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Research Article

Contemporary Survey on Perspective of General Public Following Vaccination Process Against Covid-19 Infection

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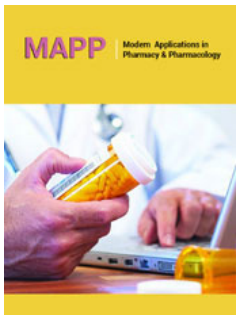

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Abstract

Objectives: In the midst of current health crises due to COVID-19 pandemic faced by entire human race, vaccination drive against COVID-19 is initiated globally, including in India. Vaccine hesitancy is one of the greatest hurdles faced by the regulatory authorities of India. Current survey is an attempt to understand the mental thought process of general public from the Ahmedabad district of Gujarat state in India related to COVID-19 vaccination.

Study design: Narrative

Methods: Current survey was conducted on the residents of rural and urban localities of Ahmedabad district of Gujarat State in India. Questionnaire was prepared using Google forms and link was forwarded to over 500 people. Collected responses were calculated as percentages using Microsoft Excel and were correlated with demographic data. Statistical analysis of the collected data was performed using SPSS 21.0, $p<0.05$ was considered as statistically significant difference.

Results: Current survey findings revealed that majority of participants were either unaware, had very less information or believed in misleading facts regarding COVID-19 and vaccination against COVID-19. Main reasons for hesitancy towards vaccination were observed to be unfriendly registration process, non-availability of vaccine at door steps and unsurety of vaccine effectiveness.

Conclusion: On the basis of current survey findings, it was concluded and strongly recommend to train young individuals; locality wise (specifically in rural areas), who can disseminate reliable and correct information in their community/locality regarding COVID-19, its prevention, management and treatment; in addition to importance and benefits of vaccination against COVID-19.

Keywords: COVID-19; Corona virus; Vaccines; Survey; Pandemic; India

Introduction

Retrospection of history reveals that human race have evidenced several catastrophic virus associated infectious diseases like encephalitis, MERS, zika, avian flu, poliomyelitis, ebola, dengue, SARS to list a few [1,2]. It is evident that viral infections incessantly lead to epidemic or pandemic circumstances resulting in significant sustainable and consequential health and socioeconomic debilitation of entire human race [2]. In 2019 Wuhan city in the Hubei Province, China witnessed an unidentified disease leading to lung fibrosis and pneumonia like symptoms [3]. WHO was reported about this identified disease by China in December 2019 and later on the disease took an epidemic state in China in beginning of 2020 [3,4]. Viral infection was identified as the causative factor of the unidentified disease by Chinese centre for disease control and prevention who name the causative virus as novel coronavirus (CoV2) [5]. WHO declared the disease caused by coronavirus as health emergency of international concern and named the viral infection as coronavirus disease-2019 (COVID-19) [6]. Currently corona

virus is referred as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and COVID-19 has expanded worldwide to take global pandemic state leading to most challenging health crises encountered by human race in last few decades. CoV2 that belongs to Coronaviridae family extensively spread among humans leading to respiratory, hepatic, enteric and neurologic ailment [7,8]. As on 13 May 2021 nearly 160 million people worldwide are infected with CoV2 and almost 3.3 million people have lost their lives due to COVID-19 [9]. The twenty first century has discerned not only a significant global socioeconomic impact due to COVID-19 but also the disease has proven to be the most dreadful health crises encountered by mankind with very high mortality and morbidity rates.

