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Original Research Article

Perception on COVID-19 vaccines among the employees of Annamalai University, Chidambaram, Tamil Nadu: a cross sectional study

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ABSTRACT

Background: The corona virus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV-2) was declared global pandemic in March 2020. Globally, this disease has caused more than 5.1 million deaths. Vaccines against COVID-19 considered as the most efficient way to stop the spread of this disease. The perception about the COVID vaccine has a greater impact on the vaccination against this disease. The objective of this study is to assess the Level of perception on COVID-19 vaccines and to find out the factors associated with level of perception on COVID-19 vaccines.
Methods: A descriptive cross-sectional study was conducted among 651 employees of Annamalai University during the month of October 2021 to March 2022. A pretested semi structure questionnaire was used to collect the data. Collected data was entered in Microsoft excel and analysis was done using statistical package of social sciences (SPSS) version 17.0.
Results: Out of 651 participants, 69.4% were males, 84% were married, 34.4% i.e., 225 participants belong to 41-50 age category. With mean age 41.78±9.708. 26.8% had a favorable perception towards vaccine. The level of perception is significantly associated with educational status and vaccination status of the study participant.
Conclusions: 45% of the participants had neutral level of perception on the COVID-19 vaccines. The educational status of the participant and favourable perception on the COVID-19 vaccines have the influence on the COVID vaccination status.

Keywords: COVID19, Vaccines, Annamalai University, Perception

INTRODUCTION

The Corona Virus disease 2019 (COVID-19) caused by Severe Acute Respiratory Syndrome Corona Virus 2 (SARS CoV-2) was declared as public health importance in January 2020 and then as pandemic in the March 2020 by World Health Organization (WHO).[1] This disease has not only caused high mortality but also caused economic burden.

Globally, till the end of September 2022, more than 60.5 million were infected with COVID-19 infection and it has caused 6.5 million deaths.[2] Since there was no specific treatment for COVID-19, vaccine development was considered as milestone. One of the effective and safest way in halting the transmission is by sufficient vaccination against this infection.[3]

Various vaccines against COVID-19 were safely developed and came into market via Emergency Use Authorization (EUA). Many countries started administration of the COVID-19 vaccines as soon as possible. In India, the second largest populated country, COVID-19 vaccination campaign began on 16th January 2021.[4] The vaccination drive was carried out in a phased

manner, giving first priority to the persons who had higher chance of contracting the disease.[5] The vaccine such as Oxford- AstraZeneca (Covishield), Covaxin and Sputnik v were the major vaccines used in India.[4]

Tamil Nadu also initiated COVID-19 vaccination on 16 January 2021, in a phasic manner. As on 27 December 3.3 million people received the second dose and 4.9 million received the first dose.[6]

Even though COVID-19 vaccines were proved to be safe and effective.[7] Hesitancy to get vaccinated prevailed high among many people and this can be due to many factors such as cultural belief, mistrust in vaccine, inadequate knowledge and awareness, influence of social media, and unknown side effects of the vaccines.[8]

Many studies have been conducted on the knowledge, attitude and vaccine hesitancy on COVID-19 vaccines. Only fewer studies have been done to find out the perception on the COVID-19 vaccines and only few reviews of literatures are available on the levels of perception on COVID-19 vaccines.

The study on levels of perception gives us the overall perspective view on the knowledge gap and attitude regarding covid vaccination.

Hence this study was done to assess the level of perception on COVID-19 vaccines and to find out the factors associated with level of perception on COVID-19 vaccines.

METHODS

Study design and area

A descriptive cross-sectional study was conducted among the employees of Annamalai University in Chidambaram, Tamil Nadu. The study was conducted from October 2021 to March 2022 (6 months).

Sample size

This study was done as a part of my dissertation work. A similar study was conducted by the CMC Vellore.[9] Based on that study the unvaccinated is 27.2% with relative risk 0.35 and keeping this as a prior information, sample size was calculated using nMaster sample size calculator Software. Cohort study procedure was adopted. Keeping power of the study as 80% and level of significance as 5%. The calculated sample size was 651 with proportion of vaccinated to unvaccinated as 20:1. The study participants were selected by convenient sampling technique.

