



Perceptions Regarding Covid-19 Vaccines Among General Population Visiting Tertiary Care Hospital in Moradabad, Uttar Pradesh

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KEYWORDS

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ABSTRACT:

Aim: Numerous vaccines have been introduced and circulated worldwide but minimal literature is available on the KAP of the population, so this study was conducted with the aim of assessing knowledge, attitude and practices regarding Covid-19 Vaccination among the patients attending out-patient department of Teerthanker Mahaveer Dental College And Research Centre.

Materials and Methods: A cross sectional survey was conducted among 426 individuals and data about knowledge, attitude and practices was collected using a questionnaire. The questionnaire consisted of 4 sections including the demographic details of the patient, knowledge- section, attitude-section and practices-section. Independent t-test along with Anova test was applied for the purpose of statistical analysis. Binary logistic regression was also calculated based on the data collected.

Result: Majority of the participants presented with high-level of knowledge where as nearly of them were having positive attitude towards the Covid-19 Vaccination. Numerous participants (94.6%) preferred free administration of vaccine in India. 355 out of 426 study subjects agreed to afford vaccine at their own expense whereas few(n=71) were reluctant to do so. Internet was considered the most preferred source of information about the Covid-19 Vaccines.

Conclusion: The present study participants presented with high knowledge and positive attitudes towards Covid-19 vaccination still the resistant population should be reached and encouraged for the administration of the vaccines by instilling proper education and awareness among them.



INTRODUCTION

Coronavirus disease (COVID-19) is a fatal viral disease which is still affecting many countries all over the globe. SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) is a new coronavirus strain that has spread all over the world and has become a serious concern.^[1] A secure and efficacious vaccine for the Coronavirus disease 2019 (COVID-19) which is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) had been the need of the hour for all Health service organizations all over the world.^[2] The whole procedure of development of vaccine is a steady, gradual and tedious process, undergoing various other steps for scrutiny of its strength, effectiveness and safety and more particularly in those individuals who are at a high risk viz., elderly, pregnant women, and people with co-morbidities, and immune-deficiencies.^[3]

Seven different vaccines have been circulated in various countries as of February 18, 2021. In all countries vulnerable groups have been given a priority for vaccination. At the same time, an additional of more than 200 vaccine candidates are being developed, with more than 60 of them in clinical trials WHO and its collaborators in 2020 launched COVAX which is a component of the ACT accelerator. All these vaccines cornerstones of ACT accelerator focuses to bring the COVID-19 pandemic's acute phase to an end.^[4]

However, still people are uncertain about the safety and efficacy of vaccines along with the persistence of protection against COVID-19, as many cases of reinfection have been reported ^[5,6]. The high speed advancement of vaccines casts doubt on safety.^[7]

And with the advancing news about SARS-CoV-2 vaccines approval, it is expected that this pandemic could end through achieving herd immunity ^[8,9]. The threshold for SARS-CoV-2 herd immunity is estimated to range between 50% and 67%.^[8] The

major difficulty we are supposed to be having in the achievement of this goal is vaccine hesitancy and skepticism among the population worldwide.^[10-13] WHO Strategic Advisory Group of Experts (SAGE) defined vaccine hesitancy as “delay in acceptance or refusal of vaccination despite availability of vaccination services”.^[12]

Getting vaccinated against the virus is a voluntary decision in many of the countries, it is therefore important to know about the knowledge, attitude and practices of the population regarding Covid-19 vaccines. This study aims to assess the level of knowledge, attitudes, and practices regarding Covid-19 vaccination among patients attending out-patient Department of Teerthanker Mahaveer Dental College & Research Centre.

MATERIALS AND METHODS

STUDY DESIGN

The Institutional Review Board of the University approved the study. The procedure for this present study was conducted in accordance with the principles of Declaration of Helsinki. The primary outcome of the study was to assess the knowledge, attitude and practices of the Moradabad populace towards the Covid-19 Vaccination.