The situation is direr particularly in India, with fragile and fragmented buckling healthcare system and a deadly second wave of infections sweeping across the country. As on 13 May, 2021; more than 23 million people in India are infected with coronavirus and more than 0.25 million people have lost their lives due to COVID-19 [9]. India has nearly vertical coronavirus case growth and reported deaths curves. Hospitals in India have been overwhelmed and have had to turn away several infected patients since there aren't enough beds and also due to severe shortage of oxygen [10]. Looking at the current scenario vaccination is recognized as the only possible long-term solution to control COVID-19 pandemic in India and other countries globally. Several countries including India have developed and trialed various vaccines against the corona virus. In India at the onset of vaccination drive against COVID-19, two vaccines received approval for emergency use; one amongst them was Covishield vaccine jointly developed and manufactured by Oxford-AstraZeneca and Serum Institute of India and the other vaccine was Covaxin that was indigenously developed and manufactured in India by Bharat Biotech [11,12]. Later in April 2021, third vaccine; Sputnik V that was developed by Russian Moscow's Gamaleya Institute was also approved [11,12]. In addition Cadila healthcare began viral vector and a DNA plasmid vaccine development in March 2020 and held early phase 3 trials human trials of its vaccine candidate ZyCoV-D which is expecting to receive emergency authorisation by June 2021 [13]. Also Hyderabad-based Bharat Biotech, in collaboration with US based FluGen, begun first phase clinical trials of its nasal vaccine candidate in late-2020 [14]. India began administration of COVID-19 vaccines from 16 January 2021 with 3,006 countrywide vaccination centres, and as on 13 May 2021, India has administered 178,296,882 doses, (including first and second doses) of currently-approved vaccine candidates, Covishield and Covaxin [15].

In the first phase of vaccination drive health workers and frontline workers including police, sanitation workers, disaster management volunteers and paramilitary forces were scheduled to receive vaccine. While in the second phase residents over the age of 60 or residents between in the age group of 45 and 60 with one or more qualifying comorbidities were scheduled to receive the vaccination dose [11,12,15]. In addition to these as of 10 March 2021, India distributed over 58 million vaccine doses to 65 nations through its "vaccine maitri scheme" [16]. Despite of these until 1 March 2021 only 14 million healthcare and frontline workers were vaccinated. On the first day of vaccination drive in India only 165,714 people were vaccinated [15]. Some of the factors that limited the COVID-19 vaccination initiative resulting in low turn of general public included difficulties in registering online and technical problem with software, vaccine safety concerns, misinformation etc. In the first three days of vaccination 0.18% reported side-effects and only nine people (0.002%) were admitted to hospitals for observation and treatment [15].

In the midst of vaccination drive against COVID-19 initiated by Indian Government, vaccine hesitancy is one of the greatest hurdles faced by the regulatory authorities of India. Current survey is an attempt to understand the mental thought process of general public from the Ahmedabad district of Gujarat state in India related to COVID-19 vaccination. The survey would not only help in understanding the factors limiting the vaccination process in India but would also aid the regulatory agencies and medical fraternity of India to take necessary steps to eliminate the misconceptions and fear prevailing among Indian population to make the vaccination drive successful. As vaccination is the only hope for health and wellbeing of entire human race against COVID-19 pandemic which applies the motto no one is safe until we are all safe.

Methods

Survey population, location and duration

Current survey was conducted among the general public of more than 18 years of age, residing in Ahmedabad district of Gujarat State in India. The survey was conducted for duration of one month from March 2020 to May 2020 during the initial phase of COVID-19 vaccination process.

Survey question, data collection and statistical analysis

The questions used in survey were framed and extracted based on previously published studies conducted to assess psychological perspective of people following COVID-19 vaccination and based on preliminary discussion with local residents of Ahmedabad district. Modifications were made to generate study questions more relevant to context of understanding basic thought process of general public related to COVID-19 ' which in turn would assist the medical and regulatory fraternity in making the vaccination drive in local vicinity more successful. Questionnaire was prepared using Google forms and link was forwarded to over 500 people residing in the urban as well as rural areas of Ahmedabad district. The personal details of all participants were kept anonymous. Wide ranges of questions including demographic details of participants to their views about the currently available COVID-19 vaccines and their future perception regarding COVID-19 vaccines or vaccination process to be implemented were included in survey (Table 1). Collected responses were calculated as percentages using Microsoft Excel and were correlated with demographic data. Statistical analysis of the collected data was performed using SPSS 21.0 (statistical package for social sciences, Chicago, Illinois, United States), $p<0.05$ was considered as statistically significant difference.

