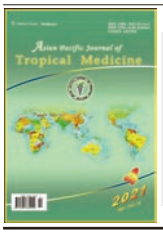

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Predictors of acceptance and willingness to pay for the COVID-19 vaccine in the general public of India: A health belief model approach

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ABSTRACT

Objective: To determine the predictors of acceptance and willingness to pay (WTP) for the COVID-19 vaccine among the Indian public and to provide insights for future demand forecasts and pricing considerations.

Methods: A nationwide, web-based, self-administered, cross-sectional survey was conducted from 5 to 20 October 2020. The health belief model (HBM) approach was used as a theoretical framework to assess the predictors of acceptance of and WTP for the COVID-19 vaccine.

Results: Of 2 480 respondents, 2 451 completed the online survey, yielding a response rate of 98.8%. Participants who participated in the survey had diverse demographics in terms of their location, educational level, occupation type, and family income. Among 2 451 respondents, the majority (89.3%) intended to receive the COVID-19 vaccine. Respondents with high perceived benefits of COVID-19 vaccination, such as reduction in worry (*OR* 5.87; 95% *CI* 4.39-7.96) and sickness (*OR* 4.31; 95% *CI* 3.31-5.62), showed higher intention to receive the vaccine. However, respondents with a high perception of the side effects and barriers to vaccination (*OR* 0.36; 95% *CI* 0.25-0.54) and vaccine shortage (*OR* 0.58; 95% *CI* 0.41-0.81) showed lower intention to receive the vaccine. The majority (2 162, 88.21%) of respondents were willing to pay an amount of INR: 500-1 000 or USD: 6.81-13.62 for a dose of COVID-19 vaccine, with a median (Q1, Q3) of INR: 500 (500, 1 000) or USD: 6.81 (6.81, 13.62). The higher marginal WTP for the COVID-19 vaccine was influenced by advanced age, marital status, female sex, intermediate educational background, high family income, fair or poor perceived health status, and no affordable barriers.

Conclusions: The majority of respondents intended to receive the COVID-19 vaccine. Healthcare interventions focusing on HBM constructs and demographic predictors associated with low intention to receive the vaccine can be effective in enhancing the coverage of the COVID-19 vaccine. The findings of this study provide guidance for the future price considerations of the COVID-19 vaccine.

KEYWORDS: Novel corona virus disease; Vaccination; Acceptance; Intention to take vaccine; Price; Cost

1. Introduction

Immunisation is one of the most successful and cost-effective healthcare intervention for preventing infectious diseases. Vaccination against COVID-19 can control and prevent COVID-19[1,2]. Various countries have fastened the research and development of COVID-19 vaccines. By 1 November 2020, a total of 44 and 154 candidate vaccines against COVID-19 were under clinical and preclinical evaluation, respectively[3]. The timely development and accessibility of a vaccine are not the only obstacles from the viewpoint of public health. Once a vaccine is developed, an adequate proportion of the public must be immunised to reach herd immunity and prevent additional spread in the community. The success of immunisation against COVID-19 is strongly linked to the acceptance of a

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vaccine by the public. Previous studies conducted in Australia, America, Greece, the United Kingdom, and France have reported an unsatisfactory acceptance rate of 17%-67% for vaccines against 2009 H1N1 influenza[4-10].

Studies adopting the health belief model (HBM) or protection motivation theory have indicated that the acceptance of pandemic vaccines is considerably affected by the risk perception of the disease, perception of the efficacy and safety of vaccines, history of vaccination, vaccination-related attitude of the public, recommendations of the doctors, price of vaccines, and sociodemographic characteristics[11,12]. Vaccine hesitancy among the public is a primary obstacle in promoting the acceptance of pandemic vaccines[13]. Even in high-risk populations, such as health workers, only 25% received the H1N1 pandemic vaccine when it was offered for free in Beijing and China[14]. Low- and middle-income countries should implement measures to ameliorate the hesitant attitude of the public for improving vaccine coverage. India is a middle-income country with a relatively low vaccine coverage and high vaccine hesitancy. By 1 November 2020 in India, three COVID-19 vaccines (Covaxin, Covishield, and ZyCoV-D) were under phase Ⅱ clinical trial evaluation[15]. Information regarding the public acceptance of and willingness to pay (WTP) for the COVID-19 vaccine is essential to evaluate the feasibility of the implementation of vaccination programmes when the vaccine is available in the market. In addition, this information can help obtain insights into future pricing considerations and demand forecasts for the COVID-19 vaccine. Therefore, in the present study, we determined predictors associated with the acceptance of and WTP for the COVID-19 vaccine by using the HBM.

