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Original Research Article

A prospective survey to determine the general awareness and knowledge on COVID vaccinations among general public attending the vaccination clinic under a tertiary care hospital

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ABSTRACT

Background: The global impact of COVID pandemic has been unprecedented and had expedited the urgent need of mass vaccination especially in a densely populated country like India. Sustained efforts in strategies for increase the vaccination campaigns are essential at the community level to address the acceptance of vaccines. The perception of public understanding on COVID vaccinations would help healthcare professionals advise the public on vaccination and guide policy decisions. The aim of the study was to discover knowledge gaps related to various aspects of COVID vaccination among the general population and enhance awareness that improves the vaccination practice.
Methods: A semi structured questionnaire was administered exploring the knowledge and awareness of public was conducted in a tertiary care centre located in southern part of India. The study participants were contacted during the time of vaccination. The key domains we collected from our survey included general perception on vaccines, knowledge on vaccine practice, vaccination practices on special population, vaccine specific knowledge and vaccine related socio-cultural factors on vaccinations.
Results: Valid and complete responses were obtained from 4471 participants, among this majority were female participants (61.04%) with the median age of 36 years. Majority of the participants had a belief that vaccines are effective 3415 (81.8%) for preventing COVID-19.
Conclusions: Vaccination campaigns must consider strong public participation and contextually relevant communication tactics for the better acceptability. Furthermore, we need a targeted capacity building initiative with more emphasis towards vulnerable populations to be implemented on vaccination.

Keywords: COVID-19, Vaccination, Pandemic, Vaccine hesitancy

INTRODUCTION

The COVID 19 pandemic has resulted in a devastating impact across the globe, ever since the first case was announced in December 2019, Wuhan city, China. Majority of the countries had initially adopted a strategy to reduce the transmission of the disease by using non pharmaceutical interventions including enforcing usage of masks, hands sanitization, social distancing, travel restrictions, and partial or complete lockdowns [2]. The global scientific community reaches to a conclusion that vaccination is the most effective way to combat the pandemic through mass vaccination of population around

the world. Vaccinations have been the best method to control the rapidly spreading infectious diseases over decades. However, some of the groups initiated the process of spreading rumours and conspiracy theories against vaccination, which eventually leads to increase in burden on the existing healthcare system.[3] The concern about vaccine hesitancy is growing worldwide, which prompted the world health organization (WHO) to declare it as one among the top 10 health threats in 2019.[4,5] In low middle income countries, where the resources are limited, relevant stakeholders such as the Governments, public health officials, and advocacy groups must be prepared to address the issue of vaccine hesitancy and thereby enhance the vaccine acceptance rates. Various factors including historical, socioeconomic, cultural, ecological, health system/institutional, and political factors such as lack of trust to the government contribute to vaccine acceptance or refusal among the population.[6]

We have been witnessing the high transmissibility associated with the Delta strain, India saw a second wave of pandemic, impacting millions of individuals. Apart from that, a number of issues have been raised, including decreased neutralisation of some approved vaccines. This has resulted in the emergence of breakthrough infections.[7]

In developing countries, governments completely or partially control all the activities which promote, restore and maintain health, since they are considered as the primary funders, mainly focuses primary care by implementing various health-care programmes and policies. This mainly involves promoting population level public health activities through social and community mobilization and provision of treatment through hospitals and clinics in public sector.[8] The governments must ensure that the large scale equitable access and distribution of vaccines to everyone irrespective of any socioeconomic barriers. Community mobilization campaigns should also explain the level of effectiveness of a vaccine, the time it takes to achieve protection, and the importance of population-wide inoculation with the COVID-19 vaccine to achieve herd immunity. [9,10]

In India it's the private sector who has taken the lead over public in terms of providing the healthcare and similar practice seen in the case of vaccination but it remains unregulated. The governments therefore should engage and collaborate with all relevant national agencies and non-governmental organizations to achieve sustainability of vaccination especially in low middle income countries (LMICs). A reliable and transparent surveillance system and coherent industrial, trade and public health policies are key determinants for sustainability. A combined approach includes political commitment from the government by facilitating more collaborative research and promotes stimulation of evidence based demand and vaccine uptake. All these necessitates the requirement of generating a public private partnership model in this context of healthcare seeking behaviour among the population in India. The study was aimed to determine the key sociocultural beliefs and knowledge factors in vaccine enthusiastic population attending a public private partnership (PPP) model vaccine clinic could identify key aspects of knowledge that could serve as drivers of vaccine enthusiasm and identify opportunities for improvement.