Inclusion criteria

All the employees who are employed in Annamalai University and willing to participate were included.

Exclusion criteria

Those who are not willing to participate were excluded.

Study procedure

After obtaining ethical approval from the institutional human ethics committee of Rajah Muthiah Medical College and Hospital and after getting permission from concern authorities. The study participants were selected from various Departments of Annamalai University such as Arts and Science, Agriculture, Polytechnic college, Office staffs and Marine Biology. After getting written consent from study participant. The data was collected using a pretested semi structured questionnaire. The questionnaire included socio demographic profile such as age, sex, marital status, socio economic status, vaccination status, vaccine preference, vaccine hesitancy. The perception on COVID-19 vaccine was assessed using a vaccine attitude examination (VAX) scale.[10] This scale was adopted and modified accordingly. The questionnaire was translated to native language for better understanding of the questions.

Statistical analysis

The collected data was entered in Microsoft excel and statistical analysis was done using statistical package of social sciences (SPSS) version 17.0. From the data collected the levels of perception were obtained by applying K mean cluster analysis. The chi square test was done to find out the factors associated with the level of perception with each cluster.

RESULTS

Out of 651 study participants, 69.4% were males, 84% were married and 225 (34.4%) belong to age category of 41-50 years. The mean age of the participants was 41.78±9.708. 70% of the study participants have attained educational qualification of graduate and above. Among 651 participants, 95.4% of the individuals has received either first dose or completed second dose of vaccination. 125 participants have contracted COVID infection in the past. 374 (57.5%) participants have delayed in getting the COVID-19 vaccine (Table 1).

Table 2 shows the distribution of response of the study participants based on VAX scale on COVID vaccine. 31.5% disagree to this statement “COVID-19 is a new disease and vaccines against it have not been fully tested and will not be safe”. 61.4% believe that vaccine can stop serious infection. 51.1% agree that natural exposure to viruses and germs gives the safest protection than being exposed through vaccination. 66.8% of the study participants agree that COVID-19 vaccines were created quickly, but was carefully tested for safety and 93.8% of the participant agrees to appropriate precautionary measurement must be followed even after vaccination.

Table 1: Socio-demographic profile and COVID related profile of the participants.

Variable and category	Frequency (n=651)	Percentage
Age category (years)		
21-30	111	17.1
31-40	168	25.8
41-50	225	34.4
51-60	147	22.6
Gender		
Male	452	69.4
Female	199	30.6
Religion		
Hindu	560	86.0
Others	91	14
Educational status		
Graduate and above	455	69.9
High school level	171	26.3
Up to middle school	25	3.8
Marital status		
Married	546	83.9
Unmarried	101	15.5
Widowed	4	0.6
COVID vaccination status		
Vaccinated	631	95.4
Unvaccinated	20	4.6
Previous COVID infection		
No	526	80.8
Yes	125	19.2
Delay in vaccination		
Present	374	57.5
Absent	277	42.5

Table 3 shows the classification of the study participant after applying K mean cluster. The study participants were divided into three clusters (levels of perception). In cluster 1, 31.5% have disagreed to the statement that COVID-19 is a new disease and vaccine against it have not been fully tested and will not be safe. This cluster have positive attitude towards the COVID-19 vaccines. Hence this cluster is named as the favourable perception cluster. In cluster 2, most of the participants have prioritized that the most of the vaccines appear safe but there might be problems that have not been discovered yet, COVID-19 vaccine causes unforeseen problems in children and they worry about the unknown side effects of the vaccine in the future. Hence the participants in this cluster have negative attitude towards the COVID-19 vaccines. This cluster is named as unfavourable perception cluster. In cluster 3 participants have neither favourable nor unfavourable perception i.e., they had neutral attitude towards most of statements towards the COVID-19 vaccines. Majority of the study participants (45.3%) belong to the cluster 3 i.e., participant with neutral perception.

