweating or palpitations while standing in the queue for vaccination	93	46.5%	107	53.5%
	Did you belief covid-19 vaccine cannot be taken along with the comorbidity medications?	83	41.5%	117	58.5%
Vaccine Availability Factors	Has the unavailability of the covid-19 vaccine delayed your vaccination?	168	84.0%	32	16.0%
	Did you face any challenges in availability before taking the covid-19 vaccine?	165	82.5%	35	17.5%
	Were you confused between various covid-19 vaccines available in the market before getting vaccinated?	157	78.5%	43	21.5%
Psychological Factors	Did you face any psychological stress before undertaking covid-19 vaccine?	79	39.5%	121	60.5%
	Have you had a perception that taking the covid-19 vaccine is unsafe for your life?	64	32.0%	136	68.0%
	Do you think covid-19 vaccine may have some unforeseen future effects on health?	62	31.0%	138	69.0%
	Do you have beliefs that there were other (better) ways to prevent diseases other than vaccine?	55	27.5%	145	72.5%
	Were you afraid about the safety or side effects while taking the COVID-19 vaccine?	62	31.0%	138	69.0%
	While taking the vaccination did you had a thought that vaccines will not work against COVID-19 disease?	58	29.0%	142	71.0%
	Did you have a fear whether taking the vaccine will get you in contacted from coronavirus?	46	23.0%	154	77.0%
	Did you belief the covid-19 vaccine will give protection for lifelong from coronavirus?	64	32.0%	136	68.0%
Knowledge and awareness factors	Did your awareness and knowledge about covid-19 vaccine made you to take the covid-19 vaccination?	149	74.5%	51	25.5%
	Did any reports you heard/read in the media made	153	76.5%	47	23.5%

	you reconsider the choice to get vaccinated?				
Social, Cultural & Religious factors	Had your cultural practices been prohibiting you from taking the covid-19 vaccine?	126	63.0%	74	37.0%
	Have you taken the covid-19 vaccine because it was a societal responsibility?	112	56.0%	88	44.0%
Personal factors	Did you take the covid-19 vaccination because it was mandatory for everyone?	64	32.0%	136	68.0%
	Would you have taken the COVID- 19 vaccines even if it was not free?	52	26.0%	148	74.0%
	Have any personal events in the past that diminished your trust in covid-19 vaccine before taking the vaccine?	52	26.0%	148	74.0%
	Has your lifestyle (occupation) encouraged you to receive covid-19 vaccine?	53	26.5%	147	73.5%
	Have you or someone you know ever had a bad reaction to a vaccine which made you reconsider getting covid-19 vaccine?	60	30.0%	140	70.0%
	Did your or someone's experiences with pain in the past immunization prevented you from being vaccinated?	41	20.5%	159	79.5%
	Did you have a concern in taking the covid-19 vaccine because it was a new vaccine?	50	25.0%	150	75.0%

Table 4: Fisher's exact test for association between demographic variables to acceptance of covid-19 vaccine (N=200).

Demographic variable		Acceptance		p-value
		High	Moderate	
Age	45-55 years	31	35	0.789
	56-65 years	23	33	
	66-75 years	24	29	
	<76 years	9	16	
Gender	Female	45	46	0.152
	Male	42	67	
Educational qualification	No formal education	5	1	0.035
	Primary education	24	19	
	Secondary education	6	12	
	Higher secondary education	16	16	
	Graduation or above	36	65	
Occupation	Government Employee	7	11	0.986
	Homemaker	33	39	
	Others specify	8	12	
	Private Employee	5	7	
	Self-employee	34	44	
Religion	Hindu	68	102	0.051
	Muslim	16	9	
	Christian	3	2	
Comorbidities	CAD	2	6	0.291
	DM	20	24	
	DM, other	1	0	
	DM, CAD	0	2	
	DM, HTN	20	25	
	DM, HTN,CAD	7	18	
	DM,HTN, other	1	1	
	HTN	30	27	
	HTN,CAD	2	7	
	Other	4	3	
Duration of comorbidity	<1year	4	7	0.789
	>5years	19	30	
	2-3years	35	39	
	4-5years	29	37	

4. DISCUSSIONS

In order to explore various factors which were present among the Indian population of Gujarat region's Anand district about the factors affecting in acceptance of the covid-

19 vaccine among the vaccinated comorbid individuals this study was conducted. 200 participants were involved in this study where several factors were identified among comorbid vaccinated individuals.

Vaccine registration & Technological factors

In this 34.5% participants had faced the issues with technological aspects during covid-19 registration. Also a survey conducted in United States found that 33 % people found it difficult in sign in process, 7% of people had problems with the usage of smart phone and other devices and 18% of participants asked help from other people for registration process due to lack of technological knowledge [12].