A cross-sectional questionnaire based research was conducted among the Moradabad populace. Participants willing to participate in the study were approached by convenience sampling. Ethical clearance was obtained from the Institutional Review Board. A pre-structured, pre-fabricated, closed-ended questionnaire was used for the purpose of collecting data.

Participants aged above 18 years and who willingly signed the informed consent were included in the study. Individuals below 18 years and those who were mentally or physically challenged were excluded from the study.

SAMPLE SIZE CALCULATION



Following equation was used for calculation of sample size-

$$n = \frac{z^2pq}{d^2}$$

After using this equation, sample size was estimated to be 424.

QUESTIONNAIRE

The development of questionnaire was based on the literature review.[17] After signing the informed consent, pre-designed, pre-validated questionnaires were administered to the participants. Since the data obtained was self-reported, so in accordance to minimize the potential bias; participants were assured for privacy and confidentiality of their responses. The study tool was pilot tested on 30 individuals, the data of which was not included in the main study. No major significant modifications were required so after discussing with the research team, the final questionnaire version was developed. The study tool used was structured and comprised of 25 questions divided into 4 sections.

Demographic information

The first section recorded the demographic information of the study subjects such as age, sex, marital status, education, socio-economic status, residence. One additional question regarding administration of Covid-19 vaccination was added with an option of 'yes' or 'no'.

Knowledge Section

This second section comprised of 6 closed-ended questions. The first five questions collected information regarding knowledge towards Covid-19 Vaccination of individual participants. The three options available for each given questions were 'yes', 'no' and 'don't know'. The code '1' was assigned for each yes response and code '0' was assigned for each no/ don't know response. Based on the sum total score of these five questions, knowledge score of a

participant was obtained. The minimum possible score obtained was 0 and 5 was the maximum possible score. Following this score range from 0 to 5, knowledge level was assessed with maximum score indicating better knowledge and minimum score indicating low level of knowledge. In addition to this, question regarding information source for covid-19 vaccine was also included in this section.

Attitude section

The third section, that is, attitude section included six questions with three available response- 'disagree', 'undecided' and 'agree'. Three point Likert scale used for indicating each option is as follows- 0- disagree, 1- undecided, 2- agree. The attitude score, thus, was obtained by summing the scores assigned to the options chosen by the respondents. The minimum possible score for this section was 0 and maximum possible score obtained was 12. The more positive attitudes were indicated in patients with higher attitude scores.

Practices Section

This last section again comprised of 6 items, four out of which recorded responses 'yes' or 'no'. The rest two questions obtained information regarding administration of the Covid-19 vaccines.

STATISTICAL ANALYSIS

The data collected was compiled using Microsoft Excel 2019 and analyzed using Statistical Package for the Social Sciences Version 20.0. The demographic data of the patients such as age, sex, marital status, education, socio-economic status, residence was analyzed using descriptive statistics. Chi-square tests, Fisher's exact tests were used as first order analysis to assess differences in proportion. Relationship between independent and dependent variables was analyzed using bivariate logistic regression analysis. The tests used to determine the significance between mean knowledge and attitude scores with demographic details were independent t-test and ANOVA tests. A p-value for



the present study was considered statistically significant for values below 0.05.

RESULTS

Demographic details

Majority of the participants (N=328) belonged to the age category of 18-29 years whereas least number of participants (N=2) belonged to the age group of 60 years and above. Female participants were more (N=237) as compared to the male participant in the present study. More than half of the study population, that is, 77% were unmarried and only 23% were found to be married. Nearly 67.6% study populace were undergraduate, 16.2% postgraduate and school education. Middle class category was the most common option among socio-economic status chosen by 60.1% of the study subjects. Nearly 277 participants belonged to the urban area whereas 149 individuals were rural populace. Majority of the participants reported with 'yes' response (76.1%) to the question regarding administration of Covid-19 Vaccination while 23.9% of the participants responded with 'no' response. [Table 1]

