

Factors Affecting COVID-19 Vaccination Decision: Findings from an Online Survey from India

To the editor,

Scientists worldwide contributed to bringing out vaccines against Coronavirus Disease 2019 (COVID-19), which were then made available to citizens through an emergency use approval. However, there exists a lot of skepticism among the various stakeholders regarding the safety and efficacy of the vaccine^[1] despite the efforts by health authorities and governments to educate the citizens. Reports recommend using community support in vaccine policymaking, which presently remains just as a vision.^[2] Although there is an increase in the acceptance and coverage of COVID-19 vaccines, there are only a few reports on the individual motivation behind the uptake of these vaccines.^[3] Understanding the various factors and reasons that motivate the general public to opt for vaccination will help identify the strengths and gaps of the existing vaccine awareness campaign.^[4]

A web-based cross-sectional survey was conducted using Google forms among all eligible adults (age ≥ 18 years) for COVID-19 vaccination in India from June 2, 2021–August 31, 2021. We used a survey instrument consisting of 16 questions in total; the first section consisted of 10 questions that included the consent and demographic details of the participants. The second part of the questionnaire had three questions that fetched vaccination status and co-morbidity status details. The third section had two questions that were designed to identify the motivation behind vaccination.

A total of 2,034 subjects from 27 different states/union territories of India participated in the study within the mean \pm standard deviation (SD) age of 35.37 ± 13.89 , of which 46.1% were male participants. The survey had at least one respondent from 27 states/union territories out of India's 36 states/union territories. Most respondents were vaccinated with the first dose (56.4%) or the first and second doses (24.5%). Around 66.3% of participants reported that they took the Covishield vaccine. Adherence to government guidelines was the motivation behind vaccination of 24.5% of respondents, whereas 20% of respondents took the vaccine owing to the health benefits of the vaccine, 16% vaccinated because of fear of infection, and the remaining 39% respondents had different reasons as tabulated in supplemental Table 1.

Females are significantly less motivated for vaccination as compared to their male counterparts [OR 0.8; C.I 0.6 – 0.9, $P = 0.020$]. When the effect of all other factors such as socioeconomic status (SES), age, and marital status, were taken into account, the level of motivation was further reduced [OR 0.7; CI 0.5–1.8, $P = 0.001$]. The age of participants has

emerged as a key factor for the motivation of vaccination. Older adults between 40 and 65 years were more motivated to get vaccinated [OR 3.0; CI 2.3–4.1, $P < 0.001$]. A similar trend was observed [OR 3.8; CI 1.5–9.5, $P = 0.005$] for the geriatric population (age more than 65 years), compared to younger adults, aged 18 to 39 years.

We observed a consensus between the findings of univariate and multivariate analyses regarding the effect of age on motivation. Apart from smoking, our data did not show any statistically significant associations between SES, marital status, education, employment status, and prevalence of co-morbidities and motivation; however, smokers were more prone to vaccination [OR 1.8; CI 1.1–2.9, $P = 0.023$] in multivariate analysis in contrast to the borderline statistical significant finding of univariate analysis [OR 1.6; CI 0.9–2.5, $P = 0.050$].

We also explored the association between perceived motivational factors, SES, and education. SES and education were significantly associated (all $P < 0.001$) with three perceived motivation factors: fear of getting infected, adherence to government guidelines, and health benefit of the vaccine. Middle SES participants are more likely to experience all above three motivational factors than extreme SES, i.e., upper and lower. In addition, highly educated participants, i.e., participants with PG or higher degrees, are more expected to perceive all three factors (all $P < 0.001$) of motivation than their comparatively less-educated counterparts.

The responses to open-ended questions lead to five themes, viz., health benefits—safety measures, precaution, prevention, fear of infection, boost immunity, avoid complications, previous underlying illness—(62%), as a policy mandate—pre-requisite to attend schools, colleges, or join back to work or due to their work demand being a front line worker, travel mandate, medical procedures—(9%), social responsibility—protect one's family and citizens—(14%), not convinced with the vaccine benefits—harms, side effects, and beliefs regarding artificial immunity—(9%), and attaining normalcy (6%).

The present study was conducted to understand the factors that motivate individuals to take vaccination against SARS COV-2 infection identified in various exciting findings. The majority of our respondents (80%) received at least one dose of COVID-19 vaccination, which shows a positive trend in vaccination uptake. Following government guidelines, fear of infection and being convinced by the health benefits of vaccination were identified as the primary motivation behind immunization. Fears of getting infected were also reported

to be one of the most prominent motivators for vaccination. However, excess fear can be detrimental, leading to more health-related anxiety.^[5] Therefore, it is essential to upscale the knowledge dissemination related to COVID-19 to eliminate unwarranted concerns that may result in inadequate vaccination coverage.