Table 1: Survey questionnaire.

Survey Questionnaire
Were you infected prior to vaccination?
Myths heard about vaccines?
What sources of information regarding COVID-19 or vaccination are reliable?
Source of motivation for getting vaccinated.
Mental status before vaccination.
Vaccinated with?
Preferred site for vaccination?
Side effects seen after vaccination.
Satisfaction level post vaccination.
Perception regarding effectiveness of vaccine.
Preferred route for vaccination?
What mode/mechanism of immunity boost through, vaccine you rely the most?
What do you think, is the effective management strategy against COVID-19 infection?
Age group you think should be vaccinated on priority basis?
Willingness to take second dose of the vaccine.
Hurdles faced during vaccination
Reasons for not getting vaccinated till date

Bias eradication

Potential reasons of bias in such type of survey would be manipulation in views due to influence of closed relatives, other family members or friends participating in the survey. Attempts were made to eliminate mentioned potential reason of biasness by including only one per person per family to participate in the survey. Participation of people residing in closed vicinity (radius of 500 sq meters) was allowed only after maintaining a time lapse of minimum 7 days. Also, the probable cause of biasness generated because of getting the questionnaire filled by other resources due to language barriers (particularly in urban areas) was eliminated by generating the same set of questions in local language.

Results

India has not only successfully distributed locally but also imported indigenously manufactured vaccine doses to several countries across the world. In the midst of vaccination drive against COVID-19 initiated by Indian Government, vaccine hesitancy is one of the greatest hurdles faced by the regulatory authorities of India. Current survey is an attempt to understand the mental thought process of general public from the Ahmedabad district of Gujarat state in India related to COVID-19 vaccination. The demographic data of current survey conducted on 500 participants of Ahmedabad district of Gujarat state in India revealed that majority of participating population were in the age group ≥46 years, followed by participants in age group of 26-35 years (Table 2). Males readily participated in the survey compared to females. Business was the profession of majority of participants 226 (45.20%), followed by service 123 (24.46) (Table 2). It was observed that residents from the urban areas participated more willingly in the survey in comparison to the rural population (Table 2).

Table 2: Distribution of participants with reference to demographic details (n=500).

Parameters	N	%	Statistical Significance	
			$\chi 2$	P value
Age group (years)				
18-25	75	15.04	28.28	0.00003164
26-35	124	24.84		
36-45	108	21.55		
≥46	193	38.57		
Gender			4.25572	0.03912
Males	282	56.3		
Females	217	43.4		
Others*	1	0.3		
Profession			54.6427	0
Service	123	24.6		
Business	226	45.2		
Homemaker	67	13.4		
Student	84	16.8		
Residential locality			37.452	0
Urban Ahmedabad	345	69		
Rural Ahmedabad	155	31		

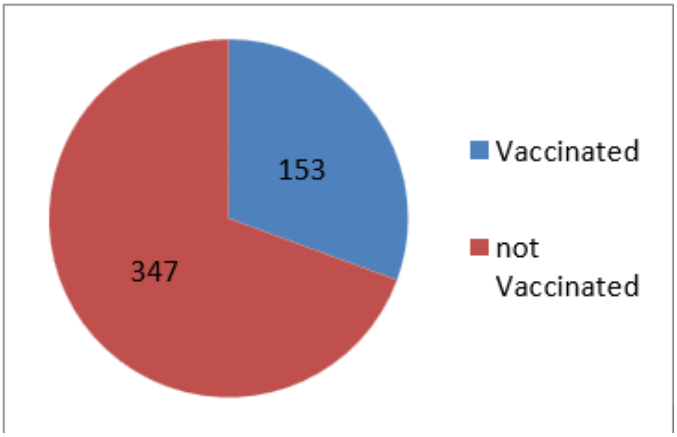

Figure 1: Distribution of participants on the basis of vaccination (n=500).