On the basis of the HBM, we hypothesised that the acceptance of and WTP for the COVID-19 vaccine are considerably affected by the perceived susceptibility to COVID-19 infection, perceived severity of infection, perceived benefits of vaccination, and perceived barriers to accept vaccine among the public[16]. Other factors that might affect the intention to receive and WTP for the COVID-19 vaccine were also explored including the perception of health status, presence of chronic diseases, and infection of a close person with COVID-19.

2. Subjects and methods

2.1. Study design and ethical considerations

This study was designed as a cross-sectional, web-based online survey that was conducted for a period of 15 days from 5 to 20 October 2020. Because of limitations in performing face-to-face data collection during the current active COVID-19 outbreak in India, we conducted an online survey to gather responses from the public. The study protocol, survey tool, and informed consent process were approved by the RIPER Institutional Review Board before beginning the survey. No monetary incentive was provided to participants, and anonymity was maintained to ensure the confidentiality and reliability of data. This study was conducted online in compliance with the provisions of the Declaration of Helsinki regarding research on human participants.

2.2. Study participants

Both male and female Indian residents who were aged between 18 and 70 years and were willing to participate in the study by selecting 'yes' as the response for the first question (Are you willing to participate in this COVID-19 vaccine online survey?) were eligible for inclusion in this study. Foreign nationals and people who received the COVID-19 vaccine during clinical investigation were excluded from the survey.

2.3. Sample size and sampling

A single-population proportion formula was used to determine the number of participants to be included in this survey. By assuming a vaccine acceptance rate of 50%, a margin of error of 2% (95% *CI* 48%-52%), a power of 80%, and a design effect of 1%, we calculated a sample size of 2 395. By considering a nonresponse rate of 3%, the final sample size was estimated to be 2 467. Participants were recruited using a simplified snowball sampling technique, where participants invited in the survey were requested to pass the invitation to their known contacts.

2.4. Survey tool

The survey questionnaire consisted of four sections: 1) demographics, perceived health status, and COVID-19 experience; 2) intention to receive the COVID-19 vaccine; 3) HBM hypotheses; and 4) WTP for the COVID-19 vaccine.

2.4.1. Demographics, perceived health status, and COVID-19 experience

Information regarding the following demographics characteristics was collected from participants: age, sex, marital status, place of residence, education, occupation, and monthly family income. In addition, participants were queried regarding their overall health status; whether they had any type of chronic disease; and whether any of their friends, family members, neighbours, and colleagues were infected with COVID-19.

2.4.2. Intention to accept the COVID-19 vaccine

The intention to accept the COVID-19 vaccine was examined by including the following statement in the survey: If a vaccine against COVID-19 infection is available, I would get it. The responses to this statement were scored on a five-point Likert scale, where 1, 2, 3, 4, and 5 indicated strongly disagree, agree, neutral, disagree, and strongly disagree, respectively. Furthermore, the response of each participant was dichotomised, where a score of 1 was assigned to intending to receive vaccine (strongly agree/agree) and a score

of 0 was assigned to not intending to receive the vaccine (neutral/disagree/strongly disagree).

2.4.3. HBM hypotheses

Participants' belief regarding the COVID-19 vaccine was evaluated using the HBM hypothetical approach[17]. The section on the HBM consisted of questions assessing the perceived susceptibility to develop COVID-19 infection (four items), perceived severity of COVID-19 infection (five items), perceived benefits of COVID-19 vaccination (two items), perceived barriers to accept the vaccine against COVID-19 (five items), and cues to action (two items). Dichotomous responses (agree or disagree) were obtained for each item in this section.

2.4.4. WTP

Participants' WTP for the COVID-19 vaccine was examined by asking the following question: What is the maximum amount you are willing to pay for the COVID-19 vaccine per dose? The following six responses were provided for this question (INR: 500-1 000 or USD: 6.81-13.62, INR: 1 500-2 000 or USD: 20.42-27.23, INR: 2 500-3 000 or USD: 34.04-40.85). The aforementioned price ranges for the vaccine were based on the approximate current minimum to maximum prices of adult vaccines available in India.