Physical Factors

(67.0%) participants had to skip their meal because of prolong standing in the queue for taking the covid-19 vaccine. Similar study conducted stated that 50% of the participants had to wait at the vaccination centres for the vaccine [13].

Comorbidities

61.0% participants had taken the covid-19 vaccine because their healthcare provider or doctor has advised you to take the vaccine also a survey done in China stated that people were willing to take the vaccine if their health care providers suggest them to take the vaccine [14].

Vaccine Availability Factors

84.0% of participants told that the unavailability of the covid-19 vaccine had delayed the vaccination among the participants. A similar study found that about 60.3% of participants had issues regarding the vaccine availability [15].

Psychological Factors

39.5% people faced psychological stress before undertaking covid-19 vaccine. Similarly a study regarding the impact psychological factors and stated that 36% people had faced psychological issues including anxiety among 25% and depression among 41% of participants [16].

Knowledge and awareness factors

76.5% of individuals had heard/read any reports in the media made them to reconsider the choice to get vaccinated. Likewise stated that people who are increasingly being exposed to false information through media outlets were more reluctant to receive the COVID-19 vaccine [17].

Social, Cultural & Religious factors

63.0% of participants had challenges related to cultural practices as it was prohibiting them from taking the covid-19 vaccine. A similar study of Bangladesh found that 18.5% people had religious reasons for hesitancy towards of vaccine [18].

Personal factors

30.0% of participants had someone who they knew ever had a bad reaction to a vaccine which made them to reconsider to take the covid-19 vaccine. Similar study found that there is the presence of the psychological factor including the side effect of vaccine as well as the experience of others in taking of covid-19 vaccine

[19].

This is the first study as per our knowledge which has been conducted to assess the factors influencing in acceptance of covid-19 vaccine among vaccinated individuals with comorbidities in India. There are several limitations of this study such as the study was limited to only 200 participants as the similar study can be performed among greater sample size for better outcome, people who were 45 years of age and above were only included as comorbidities can be seen among below 45 years as well, the sampling technique was used was convenient sampling as there maybe the chance of over or decreased representation of the sample and convenient sampling technique doesn't generalize the results. Also, the study only included who were vaccinated, diagnosed with comorbidities and residing in urban areas of Anand district had led to limited results.

This study has identified certain factors where many challenges were faced by people which has a direct impact on reduced vaccination drive due to unawareness and lack of technical knowledge, issues with server and site crashing while registration, physical limitations in which people had to stand in queue for their turn to get vaccinated even after registration and hence they had to skip their meal and medications especially it is a

challenge for comorbid person. People have taken the vaccine only when their health care providers or doctors has advised to take the vaccine due to beliefs of deterioration in their present health, anxiety before vaccine leading to increase in the blood pressure and perspiration thus hampering the vaccine intake.

Shortage of vaccines at the health centre has delayed the vaccine; people faced stress and anxiety before vaccine intake due to unforeseen future effects on health of individuals. Misconceptions and fake news had forced people to reconsider the choice to take vaccine or not due to lack of knowledge and awareness regarding the benefits of vaccine. Also cultural and religious beliefs had prohibited the people from vaccination and personal events in past, lifestyle and rapid development of vaccine were the few challenges people faced before the vaccine intake. Thus, people need to be made aware and educated to eradicate these factors and improve the acceptance of the covid-19 vaccine.

CONCLUSIONS

In this study we found eight factors which has affected the acceptance of covid-19 vaccine among vaccinated individuals with comorbidities such vaccine registration & technological factors, factors related to comorbidities, personal factors, knowledge and awareness factors, physical, Social, Cultural & Religious factors, vaccine

availability factors, psychological and physical factors. Also this study found that the demographic variable educational qualification has a significant association ($p = 0.05$) with acceptance of COVID-19 vaccine among vaccinated individuals with comorbidities of urban areas of Anand district. In order to modify these factors the healthcare providers and government should work hand in hand to spread the awareness through health promotion and education regarding the benefits and efficacy of covid-19 vaccine and also the importance of getting vaccinated especially the comorbid individuals who are at a greater risk of getting severe life threatening covid-19 infection. Also government should work on evacuating the myths about the safety of the vaccine.

SOURCES OF SUPPORT

None

CONFLICTING INTEREST

None declared

FUNDING

This study did not receive any funding from any organization

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved and reviewed by the Institutional Ethical Committee of CHARUSAT University (IEC-CHARUSAT) proposal id-CHA/IEC/ADM/21/11/1643.09. Informed

consent was obtained from all the participants

ACKNOWLEDGEMENT

The authors would like to acknowledge all the participants for their contribution in this study.

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