Table 4 shows the distribution of the study participant according the level of perception on COVID-19 vaccines. 172 (26.42%) participants had a favourable perception towards the COVID-19 vaccine. Whereas 45.32% i.e., 295 of the participants had neutral opinion on the COVID vaccines. The remaining 184 (28.26%) had unfavourable perception on COVID-19 vaccines.

Chi square test was applied to find out the association of the between the levels of perception and socio demographic factors. Individual with higher educational status had favourable perception toward the COVID-19 vaccines compared with individuals with lesser educational status and this was found to be statistically significant (p=0.011). Age, gender and place of residence were not significantly associated with level of perception (Table 5).

Table 6 shows the association between the levels of perception of COVID vaccine with COVID-19 infection and vaccination status. Among the unvaccinated there 73.3% had neutral perception towards vaccination. Among vaccinated 27.2% had a favourable perception toward vaccination (p=0.001). There was no significant association between previous covid infection or delay in vaccination.

Table 2: Distribution of participants perception based on the VAX scale*.

Statements of the VAX scale*	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
COVID-19 is a new disease and vaccines against it have not been fully tested and will not be safe	70(10.8)	135 (20.7)	259 (39.8)	168 (25.8)	19 (2.9)
I feel safe after being vaccinated against COVID	9 (1.4)	39 (6.0)	221 (33.9)	283 (43.5)	99 (15.2)
COVID vaccine also protects other people who are not vaccinated	51(7.8)	184 (28.3)	193 (29.6)	182 (28.0)	41 (6.3)
I can rely on vaccines to stop serious infectious diseases	14(2.2)	40 (6.1)	197 (30.3)	345 (53.0)	55 (8.4)
Although most vaccines appear to be safe, there may be problems that we haven't yet discovered	5 (0.8)	43 (6.6)	254 (39.0)	310 (47.6)	39 (6.0)

Continued.

Statements of the VAX scale*	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
Natural exposure to viruses and germs gives the safest protection than being exposed through vaccination	38 (5.8)	48 (7.4)	232 (35.6)	249 (38.2)	84 (12.9)
COVID vaccines can cause unforeseen problems in children	5 (0.8)	97 (14.9)	313 (48.1)	216 (33.2)	20 (3.1)
I worry about the unknown effects of COVID vaccines in the future	9 (1.4)	98 (15.1)	230 (35.3)	284 (43.6)	30 (4.6)
The COVID vaccines were created quickly, but was carefully tested for safety	1 (0.2)	30 (4.6)	185 (28.4)	366 (56.2)	69 (10.6)
Appropriate precautionary measurement must be followed even after vaccination (wearing mask, and hand washing)	1 (0.2)	3 (0.5)	36 (5.5)	287 (44.1)	324 (49.8)

*VAX scale is modified according to the study.

Table 3: Final cluster on level of perception.

Statements	Cluster 1	Cluster 2	Cluster 3
COVID-19 is a new disease and vaccines against it have not been fully tested and will not be safe	2	3	3
I feel safe after being vaccinated against COVID-19	4	4	3
COVID-19 vaccine also protects other people who are not vaccinated	3	4	2
I can rely on vaccines to stop serious infectious diseases	4	4	3
Although most vaccines appear to be safe, there may be problems that we haven't yet discovered	3	4	3
Natural exposure to viruses and germs gives the safest protection than being exposed through vaccination.	3	4	4
COVID vaccines can cause unforeseen problems in children	3	4	3
I worry about the unknown effects of COVID-19 vaccines in the future	3	4	3
The COVID-19 vaccines were created quickly, but was carefully tested for safety	4	4	3
Appropriate precautionary measurement must be followed even after vaccination (wearing mask and hand washing)	5	5	4

Table 4: Distribution of participant according to the level of perception on COVID-19 vaccine.