2.5. Validation of the survey tool

An appropriately designed, self-administered survey form was prepared on COVID-19 vaccine and subjected for the assessment of content validity and reliability. Content validity was evaluated by a panel of experts comprising an epidemiologist, a physician specialised in infectious diseases, a scientist involved in vaccine research, an anthropologist, and a community health officer. A total of 20 questions (acceptance=1, susceptibility to develop COVID-19 infection=4, severity of COVID-19 infection=5, benefits of COVID-19 vaccination=2, barriers to accept the COVID-19 vaccine=5, cues to action=2, and WTP for the COVID-19 vaccine=1) were included in the survey tool. Expert opinion on the addition of each question or statement in the survey tool was obtained on a four-point Likert scale, with a score of 1, 2, 3, and 4 indicating strongly disagree, disagree, agree, and strongly agree, respectively. The values of scale-level content validity (S-CVI) indicators, namely the S-CVI/average number and S-CVI/utility agreement, were calculated for vaccine acceptance (1, 1) susceptibility to develop COVID-19 infection (0.9, 1), severity of COVID-19 infection (0.9, 1), benefits of COVID-19 vaccination (0.9, 1), barriers to accept the COVID-19 vaccine (0.85, 1), cues to action (0.9, 1), and WTP for the COVID-19 vaccine (1, 1). The reliability of predictors indicated in the HBM hypothesis section of the survey was examined. The findings of the reliability test performed in a pilot sample survey revealed a Cronbach's alpha coefficient of 0.80 for susceptibility to COVID-19 infection, 0.78 for the severity of COVID-19 infection, 0.76 for the benefits of COVID-19 vaccination, 0.80 for barriers to accept the vaccine, and 0.78 for clue to action, indicating acceptable internal consistency[18].

2.6. Data collection

Data were collected through the online mode by providing a link to fill Google Forms questionnaire or survey tool consisting of questions on demographics, perceived health status, COVID-19 experience, intention to accept COVID-19 vaccine, HBM construct, and WTP for the COVID-19 vaccine. The survey tool was circulated in various messenger groups (WhatsApp, WeChat, and IMO) and social media networks (Facebook, Twitter, Instagram, and LinkedIn). The first page of the form described the background, core objectives, and expected outcomes of the survey. Respondent were required to select the 'yes' response for the first question (Are you willing to participate in this COVID-19 vaccine online survey?) to enter into the study. A total of 2 499 respondents completed the survey. After removing 48 incomplete responses, 2 451 responses were included in the final analysis.

2.7. Data analysis

IBM SPSS Statistics for Windows, version 22.0 (IBM Corp., Armonk, NY, USA) was used to analyse data collected from respondents. Data were cleaned, sorted, and processed prior to the start of analysis in the Excel spread sheet. Univariate and multivariate logistic regression analyses were performed to examine the association of independent variables (demographics, health status, COVID-19 experience, and HBM predictors) with the dependent variable (intention to receive the COVID-19 vaccine), as well as to determine factors associated with marginal WTP for the COVID-19 vaccine. Only factors that showed significance (P<0.05) in the univariate analysis were included in the multivariate or multinominal logistic regression analysis.

3. Results

3.1. Demographics

Of 2 480 respondents, 2 451 completed the online survey, yielding a response rate of 98.8%. Participants who participated in the survey had diverse demographics in terms of their location, educational level, occupation type, and family income. The median age was 23 (21, 25) [median (Q1, Q3)], the majority were aged between 20 and 29 years (1 374, 56.06%), were men (1 473, 60.10%), were unmarried (1 539, 62.79%), were residing in urban areas (981, 40.02%), were pursuing or had completed their graduation, postgraduation, or Ph.D (1 851, 75.52%), were students pursuing graduation, postgraduation, or Ph.D (1 266, 51.77%), had a professional or managerial-level job (591, 24.11%), and had a family income between INR: 20 001-40 000 or USD: 276.10-552.17

(819, 33.41%; Table 1). Regarding health status, few participants reported poor or fair health (57, 2.33%) or had a chronic disease (348, 14.2%). More than half of the respondents (1 353, 55.20%) reported that their close one (family member, friend, colleague, and neighbour) was infected with COVID-19.

Table 1. Demographics, perceived health status, and COVID-19 experience of respondents (n=2 451).

Variable	Frequency (%)
Age in years	
<20	264 (10.77)
20-29	1 374 (56.06)
30-39	285 (11.63)
40-49	285 (11.63)
50-59	168 (6.85)
>60	75 (3.06)
Gender	
Male	1 473 (60.10)
Female	978 (39.90)
Marital status	
Married	912 (37.21)
Unmarried	1 539 (62.79)
Area of location	
Urban	981 (40.02)
Semi-urban	651 (26.56)
Rural	819 (33.41)
Education	
Graduate/Postgraduate/Ph.D	1 851 (75.52)
Intermediate/Post high school diploma	387 (15.79)
Secondary school	87 (3.55)
Middle school	39 (1.59)
Primary school	12 (0.49)
Illiterate	75 (3.06)
Occupation	
Professional or managerial	591 (24.11)
Semi-professional	81 (3.30)
Clerical/shop/farm	132 (5.39)
Skilled worker	96 (3.92)
Semi-skilled worker	27 (1.10)
Un-skilled worker	12 (0.49)
Student	1 269 (51.77)
House wife/unemployed/retired/others	243 (9.91)
Monthly Family Income (INR)	
≤5 000 (USD 69.02)	312 (12.73)
5 001-10 000 (USD 69.03-138.04)	198 (8.08)
10 001-20 000 (USD 138.06-276.08)	492 (20.07)
20 001-40 000 (USD 276.10-552.17)	819 (33.41)
40 001-80 000 (USD 552.18-1 104.33)	426 (17.38)
>80 000 (USD 1 104.33)	204 (8.32)
Profession	
Healthcare	1 011 (41.25)
Non-healthcare	1 440 (58.75)
Suffering with chronic disorders	
Yes	348 (14.20)
No	2 103 (85.80)
Perceived overall health	
Very good	744 (30.35)
Good	1 650 (67.32)
Fair/poor	57 (2.33)
Know any close one got infected	
Yes	1 353 (55.20)
No	1 098 (44.80)

INR=Indian Rupee.