Knowledge

Out of 5, the mean score obtained for knowledge section was 2.84 (SD= 0.95). The individuals with total score below the mean knowledge score were considered to have low-knowledge as compared to the participants with total score more than the mean score (high-knowledge group). Majority of the participants (n=298) presented with high level of knowledge. 92.7% and 85% study participants knew about the Covid-19 vaccine and its effectiveness respectively. 64.8% of the population reported with positive response when asked whether it is dangerous to use overdose vaccines. Numerous participants, n=347 and n=325, presented with negative or 'don't know' response when asked about the increase in allergic reaction and autoimmune disease due to vaccination respectively. [Table 2] In addition to this, internet (31.9%) was the most preferred source of

information regarding Covid-19 vaccine followed by mass media (24.6%), social media (15.3%), newspaper (12.2%), family members and relatives (9.2%) and friends and neighbors (6.8%). [Graph 3]

Attitude

The mean score obtained was 10.26 (SD=2.42). The individuals with total score more than the mean attitude score were considered to have positive attitude as compared to the participants with total score less than the mean score (negative attitude group). Nearly half of the study subjects, 262 out of 426, presented with positive attitude in this present study. Majority of the participants, 71.1% and 81.9 %, agreed to the point that newly discovered Covid-19 vaccine is safe and Covid-19 Vaccine is essential for us, respectively. 334 study subjects agreed to take Covid-19 vaccine without any hesitation, if available in India where as nearly 360 out of 426 subjects agreed to encourage their friends, family and relatives to get vaccinated. 67.8 % participants agreed to the fact that it is not possible to reduce the incidence of Covid-19 without vaccination whereas only 10.6% disagreed to this fact. 350 out of 426 participants wanted fair distribution of the Covid-19 vaccine. [Table 3]

Practices

Nearly half of the participants (57.3%) participants responded positively when asked about the side effects of newly discovered vaccines whereas 43.2% of the participants denied to the fact that Covid-19 can be eradicated by just relying on and using preventive measures. Almost all participants (94.6%) preferred free administration of vaccine in India. 355 out of 426 study subjects agreed to afford vaccine at their own expense whereas few(n=71) were reluctant to do so. In addition to this, on asking which population should be vaccinated on priority basis, nearly 80.5% of the participants selected 'health worker' as their response followed by 14.1% for general public. [Table 4] Only 3.5% and 1.4% of the study subjects wanted public/private employees and



teachers/students to be vaccinated first, respectively, with least percentage score of 0.5% for garment worker. [Graph 2] More than half of the participants 316 out of 426 responded with option 'everyone' among all the other available options when asked 'who should be vaccinated' whereas the least response was obtained (n=3) for the option 'newly recovered from Covid-19'. [Graph 3]

Binary logistic regression was performed between the knowledge score and the general demographic details of the study participants. The under-graduated participants considerably reduced the odds of having high knowledge score as compared to the participants with school-education and post-graduation (p-value= 0.005). Lastly, subjects belonging to the upper class ((p-value -0.006) and upper middle class (p-value = 0.032) significantly lower odds of getting high knowledge as compared to middle class, lower middle class, lower class. [Table 5]

The binary logistic regression was performed between attitude score and general demographic information of the study subjects and the results has been presented in Table 6. The study participants with administration of both the doses of Covid-19 significantly lower the odds of positive attitude towards Covid-19 vaccination when compared to those who have not administered the Covid-19 vaccine yet.

DISCUSSION

Through the history, the role of vaccination in prevention and reduction of the infectious diseases cannot be ruled out. Though numerous vaccines have been introduced but the success of these depend upon proper implementation strategies and most importantly knowledge, attitude and perception of the general population towards Covid-19 Vaccination.

In this survey, majority of the participants (92.7%) knew about the Covid-19 vaccine while 88% participants heard about the vaccine in a study conducted by Al-Marshoudi S. et al. [14] Comparable

results were found when similar studies were conducted in 19 different countries [15]. The level of knowledge regarding Covid-19 Vaccines was found to be significantly associated with education and socio-economic status of the populace. The reason for this might be more accessibility to correct information by those with appropriate level of education and also to those belonging to upper and upper middle class groups. Similar results were found in a study conducted in Bangladesh [16].