Level of perception on COVID-19 vaccines	N=651	Percentage
Favourable perception	172	26.42
Unfavourable perception	184	28.26
Neutral perception	295	45.32

Table 5: Association between levels of perception on COVID-19 vaccines and socio-demographic variable of the participants.

Variables	Favourable perception		Unfavourable perception		Neutral perception		Chi- square value	df	P value
	N	%	N	%	N	%			
Age category (years)									
21- 30	28	25.2	34	30.6	49	44.1	10.805	6	0.095
31- 40	33	19.6	54	32.1	81	48.2			
41-50	72	32.0	50	22.2	103	45.8			
51- 60	39	26.5	46	31.3	62	42.2			

Continued.

Variables	Favourable perception		Unfavourable perception		Neutral perception		Chi- square value	df	P value
	N	%	N	%	N	%			
Gender									
Male	115	25.4	138	30.5	199	44.0	3.765	2	0.152
Female	57	28.6	46	23.1	96	48.2			
Place of residence									
Urban	158	27.5	163	28.4	253	44.1	3.916	2	0.141
Rural	14	18.2	21	27.3	42	54.5			
Educational status									
Graduate and above	134	29.5	120	26.4	201	44.2	13.070	4	0.011
High school level	34	19.9	60	35.1	77	45.0			
Up to middle school	4	16.0	4	16.0	17	68.0			

Table 6: Association between levels of perception and COVID-19 infection and vaccine related variables among study participants.

Variables	Favourable perception		Unfavourable perception		Neutral perception		Chi-square value	df	P value
	N	%	N	%	N	%			
COVID vaccination status									
Vaccinated	169	27.2	179	28.8	273	44.0	10.154	2	0.001
Unvaccinated	3	10.0	5	16.7	22	73.3			
Previous COVID infection									
Not infected	136	25.9	152	28.9	238	45.2	0.723	2	0.697
Infected	36	28.8	32	25.6	57	45.6			
Delay in vaccination									
Present	93	24.9	100	18.4	181	48.4	3.369	2	0.185
Absent	79	28.5	84	30.3	114	41.2			

DISCUSSION

In this study on perception on COVID-19 vaccines among the employees of Annamalai University, Chidambaram, Tamil Nadu. Out of 651 study participants nearly half of the participants i.e., 45.32% had neutral perception on COVID-19 vaccines. 57.5% of the participant were hesitant and delayed in getting the COVID vaccine. In the present study, participants were divided into three clusters. The three clusters are participant with favourable perception, unfavourable perception and neutral perception towards the COVID-19 vaccines.

In the present study the participants (29.5%) with the educational qualification of graduate and above had a favourable perception towards the vaccines. This can be explained by participants with higher education might have more knowledge and accesses to scientific information on COVID-19 vaccines, hence they might have a favourable perception towards the COVID-19 vaccines. Whereas the participants with educational qualification up to middle school (68%) had a neutral perception towards the COVID-19 vaccines. The lack of knowledge and information of COVID-19 vaccines might the cause for the neutral perception on the vaccines.

In the present study 28.8% are with unfavourable perception have been vaccinated. This is due to the employees were compelled to get vaccinated even though they had negative attitude towards COVID-19 vaccines. Only 10% of the study participant who had favourable perception were unvaccinated. Whereas majority of the participant who are unvaccinated have a neutral perception on the COVID-19 vaccines. This may be due to inadequate knowledge or lack of information on the covid vaccines. On further analysis we came to know that most of the participants who are unvaccinated are with educational qualification up to the middle level.

Some of the limitations of this study are it was carried out few months after initiation of COVID-19 vaccination campaigns hence the initial perception on COVID-19 vaccines could not be studied. The questions were answered by recall method and bias may prevail while recall. Some factors on COVID-19 vaccines such as reasons for delay in vaccination, perception of members of the family and family members covid infection status were not included in this study.

CONCLUSION

Most of the participant (45.3%) had neutral perception on COVID-19 vaccines. Educational qualification plays a

vital role in the development of favourable perception on COVID-19 vaccines among the people. Perception on COVID-19 vaccines influences on the vaccination status.

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