3.2. Health beliefs

The findings of HBM constructs revealed that the perceived susceptibility to COVID-19 infection was considerably high among study respondents. The majority (2 052, 83.72%) of respondents were concerned that their daily work and communication with many people can increase their susceptibility to COVID-19 infection. Furthermore, the majority of respondents believed that COVID-19 may affect their family members (1 836, 74.91%) and that they may lose their income (1 317, 53.73%). More than three-fourth of respondents believed that vaccination is an appropriate choice and can reduce worry and prevent COVID-19. The majority of participants agreed that side effects (1 851, 75.52%), doubts regarding the protective effect of the vaccine (2 100, 85.68%), high cost (1 707, 69.64%), and shortage of the vaccine (1 833, 74.8%) are potential barriers for COVID-19 vaccination. The majority of them agreed to receive the vaccine if adequate information is provided by health authorities (2 109, 86.05%) and after maximal intake by the public (1 914, 78.09%). The aforementioned findings regarding HBM constructs are shown in Table 2.

3.3. COVID-19 vaccination intent

The majority (2 188, 89.27%) of 2 451 respondents were intending to receive the COVID-19 vaccine, whereas only a few (263, 10.73%) were not intending to receive the COVID-19 vaccine. For the statement 'If a vaccine against COVID-19 infection is available, I would get it', 910 (37.12%), 1 278 (52.14%), 201 (8.20%), 38 (1.55%), and 24 (0.98%) respondents selected the options of strongly agree, agree, neutral, disagree, and strongly disagree, respectively.

The findings of univariate and multivariate regression analyses are listed in Table 3. The results revealed that age, marital status, place of residence, educational level, occupation, monthly family income, profession, presence of a chronic disease, and perceived health status were significantly (P<0.05) associated with the intention to receive the COVID-19 vaccine in the general public of India.

Three items under the construct of perceived susceptibility to COVID-19 infection, namely the risk of COVID-19 infection for the next few months (*OR* 1.62; 95% *CI* 1.23-2.12), worry regarding COVID-19 infection (*OR* 1.63; 95% *CI* 1.26-2.11), and the belief that communicating with many people each day can increase their risk of COVID-19 (*OR* 2.14; 95% *CI* 1.59-2.88) were found to be significantly associated with the intention to receive the COVID-19 vaccine. Under the construct of the perceived severity of COVID-19, the belief that COVID-19 makes the person very sick (*OR* 1.29; 95% *CI* 0.99-1.69) and fear towards COVID-19 infection (*OR* 2.50; 95% *CI* 1.89-3.31) were found to significantly associated with the acceptance of the COVID-19 vaccine. Benefits of COVID-19 vaccination, reduction of worry (*OR* 5.87; 95% *CI* 4.32-7.96), and sickness caused by SARS-CoV-2 infection (*OR* 4.31; 95% *CI* 3.31-5.62) were significantly associated an improvement in vaccine intake. Participants who were concerned regarding possible side effects (*OR* 0.36; 95% *CI* 0.25-0.54) and shortage (*OR* 0.58; 95% *CI* 0.41-0.81) of the COVID-19 vaccine

Table 2. Distribution of agree responses to HBM constructs (n=2 451).

HBM constructs	Frequency (%)
Perceived susceptibility to get COVID-19 infection	
I worry a lot about getting COVID-19	1 320 (53.85)
I am at risk of getting COVID-19 in the next few months	1 050 (42.84)
Working or communicating with many people each day increases my chances of getting the COVID 19	2 052 (83.72)
My family members are at risk of getting the COVID-19	1 272 (51.90)
Perceived severity of COVID-19 infection	
If I get the COVID-19 I will be very sick	1 080 (44.06)
If I get the COVID-19 I will lose my income	1 317 (53.73)
If I get the COVID-19 other members in my home will get sick	1 836 (74.91)
If I get the COVID-19 I will get serious complications like death	594 (24.23)
I am very afraid of getting COVID-19 vaccine	1 191 (48.59)
Perceived benefits of COVID-19 vaccination	
Vaccination is a good idea because it makes me feel less worried about catching COVID-19	2 205 (89.96)
If I receive the COVID-19 vaccine, I will not get sick from the COVID-19	1 905 (77.72)
Perceived barriers to accept vaccine	
I am concern about having side-effects to the COVID-19 vaccine	1 851 (75.52)
I am concern about the protective effect of the COVID-19 vaccine	2 100 (85.68)
The novel CORONA virus vaccine will be painful	1 167 (47.61)
I am concern about my affordability (high cost) of getting the COVID-19 vaccination	1 707 (69.64)
There will be a shortage of the COVID-19 vaccine	1 833 (74.78)
Cues to action	
I will only take the COVID-19 vaccine if I was given adequate information about it	2 109 (86.05)
I will only take the COVID-19 vaccine if the vaccine is taken by many in the public	1 914 (78.09)