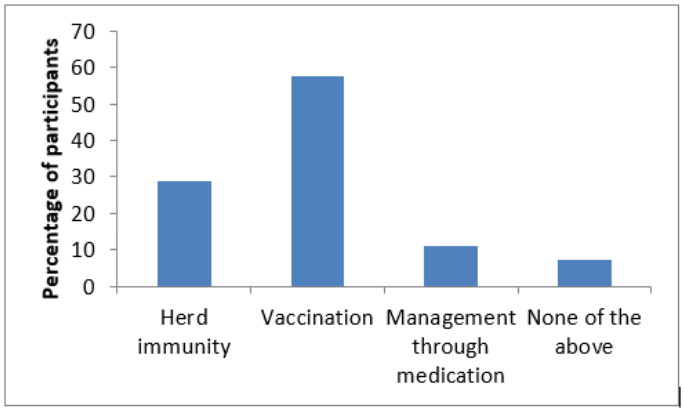

Figure 2: Perception of people for effective management of COVID-19 infection (n=500).

It was observed through the results of current investigational survey that out of total 500 participants 153 participants were already vaccinated with the first dose of either Covishield or Covaxin vaccines (Figure 1). Majority of the participating population believed that vaccination followed by herd immunization are the effective methods for the management of COVID-19 (Figure 2). Current survey findings revealed that out of 153 study participants 135 were vaccinated with Covishield. Amongst vaccinated participants almost 19% of survey participants were infected with coronavirus prior to vaccination. 129 out of 153 participants who were vaccinated revealed that they were self motivated for vaccination (Table 3). Media, news paper and local news were considered to be the most reliable sources for getting information against COVID-19 or vaccination process (Table 3). 99% of vaccinated study participants revealed that the most heard myth regarding vaccination was that corona virus infection would not occur after vaccination followed by the myth that there was no need of taking precautions after vaccination. 71% of vaccinated study participants believed that vaccination is the effective way of managing COVID-19 (Table 3). 93% of the vaccinated survey participants were unaware of the mechanism or mode of action of COVID-19 vaccines. 81% of vaccinated participants revealed that they were mentally prepared for getting vaccination whereas 19% of the vaccinated participants were either in dilemma or scared before receiving vaccine (Table 3). Majority (66%) of the vaccinated survey participants complained of headache and body ache symptoms after vaccination (Table 3). Majority of vaccinated study participants revealed registration process and unavailability of nearby vaccination centre as the biggest hurdles in COVID-19 vaccination (Table 3).

Table 3: Facts and perception amongst vaccinated participants (n=153).

Facts/perception	N	%	$\chi 2$	P value
Vaccinated with				
Covishield	135	88.23	52.3951	0
Covaxin	18	11.77		
COVID-19 infection prior to vaccination				
Yes	29	18.96	32.6394	0
No	124	81.05		
Sources of motivation for getting vaccinated				
Self-driven	129	84.31	110.097	0
Referral from peers	12	7.85		
Political driven	5	3.27		
Social pressure	7	4.57		
Reliable sources of information prior to vaccination				
Internet (search engines)	27	17.64	14.405	0.002403
Media/newspaper/local news	69	45.1		
Referral from another peers	24	15.7		
Social media	33	21.56		