The most common source of information regarding vaccine in this survey was internet (31.9%) followed by mass media (24.6%), social media (15.3%), newspaper (12.2%), family members and relatives (9.2%) and friends and neighbors (6.8%). These findings were supported by KAP survey by Ali et al. and Al hanawi MK et al. in Saudi Arabia and Egypt which stated social media (85.8% and 80.0%, respectively) and television (35.7% and 80.8%, respectively) as the most preferred source of information [17]. The wide implementation of vaccine can only be achieved after eliminating the rumors and relying on trustworthy official sites for the source of information.

More than two-thirds of the population (71.1%) agreed to the fact that newly discovered Covid-19 vaccine is safe. Similarly nearly two thirds (59%) of the population believed in safe and effective development of the vaccine in a study by El- Elimat T et al. [18] Numerous participants (81.9%) stated that vaccine is essential for us in this study which is similar to the study conducted by El- Elimat T et al. where 66.5% participants agreed for the same [18]. In this study 78.4% of the participants agreed to take the Covid-19 vaccine without any hesitation. Quite similar results were found in a study done by Decot et al. in which 77% of the participants agreed to take the vaccine. [19] Panama (87.44%) and Australia (92.88%) were the countries with highest frequencies of positive responses. In contrast to this, Egypt (43.55%) and Russia (51.34%) presented with lowest proportion of responses. The data showed great



disparateness among participants belonging to different countries when asked about their willingness to administer vaccine. [15]

More than half of the participants (57.3%) in the present study responded positively when asked about the side effects of the vaccine. These results were in consistency with the study conducted in USA by Pogue K et al. where majority of the participants were worried about the side effects of the COVID-19 vaccines [20]. Almost all participants in the current study wanted free administration of vaccine in India which is in contrast with the results conducted by El-Elmat T et al. in which only 36.2% believed that the government will be able to provide the vaccine for free [18]. These factors somewhere affect the acceptability and affordability of the vaccine by the populace.

This study was conducted for a short period of time which can account as one of the limitation of the study. It is well known that more appropriate and valuable data are provided through longitudinal research when compared with the cross sectional research but since former is cumbersome and challenging; it was not possible to organize it.

It is recommended that free administration of vaccines should be done to the targeted population and it should be distributed evenly among them. Campaign should be conducted nationally to promote vaccine. In addition to this, community acceptance of the vaccine should be encouraged and every single doubts of the general population should be answered with the help of tele-seminars or tele-consultations.

CONCLUSION

The Covid-19 Pandemic has not yet discontinued wrecking havoc on the population globally. Though majority of the participants in this study presented with high knowledge and positive attitudes towards Covid-19 vaccination still the resistant population should be reached and influenced through imparting proper knowledge among them using urgent health

education programs. The vaccines must be made freely available or at subsidized prices by the government for universal acceptance of the vaccines.

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**TABLE 1. DEMOGRAPHIC DETAILS OF THE PARTICIPANTS**

Variables		Frequency	Percent
Age	18-29 years	328	77.0
	30-39 years	50	11.7
	40-49 years	36	8.5
	50-59 years	10	2.3
	60 & above	2	.5
Gender	Male	189	44.4
	Female	237	55.6
Marital Status	Unmarried	328	77.0
	Married	98	23.0
Education	School Education	69	16.2
	Undergraduate	288	67.6
	Postgraduate	69	16.2
Socio- economic Status	Upper Class	28	6.6
	Upper Middle Class	97	22.8
	Middle Class	256	60.1
	Lower Middle Class	35	8.2
	Lower Class	10	2.3
Residence	Urban	277	65.0
	Rural	149	35.0
Taken Covid-19 Vaccination	Yes	324	76.1
	No	102	23.9