HBM=Health Belief Model.

had lower intention to receive the vaccine. Participants who agreed that they will only take the COVID-19 vaccine if it is taken by many people had lower intention to receive the vaccine (*OR* 0.49; 95% *CI* 0.33-0.71). The aforementioned findings showing the association of HBM constructs with the intention to receive the COVID-19 vaccine are shown in Table 4.

3.4. WTP

The majority (2 162, 88.21%) of participants were willing to pay an amount of INR: 500 (USD: 6.81) or INR: 1 000 (USD: 13.62) for a COVID-19 vaccine. The median (Q1, Q3) WTP for a dose of COVID-19 vaccine was INR: 500 (500, 1 000) or USD: 6.81 (6.81, 13.62). Table 5 shows the findings of univariate and multinominal logistic regression analysis performed for an amount of INR: 1 500-2 000 (USD: 20.42-27.23) and INR: 2 500-3 000 (USD: 34.04-40.85) by considering an amount of INR: 500-1 000 (USD: 6.81-13.62) as a reference. Participants who were aged between 50 and 59 years, were married, had an intermediate educational level, had a family income of >INR 40 001 (USD: 552.18), and had fair or poor perceived health were more significantly willing to pay INR: 1 500-2 000 (USD: 20.42-27.23) over INR: 500-1 000 (USD: 6.81-13.62). Participants who had a primary school background, had a chronic disease, and did not have a close one infected with COVID-19 were less significantly willing to pay INR: 1 500-2 000 (USD: 20.42-27.23) over INR: 500-1 000 (USD: 6.81-13.62). Female respondents and those with a family income of more than INR: 80 001 were significantly more willing to pay INR: 2 500-3 000 (USD: 34.04-40.85) over INR: 500-1 000 (USD: 6.81-13.62). HBM constructs, namely perceived susceptibility, perceived severity, barriers for vaccination, and cues to action, were also significantly associated with a WTP of INR: 1 500-2 000 (USD: 20.42-27.23) and INR: 2 500-3 000 (USD: 34.04-40.85) over INR: 500-1 000 (USD: 6.81-13.62) as shown in Table 6.

4. Discussion

This study used the HBM approach to determine the predictors of the acceptance of and WTP for a COVID-19 vaccine in the general public of India. Understanding the predictors of COVID-19 vaccine acceptance and WTP for the vaccine are crucial to reduce vaccine hesitancy and improve vaccine coverage. A study demonstrated a moderate hesitancy and gap in the coverage of existing vaccines in the general public of India[19]. Thus, the assessment of HBM constructs (susceptibility, severity, barriers for vaccination, benefits of vaccine, and cue of action) and their association with COVID-19 vaccine acceptance and WTP can provide the basis for developing policies or guidelines to improve the coverage of the vaccine when it is available in the Indian market. To our knowledge, this is the first study to examine the acceptance of and WTP for the COVID-19 vaccine in the Indian public.

Regarding the susceptibility to COVID-19 infection, the findings revealed that many respondents were concerned that daily work and communication with numerous people can increase their risk COVID-19, whereas relatively few participants perceived themselves and their family as having a high risk of COVID-19. These findings suggest the need to increase the risk perception among the public and enhance the uptake of the COVID-19 vaccine. Evidence supports that a behavioural change in the risk perception among the

Table 3. Multivariate logistic regression analysis respondent characteristics associated with an intended to take COVID-19 vaccine (n=2 451).