METHODS

Participation and procedure

All adults (>18 years) attended the vaccination clinic from February to June 2021 were undergoing vaccination and willing to participate in the survey were enrolled. A trained healthcare staff was involved in administering a printed form of the questionnaire before the administration of vaccination. Post the administration of knowledge attitude and practice (KAP) survey, the recipients would be given the opportunities to obtain counsel regarding vaccine use. They would be also generally motivated to spread awareness on vaccination practices.

Measures

A semi-structured questionnaire was designed that included 25 questions spanning 5 major themes: 1. General perception on vaccines 2. Knowledge on vaccine practices 3. Vaccination practices on special population 4. Vaccine specific knowledge 5. Socio-behavioural aspects. The data was later populated into a spreadsheet format and analysed.

Statistical analysis

Descriptive statistics would be used to describe the in terms of mean and SD with 95% confidence. All statistical analysis was conducted using the statistical software (IBM SPSS 23.0).

RESULTS

The baseline characteristics of study participants are presented in (Table 1). A total of 4471 participants with a median age of 36 years (IQR 25-56) consented for the survey over a period of 5 months. The study cohort primarily constituted healthcare workers (61.9%) with a predominance of female participants (61.04%). Health care workers included physicians (20%), nurses (15%), paramedical staffs (6%), students and interns (23.4%) and other health care workers (32%). Blood group Blood group assessments revealed A positive blood group to be the most common (18.9%).

General perception on vaccines

On assessing general perception on vaccines 81.8% among 4175 respondents with recorded responses believed that vaccine is effective in preventing covid-19

diseases, the results are represented in (Table 2). About 83% of samples have the thought that it is normal to get fever, headache and fatigue after vaccination, whereas 11% of the participants were not aware of this aspect. Among the respondents, 68.14% were sure that they will not contact COVID-19 due to vaccine, while 21.51% don't know about it.

Table 1: Baseline characteristics of the study participant.

Baseline characteristics	Frequency (%)
Age (Mean±SD)	(18±41)
Age group (years)	
≤40	2383 (53.30)
41-60	1003 (22.43)
61-80	810 (18.12)
>80	53 (1.19)
Unknown	222 (4.97)
Gender	
Male	1640 (36.68)
Female	2729 (61.04)
Unknown	102 (2.28)
Blood group	
A+	845 (18.90)
A-	64 (1.43)
AB+	207 (4.63)
AB-	24 (0.54)
B+	974 (21.78)
B-	74 (1.66)
O+	1464 (32.74)
O-	127 (2.84)
Unknown	692 (15.48)
Profile	
Health care workers	2769 (61.9)
Public	1702 (38.1)
Designation	
Physicians	553 (12)
Nurses	413 (9.2)
Paramedical	270 (6)
Students and interns	650(14.5)
General people	1000(22.3)
Other healthcare workers	883(19.7)
Unknown	702(15.7)

Almost all except 0.46% of participants were aware that COVID-19 vaccine is used against viruses. 73.36% of respondents indicated that it is not possible to give up preventive measures (mask, sanitizer, social distance etc.) after vaccination. Large proportion (79.21%) of the participants agreed that it is mandatory to have same vaccine in the second dose.

Knowledge on vaccine practice

Few survey questions were asked to assess participant's knowledge on current vaccine practice results are presented in (Table 3). Covishield was the only available vaccine in our hospital settings during survey period. A large proportion (above 80%) of sample populations has a good knowledge on currently available vaccine and its dosing schedule. 91.9% respondents have a good understanding about the number of doses need to be taken and 85.57% respondents knows that minimum of 28 days duration is required between first and second dose vaccination of covishield.