TABLE 2. PARTICIPANTS KNOWLEDGE TOWARDS COVID-19 VACCINE

	Yes (%)	No/Don't Know (%)
Q1. Do you know about the COVID-19 vaccine?	395 (92.7)	31 (7.3)
Q2. Do you know about the effectiveness of COVID-19 vaccine?	362 (85.0)	64(15.0)
Q3. Is it dangerous to use overdose vaccines?	276 (64.8)	150 (35.2)
Q4. Does vaccination increase allergic reactions?	79 (18.5)	347(81.5)
Q5. Does vaccination increase autoimmune diseases?	101 (23.7)	325 (76.3)

**TABLE 3. PARTICIPANTS ATTITUDE TOWARDS COVID-19 VACCINE**

	Disagree	Undecided	Agree
The newly discovered COVID-19 vaccine is safe.	28(6.6)	95(22.3)	303(71.1)
The COVID-19 vaccine is essential for us.	24(5.6)	52(12.2)	349(81.9)
I will take the COVID-19 vaccine without any hesitation, if it is available in India.	30(7.0)	62(14.6)	334(78.4)
I will also encourage my family/friends/relatives to get vaccinated.	21(4.9)	45(10.6)	360(84.5)
It is not possible to reduce the incidence of COVID-19 without vaccination.	45(10.6)	92(21.6)	289(67.8)
The COVID-19 vaccine should be distributed fairly to all of us.	19(4.5)	57(13.4)	350(82.2)

TABLE 4. PARTICIPANTS PRACTICES TOWARDS COVID-19 VACCINE

	Yes (%)	No
Q1. Do you think the newly discovered COVID-19 vaccine may have side effects?	244 (57.3)	182 (42.7)
Q2. Do you think that if everyone in the society maintains the preventive measures, the COVID-19 pandemic can be eradicated without vaccination?	242 (56.8)	184(43.2)
Q5. Do you think the vaccine should be administered free of charge in India?	403 (94.6)	23 (5.4)
Q6. Would you afford the vaccine at your own expense if it was not provided free by the government, do you think?	355 (83.3)	71(16.7)

**TABLE 5. BINARY LOGISTICAL REGRESSION ANALYSIS OF KNOWLEDGE SCORE**

	B		S.E.	Wald		df	Sig.	Exp(B)		95% C.I. for EXP(B)	
										Lower	Upper
<u>AGE</u>				0.171		4	0.997				
18-29 years	20.403	25522.012		0		1	0.999	725990827		0	.
30-39 years	20.442	25522.012		0		1	0.999	754726269		0	.
40-49 years	20.438	25522.012		0		1	0.999	751916845		0	.
50-59 years	20.085	25522.012		0		1	0.999	527949298		0	.
60 & above	Reference										
<u>SEX</u>											
Male	0.399	0.266		2.244		1	0.134	1.49		0.884	2.512
Female	Reference										
<u>MARITALSTATUS</u>											
Unmarried	-0.742	0.377		3.868		1	0.049	0.476		0.227	0.997
Married	Reference										
<u>EDUCATION</u>				11.98		2	0.003				
School Education	-0.002	0.426		0		1	0.996	0.998		0.433	2.3
Undergraduate	0.86	0.306		7.917		1	0.005	2.363		1.298	4.3
Postgraduate	Reference										
<u>SOCIO-ECONOMIC STATUS</u>				14.472		4	0.006				
Upper Class	3.827	1.388		7.598		1	0.006	45.925		3.022	697.968
Upper Middle Class	2.537	1.18		4.624		1	0.032	12.643		1.252	127.701
Middle Class	2.126	1.159		3.365		1	0.067	8.383		0.865	81.268