Myths heard about COVID-19 vaccination				
No need to take precaution after vaccination	135	88.23	19.4218	0.000224
Infection will not occur after vaccination	152	99.34		
Covishield is more effective than Covaxin or vice versa	102	66.66		
Severe side effects or death may develop after vaccination	49	32.02		
Perception regarding effectiveness of vaccine				
Effective	109	71.24	49.5173	0
Temporary effective	32	20.91		
Effective for long duration	12	7.84		
Mode/mechanism of immunity boost through vaccination you rely the most				
m-RNA/S-Protein/DNA vaccine	35	22.9	50.2155	0
Live attenuated viral form	9	5.9		
Inactivated virus vaccine	16	10.45		
No information/not sure	93	60.75		
Mental state before vaccination				
Prepared	81	52.94	54.5266	0
Strongly prepared	53	34.64		
Dilemma	14	9.15		
Scared	5	3.27		
Preferred site for taking vaccine dose				
Government hospital	31	20.26	19.6625	0
Private hospital	31	20.26		
Civic centers	73	47.71		
At door site	18	11.76		
Side effects after vaccination				
Body ache/headache	66	43.14	44.7125	0
Fever/injection site pain	59	38.57		
Nausea/dizziness	3	1.96		
None of the above	25	16.33		
Satisfaction level with vaccination/vaccination process				
Extremely satisfied	36	23.52	48.6718	0
Moderately satisfied	18	11.76		
Satisfied	91	59.47		
Not satisfied	8	5.25		
Hurdles faced during vaccination				
Registration process	140	91.5	55.1921	0
Availability of nearby vaccination site	125	81.69		
Improper management at vaccination site	40	26.14		
No assistance by medical/supporting staff at vaccination centre	20	13.07		
Preferred route of vaccination				
Nasal	11	7.18	78.9122	0
Injectables	9	5.88		
Oral	115	75.16		
Transdermal	18	11.78		

Willingness to take second dose of the vaccine				
Yes	121	79.28	91.2719	0
Most probably	10	6.7		
Not sure	15	9.8		
No	7	4.5		
Age group you think should be vaccinated on priority basis				
Up to 15	4	2.61	83.175	0
16 – 30	14	9.15		
31 – 45	20	13.08		
Above 46	115	75.16		

Results of the current survey findings revealed that amongst 347 (69.4%) out of 500 survey participants who were not vaccinated 23.63% were already infected with coronavirus (Table 4). Maximum of non vaccinated survey participants (57%) believed on local news and newspaper as the reliable sources of information against COVID-19 or vaccination process. 21% of the non vaccinated survey participants had a misconception that vaccination may lead to severe side effects or even death and 56% of the non vaccinated survey participants were either totally unaware or had very little information about the corona virus vaccines. Almost 70% of the non vaccinated participants were either not prepared, were in dilemma or were scared of taking vaccines. Non availability of vaccines at the door steps, no surety about the effectiveness of vaccines and user unfriendly registration process were cited as the most prominent hurdles for not taking vaccines till date. Majority of the study participants preferred oral and transdermal as preferred routes for taking vaccination over injectables (Table 4).

Table 4: Facts and perception amongst participants who were not vaccinated (n=347).

Facts/Perception	N	%	χ^2
Infected with COVID-19			
Yes	82	23.63	51.861
No	265	76.36	
What sources you rely for COVID-19 or vaccine related information			
Internet (search engines)	37	10.66	77.4594
Media/newspaper/local news	198	57.06	
Referral from another peers	50	14.4	
Social media	62	17.86	
Perception about COVID-19 vaccination			
No need to take precaution after vaccination	27	7.78	83.7051
Infection will not occur after vaccination	50	14.4	
Vaccination leads to severe side effects or death	75	21.61	
No information	195	56.2	
Willingness for vaccination			
Prepared	100	28.81	18.3742
Not prepared	47	13.54	
Dilemma	120	34.58	
Scared	80	23.05	
Reasons for not getting vaccinated till date			
Registration process	180	51.87	37.2204
Non availability of vaccine at door step	259	74.63	
Not sure regarding the effectiveness	245	70.6	
Fear of adverse conditions or side effect	90	25.93	
Preferred route of vaccination			

Nasal	58	16.71	9.64233
Injectables	80	23.05	
Oral	111	31.98	
Transdermal	98	28.24	