Table 2: General perception.

Characteristics of participants	N	%
General perception		
Do you believe the vaccine is effective in preventing COVID-19?		
Total attendees	4175	93.38
Yes	3415	81.80
No	165	3.95
Don't Know	595	14.25
Do you think it is normal to get fever, headache and fatigue after vaccination?		
Total attendees	4273	95.57
Yes	3549	83.06
No	253	5.92
Don't know	471	11.02
Due to vaccine, can I get COVID-19?		
Total Attendees	4291	95.97
Yes	444	10.35
No	2924	68.14
Don't Know	923	21.51
COVID-19 vaccine is against?		
Total Attendees	4357	97.45
Virus	4337	99.54
Bacteria	16	0.37
Protozoa	1	0.02
Others	3	0.07
Is it possible to give up preventive measures (mask, sanitizer, social distance etc.) After vaccination?		
Total attendees	4186	93.63
Yes	829	19.80
No	3071	73.36
Don't know	286	6.83
Is it mandatory to have the same vaccine in the second dose?		
Total attendees	4117	92.08
Yes	3261	79.21
No	262	6.36
Don't know	594	14.43

Vaccination practices on special population

The survey questions on vaccination practices on special population are presented in (Table 4). 76.79% of survey subjects who had recorded a response are aware that

vaccine can be administered to a COVID recovered case while about 15.15% admitted ignorance on whether the vaccine can be administered to a covid recovered patient.

Table 3: Observation on the knowledge on vaccine practice.

Knowledge on vaccine practice	N	%
How much doses of vaccine should be taken?		
Total attendees	4257	95.21
One dose	272	6.39
Two doses	3912	91.90
Three doses	36	0.85
Four doses	37	0.87
Minimum duration between the first and second dose?		
Total attendees	4325	96.73
28 Days	3701	85.57
1 Month	360	8.32
3 Month	255	5.90
1 Year	9	0.21
At what site is the vaccine to be taken?		
Total attendees	4280	95.73
Right hand	308	7.20
Left hand	3738	87.34
Buttocks	34	0.79
Don't know	200	4.67
Should the site be rubbed after vaccination?		
Total attendees	4240	94.83
Yes	288	6.79
No	3582	84.48
Don't know	370	8.73
Does the injection site need to be heated to relieve pain?		
Total attendees	4222	94.43
Yes	111	2.63
No	3484	82.52
Don't know	627	14.85
After vaccination, how long need to be monitored in vaccination site?		
Total attendees	4260	95.28
5 minutes	175	4.11
15 minutes	247	5.80
30 minutes	3767	88.43
1 hour	71	1.67

Among the respondents, majority believed vaccine can be administered within 4 weeks of recovery from COVID. Regarding the administration of vaccine among cancer patients, almost half (51.5%) of the respondents believed that cancer patients can receive vaccine while 19.3% of the respondents were of the belief that vaccines cannot be administered to cancer patients. About 59% of the respondents believed pregnant and breast-feeding women would not be able to take vaccine. About 10% of the respondents believed the lower age cut-off for receiving vaccine is 10 years while half of the respondents (51%) believed that vaccine can administered to people above 18 years.

Table 4: Vaccination practices on special population.

Vaccination practices on special population	N	%
For a COVID recovered case can the vaccine be taken?		
Total attendees	4093	91.55
Yes	3143	76.79
No	330	8.06
Don't know	620	15.15
How many weeks following recovery from COVID, vaccination can be given?		
Total attendees	3685	82.42
1 Week	500	13.57
4 Week	1821	49.42
2 Month	754	20.46
3 Month	610	16.55
For patients with underlying disease like cancer, can the vaccine be taken?		
Total attendees	4041	90.38
Yes	2083	51.55
No	783	19.38
Don't know	1175	29.08
For breast feeding/pregnant can the vaccine be taken?		
Total attendees	4073	91.10
Yes	681	16.72
No	2402	58.97
Don't know	990	24.31

Vaccine specific knowledge

The survey questions on vaccine specific knowledge are presented in (Table 5). Among the respondents, 30.6% believed that the COVID vaccine being administered was a 'killed vaccine' while 19.2% believed it was a mRNA based vaccine. About 28.6% admitted that they were not sure about the type of vaccine. Covishield was recorded by 83% of respondents as the Covid vaccine that has been administered to them before. Regarding the choice of vaccines, 32% and 24.8% of respondents expressed their interest in receiving Bharat Biotech vaccine and Oxford-Serum Institute vaccine respectively. About 43% and 37% marked the level of protection offered by the vaccines to be at 70% and 80% respectively.