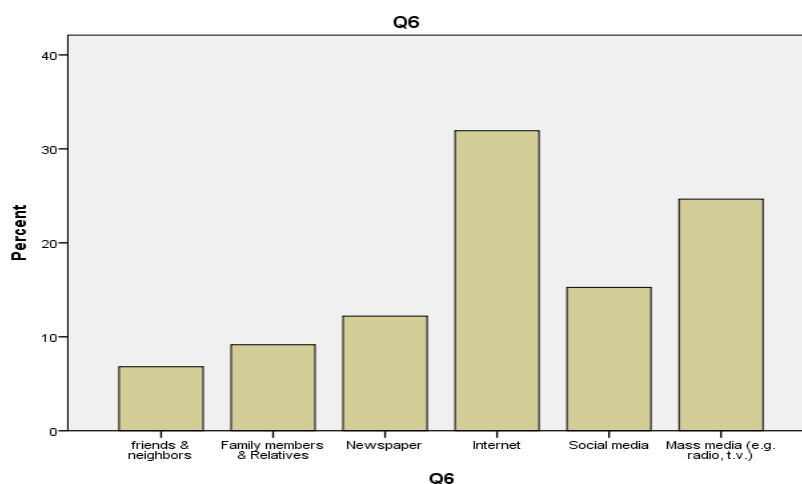
Lower Middle Class	1.266	1.201	1.111	1	0.292	3.546	0.337	37.334
Lower Class	Reference							
<u>RESIDENCE</u>								
Urban	-0.195	0.26	0.564	1	0.453	0.823	0.495	1.369
Rural	Reference							
<u>TAKEN COVID-19 VACCINATION</u>								
Yes	-0.16	0.283	0.318	1	0.573	0.852	0.489	1.485
No	Reference							

TABLE 6. BINARY LOGISTICAL REGRESSION ANALYSIS OF ATTITUDE SCORE

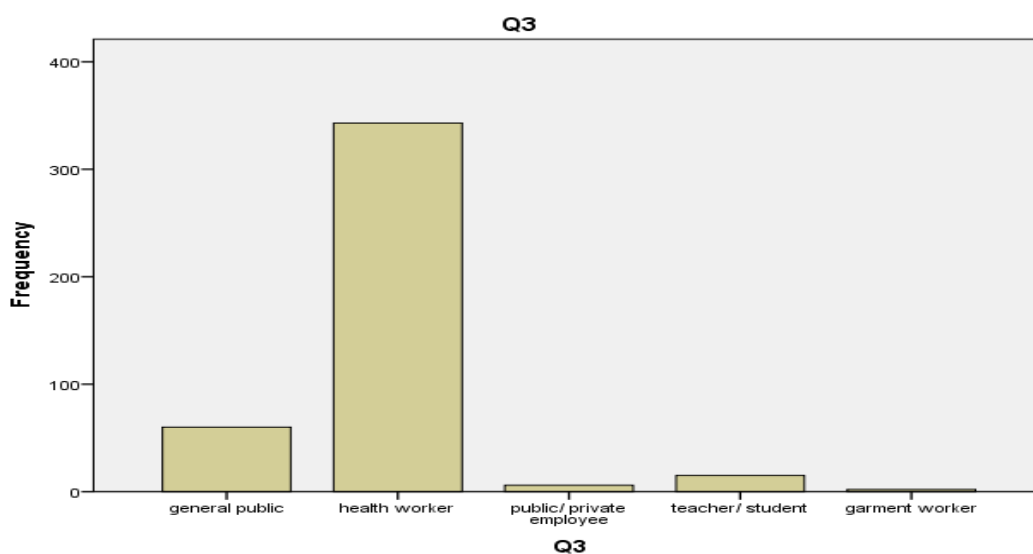
	B	S.E.	Wald	df	Sig.	Exp(B)	95% EXP(B)	C.I.for
							Lower	Upper
<u>AGE</u>			3.493	4	.479			
18-29 years	-.107	1.718	.004	1	.950	.899	.031	26.072
30-39 years	.277	1.706	.026	1	.871	1.319	.047	37.391
40-49 years	.548	1.728	.100	1	.751	1.729	.058	51.139
50-59 years	1.307	1.872	.488	1	.485	3.696	.094	144.820
60 & above	Reference							
<u>SEX</u>								
Male	.078	.232	.113	1	.736	1.081	.686	1.703
Female	Reference							
<u>MARITAL STATUS</u>								
Unmarried	-.207	.345	.359	1	.549	.813	.413	1.600
Married	Reference							
<u>EDUCATION</u>			3.312	2	.191			
School Education	-.679	.421	2.605	1	.107	.507	.222	1.157
Undergraduate	-.505	.306	2.734	1	.098	.603	.331	1.098
Postgraduate	Reference							
<u>SOCIO-ECONOMIC STATUS</u>			5.189	4	.268			
Upper Class	1.434	.914	2.462	1	.117	4.194	.700	25.142
Upper Middle Class	1.392	.821	2.878	1	.090	4.023	.805	20.098