Variable	Frequency (%)	Univariate analysis		Multivariable logistic regression analysis
		Intended to take vaccine	*P* value	Intended to take vaccine [*OR* (95% *CI*)]
Age in years				
<20	264 (10.77)	231 (87.50)		Ref
20-29	1 374 (56.06)	1 185 (86.24)		0.90 (0.60-1.33)
30-39	285 (11.63)	262 (91.93)	<0.001	1.62 (0.93-2.85)
40-49	285 (11.63)	276 (96.84)		4.38 (2.05-9.35)***
50-59	168 (6.85)	162 (96.43)		3.86 (1.58-9.41)**
>60	75 (3.06)	72 (96.00)		3.43 (1.02-11.51)*
Marital status				
Married	912 (37.21)	859 (94.19)	<0.001	2.56 (1.87-3.50)***
Unmarried	1 539 (62.79)	1 329 (86.35)		Ref
Area of location				
Urban	981 (40.02)	864 (88.07)	0.005	Ref
Semi-urban	651 (26.56)	603 (92.63)		1.70 (1.19-2.41)**
Rural	819 (33.41)	721 (88.03)		0.99 (0.74-1.32)
Education				
Graduate/Postgraduate/Ph.D	1 851 (75.52)	1 614 (87.20)		0.26 (0.14-0.45)*
Intermediate/PHSD	387 (15.79)	370 (95.60)		0.79 (0.52-1.19)
Secondary school	87 (3.55)	84 (96.55)	<0.001	1.04 (0.29-3.76)
Middle school	39 (1.59)	36 (92.31)		0.44 (0.11-1.64)
Primary school	12 (0.49)	12 (100.00)		1.21 (0.06-24.82)
Illiterate	75 (3.06)	72 (96.00)		Ref
Occupation				
Professional or managerial	591 (24.11)	558 (94.42)		1.11 (0.59-2.08)
Semi-professional	81 (3.30)	75 (92.59)		0.82 (0.30-2.19)
Clerical/shop/farm	132 (5.39)	120 (90.91)		0.66 (0.29-1.45)
Skilled worker	96 (3.92)	87 (90.62)		0.63 (0.27-1.50)
Semi-skilled worker	27 (1.10)	27 (100.00)	<0.001	3.73 (0.22-64.10)
Un-skilled worker	12 (0.49)	10 (83.33)		0.32 (0.06-1.64)
Student	1 269 (51.77)	1 083 (85.34)		0.38 (0.22-0.66)**
House wife/unemployed/retired/others	243 (9.91)	228 (93.83)		Ref
Monthly family income (INR)				
≤5 000 (USD 69.02)	312 (12.73)	264 (84.62)		Ref
5 001-10 000 (USD 69.03-138.04)	198 (8.08)	156 (78.79)		0.70 (0.44-1.11)
10 001-20 000 (USD 138.06-276.08)	492 (20.07)	435 (88.41)	<0.001	1.46 (0.97-2.19)
20 001-40 000 (USD 276.10-552.17)	819 (33.41)	747 (91.21)		1.98 (1.34 -2.91)**
40 001-80 000(USD 552.18-1 104.33)	426 (17.38)	399 (93.66)		2.82 (1.72-4.61)***
>80 000 (USD 1 104.33)	204 (8.32)	189 (92.65)		2.40 (1.31-4.41)**
Profession				
Healthcare	1 011 (41.25)	925 (91.49)	<0.001	Ref
Non-healthcare	1 440 (58.75)	1 263 (87.71)		0.66 (0.49-0.88)**
Suffering with chronic disorders				
Yes	348 (14.20)	331 (95.11)	<0.001	Ref
No	2 103 (85.80)	1 857 (88.30)		0.38 (0.23-0.64)***
Perceived overall health				
Very good	744 (30.35)	637 (85.62)	<0.001	Ref
Good	1 650 (67.32)	1 503 (91.09)		1.71 (1.31-2.24)***
Fair/poor	57 (2.33)	48 (84.21)		0.89 (0.42-1.87)

PHSD=Post high school diploma; INR=Indian Rupee; *P<0.05, **P<0.01, ***P<0.001.

public plays a crucial role in combating infectious diseases during pandemic situations[20]. The perception towards the severity of COVID-19 infection was lower among study participants. These results are in contrast to the findings of a COVID-19 vaccine study conducted in Malaysia[21]. This variation in study findings can be attributed to the time point of study initiation; our study was conducted when the recovery rate was high in the country. Thus, the perception regarding the severity of COVID-19 infection among the public should be increased to improve vaccine uptake. Most of the participants in our study demonstrated high perception towards the benefits of COVID-19 vaccination. These results are similar to those of the study conducted in Malaysia[21]. Perceived potential barriers against COVID-19 immunisation found in this study, namely worry regarding side effects, protection effect, and affordability of the COVID-19 vaccine, are in accordance with those reported in other studies related to the launch of the new vaccine[22]. Our study findings indicated that respondents were more concerned regarding the safety and efficacy of the COVID-19 vaccine than the cost of the vaccine. Hence, public health programmes targeting on promoting the benefits of vaccination and reducing barriers to vaccination are essential for improving vaccine acceptance. In terms of cues to action, the majority of respondents were willing to receive the

Table 4. Multivariate logistic regression analysis of HBM constructs associated with an intended to take COVID-19 vaccine (n=2 451).