Our data suggest that females are less motivated to take vaccination than their male counterparts, which is further linked to their economic, educational, and marital status. This indicates the need for gender-specific awareness programs that may increase the uptake of COVID-19 vaccinations. Concurring with the previous report,^[6] the present study also found that the older/geriatric population is highly motivated to take vaccination compared to the younger population. The inferences from this study necessitate the need for reaching out to the younger population with more effective strategies.

Respondents belonging to the middle-class strata of society and higher education status were highly motivated to take vaccination driven by fear of getting infected, adherence to government guidelines, or health benefits of the vaccine. This inference is identical to the multi-national survey conducted to appraise vaccine acceptance, showing that higher education and income are cardinal factors in increased vaccine acceptance.^[7]

Nearly 10% of participants reported that their motivation to vaccinate is indirect pressure from educational institutions, employers, or the government. Though the percentage of this population is considerably small, the reported motivations need careful evaluation, as these respondents are not self-motivated but undertook vaccination by a perceived force. This may potentially impact the vaccine coverage, as self-motivation or voluntary choice to take up vaccination is regarded as the best strategy over-emphatic vaccination.^[8] Similarly, 10% of the population did not accept the vaccine because of disbelief in vaccine efficacy or undue trust over natural immunity. This is more jeopardized by the existing vaccine conspiracy theories and misinformation.^[9] Policymakers may have to adopt a more transparent and inclusive approach to increase voluntary vaccine uptake, as vaccine resistance is reported to increase with compulsory vaccination.^[8]

The overall results depict an array of motivations behind vaccination. The majority were affirmative responses toward vaccine acceptance, and a few of them require policy-level interventions to make vaccination uptake a voluntary process. The results of this survey are essential in light of reported vaccine hesitancy among the general public and medical fraternities.^[1,10] There are demonstrable limitations in this study such as the survey respondents are those who know the English language, who got access to the internet, and who were aware of responding to a Google form. The limited sample size in this survey remains another limitation that questions the generalizability of results. Nevertheless, the insights from this survey may be helpful to design more inclusive,

informative, and population-centric vaccination campaigns that can overcome vaccine resistance and make vaccination a voluntary health program.

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Ethical approval

The study was approved by Institutional Ethics Committee of Sant Hirdaram Medical College via SHMCNYS/IEC/2021-22/P17/234.

Patient consent

All the patients signed a digital consent before participating in the study.

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Conflicts of interest

There are no conflicts of interest.

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Supplemental Table 1: Socio-demographic and clinical characteristics of study participants

Characteristics	Total n=2034
Age	35.37±13.89
Gender (Male)	938 (46.1)
Marital Status	
Married	1198 (58.9)
Unmarried	803 (39.5)
Preferred not to say	33 (1.6)
Socio Economic Status	
Lower Class	486 (23.9)
Lower Middle Class	688 (33.8)
Upper Class	260 (12.8)
Upper Middle Class	600 (29.5)
Education	
10 th	191 (9.4)
12 th	227 (11.2)
Less than 10 th	253 (12.4)
Ph.D.	33 (1.6)
Post graduate	498 (24.5)
Undergraduate	832 (40.9)
Employment status	
House makers	274 (13.5)
Others	345 (16.9)
Professional service	438 (21.5)
students	445 (21.9)
unemployed	83 (4.1)
Vaccination Status	
1 st and 2 nd dose both	498 (24.5)
1st dose	1147 (56.4)
None	389 (19.1)
Name of vaccine	
Covaxin	307 (15.1)
Covishield	1348 (66.3)
N/A	357 (17.5)
Others	22 (1.1)
Smoking	165 (8.1)
Co-morbidities	
Thyroid	78 (3.8)
Hypertension	125 (6.1)
Diabetes	85 (4.2)
Kidney Disease	10 (0.5)
Heart Disease	16 (0.8)
Cancer	4 (0.2)
Others	104 (5.1)
None	1612 (79.3)
One Co-morbidity	333/422 (78.9)
Two Co-morbidity	79/422 (18.7)
More than two Co-morbidity	10/422 (2.4)
Motivation behind vaccination (based on first response)	
Fear of getting infected	326 (16.0)
Adherence to government guidelines	498 (24.5)
Family pressure	68 (3.3)

Supplemental Table 1: Contd...

Characteristics	Total n=2034
Peer pressure	11 (0.5)
Health benefit of vaccine	412 (20.2)
Employer pressure	115 (5.7)
Government guidelines for travelling	62 (3.0)
Don't want to pose an harm to children in the family	62 (3.0)
Vaccine help in eradication of communicable disease	121 (5.9)
Because it is free of cost	4 (0.2)
My educational institute/university mandate vaccination to participate particular disease/exam	40 (1.9)
Fear of death	28 (1.3)
No specific reason	287 (14.1)
One reason behind motivation to vaccination	1213 (59.6)
Two reasons behind motivation to vaccination	379 (18.6)
Three reasons behind motivation to vaccination	193 (9.5)
More than three reasons behind motivation to vaccination	249 (12.2)

Contd...