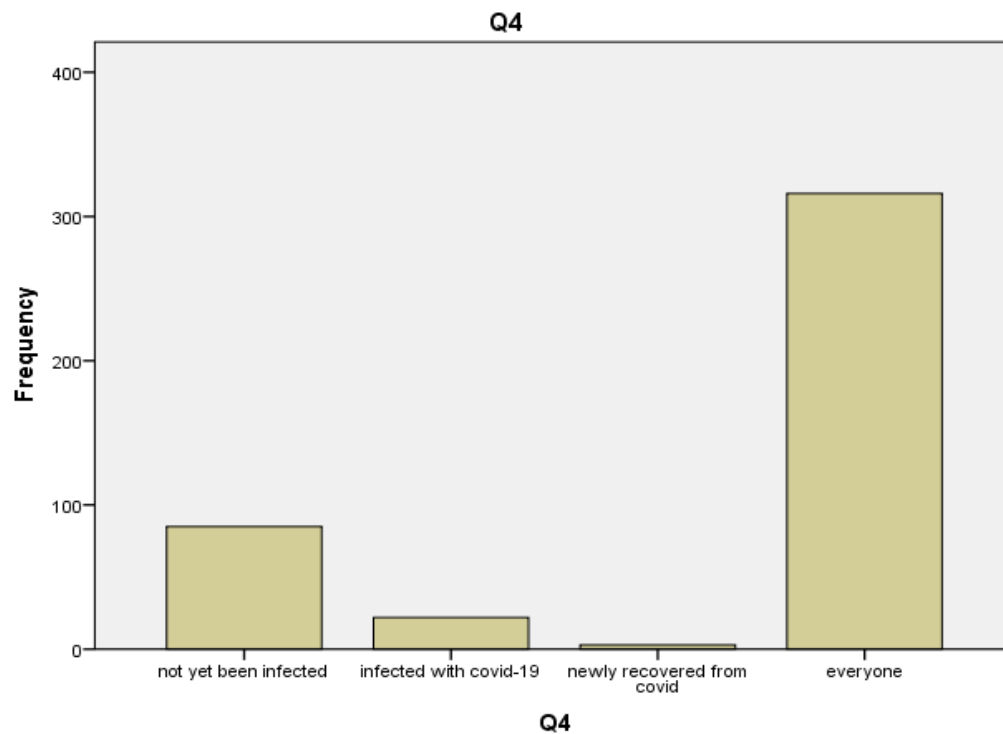
Middle Class	1.185	.801	2.188	1	.139	3.270	.680	15.712
Lower Middle Class	.534	.838	.407	1	.524	1.706	.330	8.814
Lower Class	Reference							
<u>RESIDENCE</u>								
Urban	.151	.230	.429	1	.512	.860	.547	1.351
Rural	Reference							
<u>TAKEN COVID-19 VACCINATION</u>								
Yes	.512	.256	3.983	1	.046	.600	.363	.991
No	Reference							



GRAPH 1: PARTICIPANTS SOURCE OF KNOWLEDGE ABOUT COVID-19 VACCINE



GRAPH 2: PARTICIPANTS RESPONSE TO WHO'S SUPPOSED TO BE VACCINATED FIRST?



GRAPH 3: PARTICIPANTS RESPONSE TO WHO SHOULD HAVE BEEN VACCINATED?