Vaccine related socio-cultural factors

The survey questions on vaccine related socio-cultural factors are presented in (Table 6). 1380 (33.75) of the vaccines expressed disturbance with the negative propaganda in the social media. Majority of the cohort believed that vaccine can end the pandemic, however 3% (N=118) and 2.5% (N=104) believed the contrary and

were not sure about the role of vaccines in ending the pandemic respectively.

Table 5: Vaccine specific knowledge.

Vaccine specific knowledge	N	%
What's the type of vaccine which we are using?		
Total attendees	3871	86.58
Live vaccine	847	21.88
Killed vaccine	1185	30.61
mRNA vaccine	745	19.25
Don't know	1094	28.26
What's the name of the vaccine you have been administered last time?		
Total attendees	3760	84.10
Covishield	3124	83.09
Covovaxin	279	7.42
Covaxin	104	2.77
Pfizer vaccine	253	6.73
If you had a chance to get any of the following vaccines, which one would you choose?		
Total attendees	3860	86.33
US (Pfizer vaccine)	731	18.94
UK-India (Oxford-Serum Institute vaccine)	959	24.84
India (Bharat Biotech vaccine)	1236	32.02
Russia (Sputnik V vaccine)	117	3.03
Available vaccine	817	21.17
Level of protection expecting after complete vaccination?		
Total attendees	4058	90.76
50	442	10.89
70	1740	42.88
90	1492	36.77
100	384	9.46

Inspiration from healthcare workers, social media and work place related requirements were the major drivers for vaccination expressed by the respondents. Among the individuals with negative attitude towards motivating others for vaccination, healthcare workers constituted 65% (186/286). 10% (N=434) reported non affirmative answer to the same question in total in the cohort. 89.5% (N=3702/4136) of the respondents believed that they would motivate others to take the vaccine.

DISCUSSION

For understanding the epidemiological dynamics of disease control of COVID, as well as the effectiveness, compliance, and success of the COVID vaccination campaign, it's necessary to capture the local population's knowledge, attitudes, and practises (KAP) about the COVID-19 vaccine. The awareness on vaccination analysed in this study was based on 5 key themes such as General perception on vaccines, knowledge on vaccine practice, vaccination practices in special population, vaccine specific knowledge and vaccine related socio cultural factors which have been identified and showed a high degree of awareness.

Table 6: Vaccine related socio cultural factors.

Sociobehavioral aspects	N	%
Motivate others to take vaccine?		
Total attendees	4136	92.51
Yes	3702	89.51
No	286	6.91
Don't know	148	3.58
Have you been disturbed by the negative news / references spread against vaccination on social media?		
Total attendees	4087	91.41
Yes	815	19.94
No	2707	66.23
To an extent	565	13.82
Vaccination has a major role to play, to end the COVID-19 pandemic- do you agree with the statement?		
Total attendees	4105	91.81
Agree	3248	79.12
Partially agree	635	15.47
Disagree	118	2.87
Not sure	104	2.53
Who inspired to take the vaccine?		
Total attendees	4078	91.21
Social media	768	18.83
Healthcare worker	1977	48.48
Head of the department	575	14.10
Friends & relative	404	9.91
Others	354	8.68