Variable	Frequency (%)	Univariate analysis		Multivariable logistic regression analysis
		Intended to take vaccine	*P*-value	Intended to take vaccine [*OR* (95% *CI*)]
Perceived susceptibility to get COVID-19 infection				
I worry a lot about getting COVID-19				
Agree	1 320 (53.86)	1 207 (91.44)	<0.001	1.63 (1.26-2.11)***
Disagree	1 131 (46.14)	981 (86.74)		Ref
I am at risk of getting COVID-19 in the next few months				
Agree	1 050 (42.84)	964 (91.81)	<0.001	1.62 (1.23-2.12)***
Disagree	1 401 (57.16)	1 224 (87.37)		Ref
Working or communicating with many people each day increases my chances of getting the COVID-19				
Agree	2 052 (83.72)	1 861 (90.69)	<0.001	2.14 (1.59-2.88)***
Disagree	399 (16.28)	327 (81.96)		Ref
Perceived severity of COVID-19 infection				
If I get the COVID-19 I will be very sick				
Agree	1 080 (44.06)	979 (90.65)	0.050	1.29 (0.99-1.69)*
Disagree	1 371 (55.94)	1 209 (88.18)		Ref
I am very afraid of getting COVID-19				
Agree	1 191 (48.60)	1 114 (93.53)	<0.001	2.50 (1.89-3.31)***
Disagree	1 260 (51.40)	1 074 (85.24)		Ref
Perceived benefits of COVID-19 vaccination				
Vaccination is a good idea because it makes me feel less worried about catching COVID-19				
Agree	2 205 (89.96)	2 026 (91.88)	<0.001	5.87 (4.32-7.96)***
Disagree	246 (10.04)	162 (65.85)		Ref
If I receive the COVID-19 vaccine, I will not get sick from the COVID-19				
Agree	1 905 (77.72)	1 774 (93.12)	<0.001	4.31 (3.31-5.62)***
Disagree	546 (22.28)	414 (75.82)		Ref
Perceived barriers to accept vaccine				
I am concern about having side-effects to the COVID-19 vaccine				
Agree	1 851 (75.52)	1 618 (87.41)	<0.001	0.36 (0.25-0.54)***
Disagree	600 (24.48)	570 (95.00)		
There will be a shortage of the COVID-19 vaccine				
Agree	1 833 (74.79)	1 615 (88.17)	0.001	0.58 (0.41-0.81)**
Disagree	618 (25.21)	573 (92.72)		
Cues to action				
I will only take the COVID-19 vaccine if the vaccine is taken by many in the public				
Agree	1 914 (78.09)	1 676 (87.57)	<0.001	0.49 (0.33-0.71)***
Disagree	537 (21.91)	502 (93.48)		Ref

CI=Confidence interval; *OR*=Odds ratio; *P<0.05, **P<0.01, ***P<0.001.

vaccine if comprehensive information regarding the vaccine was provided. This finding implies that public health authorities should communicate evidence-based information regarding the COVID-19 vaccine by using national media and social networks.

In this study, a large proportion (89.27%) of participants intended to receive the COVID-19 vaccine. A study conducted in China during May 2020 reported that 83.5% of respondents intended to receive the vaccine; this percentage is similar to that observed in our study[23]. A study conducted in Malaysia, which had only over 4 000 COVID-19 cases and less than 1 000 COVID-19 related deaths, in April 2020 reported that a high proportion of participants (94.30%) intended to receive the COVID-19 vaccine[21]. However, a small-scale study conducted in the United States, which had over one million COVID-19 cases and over 100 000 COVID-19-related deaths reported a low rate (67.00%) of vaccine acceptance[24]. A study conducted in Indonesia during March 2020 reported a large rate (93.3%) of acceptance for a 95% effective vaccine, and the acceptance rate declined to 67.00% for a 50.00% effective vaccine[25]. These results also support our finding that the public is more concerned regarding the protective effect of the COVID-19 vaccine. A global survey showed a wide range of vaccine acceptance in Russia (54.85%), Poland (56.31%), France (58.81%), Nigeria (65.22%), Sweden (65.23%), Singapore (67.94), Germany (68.42%), Canada (68.74%), Italy (70.79%), the United Kingdom (71.48%), Ecuador (71.93%), Spain (74.33%), India (74.53%), the United states (75.42%), Mexico (76.25%), South Korea (79.79%), South Africa (81.58%), Brazil (85.36%), and China (88.62%)[26]. Compared with this global survey, our findings revealed a higher vaccine acceptance rate (89.27%) because our study was performed after the sensitisation of public by the government of India regarding the intake of the COVID-19 vaccine[26]. However, because of the lack of evidence, we did not perform an intercountry comparison of vaccine acceptance based on the severity level.