Discussion

Analysis of current investigation revealed that majority of the survey participants were from the age group ≥46 years. It was observed that people in age group of 18-46 years were comparatively more reluctant to participate in survey due to cited reasons like; occupied with professional activities, frustrated and depressed due to socioeconomic burden created by COVID-19 or due to lack of proper and reliable information. It was seen that participants in age group of more than 46 years; particularly participants running their own business were not only more supportive to spread awareness but were comparatively more updated regarding COVID-19 or vaccination information as they spent relatively more fraction of their daily time in updating their information from reliable local media sources. It was observed that female participants; particularly the homemakers hesitated to participate in the survey citing the reasons that either they had no or very little information regarding COVID-19 or vaccination process or because they were highly dependent on male members of the family and had no independent opinion. Population from the urban regions of the district were more willing to participate in the survey compared to the rural regions because of reasons like lack of reliable information due to non availability of suitable resources or inability to access resources to get reliable information. Interestingly the population from rural regions were curious and asked several questions during the survey to update their information in context to COVID-19 and vaccination process.

It was observed that majority of vaccinated survey participants were vaccinated with Covishield, the reason being Covishield was the only available vaccine at the Government vaccination cites. Majority of the vaccinated survey participants were not infected with coronavirus prior to vaccination and revealed that they were self motivated and believed that vaccination would protect them from infection severity. Some of the vaccinated participants also cited social, political or strong recommendations from peers as reasons for getting vaccinated. Majority of survey participants irrespective of whether they were vaccinated or not believed local media (news papers and television news) as the reliable sources of information pertaining to COVID-19. Most of the survey participants revealed their mistrust towards information obtained through internet search engines or social media. Majority of vaccinated survey participants believed that myths they have mostly heard related to COVID-19 vaccines were; infection would not occur after vaccination, there is no need of precautions after vaccination and Covishield is more effective over Covaxin or vice a versa. All the vaccinated survey participants strongly believed that available vaccines were effective against COVID-19 in terms of reducing the severity of symptoms. It was observed that majority of vaccinated survey participants were unaware of the mechanisms by which the vaccines work against infection, but at the same time they were curious to know the same. Majority of vaccinated participants reported headache and body ache as most common symptoms post vaccination for which they were mentally prepared, participants revealed that they were satisfied after vaccination and are strongly willing to take the second dose of the same. Most common hurdles cited by vaccinated participants of the survey were; online registration process and unavailability of vaccination centers at nearby sites. Majority of study participants irrespective of whether they were vaccinated or not revealed that they would prefer oral followed by transdermal routes over injectables as the preferred way of taking vaccines.

Majority of non-vaccinated survey participants were no infected with coronavirus until the survey. Most of the non-vaccinated survey participants were either in dilemma, scared or unwilling to take vaccine due to common perception that vaccination would lead to severe side effects or even death. Almost 60% of non-vaccinated survey participants were either totally unaware or had very little information related to corona virus vaccines. Majority of the non-vaccinated survey participants believed that unavailability of the vaccines at their doorsteps, unsurety regarding the effectiveness of vaccine and unfriendly registration process were the prominent reasons for them for avoiding vaccination. It was strongly felt during the survey that major reason for vaccine hesitancy amongst the people of both urban and rural localities was unawareness leading to several misconceptions. It was also observed that people irrespective of urban or rural localities were curious to get information related to COVID-19 and vaccines and their response as well as belief was observed to be more stronger when the information was delivered to them in person rather than through social media, internet or even local media alternatives like newspaper or television news.

Conclusion

Through current survey findings authors strongly recommend to train young individuals locality wise (specifically in rural areas), who can disseminate reliable and correct information in their community/locality regarding COVID-19, its prevention, management and treatment; in addition to importance and benefits of vaccination. This would greatly aid in removing prevailing mis concepts regarding COVID-19 or vaccination and in turn help in removing the hesitancy of people towards vaccination which is the need of the hour for the betterment of entire human race.

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