In this study, majority of the participants (81%) perceived that Covid vaccination could prevent COVID-19 infection and the remaining participants were aware about the vaccination in terms of number of doses to be consumed and importance of continuous usage of masking and social distancing. The findings are consistent with the study conducted in China, the COVID-19 vaccine acceptability rate was found to be more than 90%.[11] The majority of cross-sectional surveys conducted around the world have yielded similar results.[12-14] The study participants (85.57%) had a good understanding about the dose interval between the first and second dose of the vaccination. Since there was a change in the policy by Government of India on the time gap between the two doses of covishield vaccine, we observed some confusion among some participants regarding the duration. Earlier the time gap was 4 weeks, then it was changed subsequently into 6-8 weeks and 12 weeks. In the current study more than half (51.55%) of the participants opined that they would prefer to undergo covid vaccination despite having certain chronological diseases such as cancer, however 19% reported "no" to

vaccination and 29% remarked they are unaware about this scenario. Previous studies have characterised the looming issue of vaccine hesitancy in India, about 80% of the cancer patients had not taken a single dose of vaccination and the reason for not being vaccinated could be due to vaccine hesitancy (77%).[15] The possible discrepancy might be due to the difference in study population and the setting. We found a significant lack of awareness in the vaccine and vaccination knowledge on special populations such as pregnancy, breast feeding, patients with comorbidities such as malignancies, transplant, and so on. This is a significant finding in the existing scenario where India has vaccinated the majority of its population and has taken the vaccination to the last mile, in this lap there has to be targeted education of these sub groups which would aid in greater penetrance of the vaccination and achievement of the herd immunity. Another important reason to target this group is that they are the vulnerable group and in the eventuality of the contraction of the disease these special groups have a higher propensity to progress to severe disease.

The present study could assist the policymakers to undertake proactive mobilization campaigns and well-designed strategies by highlighting the relevance of vaccination to the community and encouraging vaccine uptake and acceptance, to prevent further mortality and to reduce the spread of the pandemic**.** We also tried to determine the opportunities for improving vaccine education among general public. This will enable the government, creating effective strategies to build trust and confidence in COVID-19 vaccination by sharing practical information to increase the knowledge on vaccine, access to vaccines and also address the barriers to vaccination and myth busters. In this scenario partnerships that enable capacity building initiatives and information education and communication activities are needed to address vaccine hesitancy among the public. Potential strategies have to be recognized to include the promotion of good research governance, emphasis on the relevance of strategic partnerships to enable the access to new markets, the fostering of good networking and collaborations between the private agencies with the government organizations.

Our study setting was at the PPP clinic for vaccination, so the representation of vaccine hesitant group would have been underrepresented though being a major area of concern. The general literacy rate of Kerala is high and the study was conducted in an urban area, so it is quite likely that rural India might not share the same level of awareness. Since the study was conducted during the mid-phase of vaccination drive and the opportunity for the awareness on the vaccine knowledge is likely to be high during this period due to the high media coverage, nevertheless we believe that similar studies on vaccine awareness to be done in different part of the country and in every phase of the vaccination drive to help us identify the gaps in the KAP on vaccination, the insight will help the policy makers to roll out targeted strategies accounting for the regional differences.

CONCLUSION

A successful mass vaccination is always considered to be an effective public health tool to combat any pandemic. In the context of ongoing COVID pandemic, our study tried to determine the vaccine acceptance and hesitancy by assessing the key facilitators and barriers among the study population. A comprehensive survey on the general awareness, knowledge, among the public was conducted and we found that their knowledge regarding covid vaccination were adequate although a rapid vaccine development and implementation of vaccination drive by the government. The influence of dedicated healthcare workers, social media and other social mobilization campaigns have played a vital role in dissemination of knowledge on covid vaccination. Despite of few concerns in terms of safety of vaccinations among breastfeeding woman and population with severe chronic disorders, the overall response on awareness was positive among the public. Our study found majority of the people expressed their willingness to motivate others on the necessity of vaccination, this clearly highlights, usual anti-propaganda campaigns against the vaccines have not impacted much in the context of COVID-19.Although this is a cross sectional study indicating the snapshot of population in certain point of time, more longitudinal studies need to be conducted to understand the knowledge gaps and gain insights about their attitudes and concerns regarding the vaccine in light of India's evolving situation.

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