The findings of multivariate logistic regression analysis revealed that respondents who were aged >40 years, were married, were residing in a semi-urban location, and had a family income of >INR 20 001 (USD: 276.10) showed a significantly high intention to receive the COVID-19 vaccine. Students and nonhealthcare professionals demonstrated a low intention to receive the COVID-19 vaccine. Hence, educational interventions targeting the student community,

Table 5. Multinominal logistic regression analysis of respondent characteristics associated with marginal WTP for COVID-19 vaccine (n=2 451).

Variable	Frequency (%)	Univariate analysis of marginal WTP			P-value	Multinominal logistic regression analysis	
		INR: 500-1 000	INR: 1 500-2 000	INR: 2 500-3 000		INR: 1 500-2 000 [*OR* (95% *CI*)]	INR: 2 500-3 000 [*OR* (95% *CI*)]
Age in years							
<20	264 (10.77)	252 (95.45)	3 (1.14)	9 (3.41)		0.27 (0.05-1.35)	2.40 (0.29-19.27)
20-29	1 374 (56.06)	1 203 (87.55)	96 (6.99)	75 (5.46)		1.81 (0.56-5.86)	4.24 (0.58-30.95)
30-39	285 (11.63)	237 (83.16)	33 (11.58)	15 (5.26)	<0.001	3.16 (0.94-10.61)	4.30 (0.56-33.17)
40-49	285 (11.63)	263 (92.28)	10 (3.51)	12 (4.21)	1.000	0.86 (0.23-3.22)	3.10 (0.39-24.28)
50-59	168 (6.85)	136 (80.95)	26 (15.48)	6 (3.57)		4.33 (1.27-14.83)*	3.00 (0.35-25.42)
>60	75 (3.06)	71 (94.67)	3 (4.00)	1 (1.33)		Ref	Ref
Marital status							
Married	912 (37.21)	795 (87.17)	87 (9.52)	30 (3.29)	<0.001	1.78 (1.30-2.43)***	0.59 (0.38-0.89)*
Unmarried	1 539 (62.79)	1 367 (88.82)	84 (5.46)	88 (5.72)	1.000	Ref	Ref
Gender							
Male	1 473 (60.10)	1 317 (89.41)	96 (6.52)	60 (4.07)	0.051	Ref	Ref
Female	978 (39.90)	845 (86.40)	75 (7.67)	58 (5.93)		1.22 (0.89-1.67)	1.51 (1.04-2.18)*
Area of location							
Urban	981 (40.02)	848 (86.44)	75 (7.65)	58 (5.91)	0.015	Ref	Ref
Semi-urban	651 (26.56)	575 (88.32)	54 (8.29)	22 (3.38)		1.06 (0.74-1.53)	0.56 (0.34-0.92)*
Rural	819 (33.41)	739 (90.23)	42 (5.13)	38 (4.64)		0.64 (0.43-0.95)	0.75 (0.49-1.14)
Education							
Graduate/PG/Ph D	1 851 (75.52)	1 617 (87.36)	141 (7.62)	93 (5.02)		Ref	Ref
Intermediate/PHSD	387 (15.79)	361 (93.28)	14 (3.62)	12 (3.10)	<0.001	2.39 (1.34-4.27)**	1.73 (0.94-3.19)
SSE	87 (3.55)	80 (91.95)	4 (4.60)	3 (3.45)	1.000	1.72 (0.62-4.76)	1.53 (0.47-4.94)
MSE	39 (1.59)	29 (74.36)	6 (15.38)	4 (10.26)		0.41 (0.17-1.01)	0.42 (0.14-1.21)
PSE	12 (0.49)	6 (50.00)	3 (25.00)	3 (25.00)		0.17 (0.42-0.69)*	0.11 (0.03-0.47)**
Illiterate	75 (3.06)	69 (92.00)	3 (4.00)	3 (4.00)		1.97 (0.61-6.35)	1.32 (0.41-4.28)
Occupation							
Professional or managerial	591 (24.11)	495 (83.76)	66 (11.17)	30 (5.08)		0.60 (0.13-2.84)	0.54 (0.06-4.63)
Semi-professional	81 (3.30)	75 (92.59)	3 (3.70)	3 (3.70)	0.002	0.18 (0.03-1.22)	0.36 (0.03-3.84)
Clerical/shop/farm	132 (5.39)	118 (89.39)	11 (8.33)	3 (2.27)		0.42 (0.08-2.19)	0.23 (0.02-2.43)
SW	96 (3.92)	86 (89.58)	4 (4.17)	6 (6.25)		0.21 (0.03-1.31)	0.63 (0.07-5.81)
SSW	27 (1.10)	21 (77.78)	4 (14.81)	2 (7.41)		0.86 (0.13-5.55)	0.86 (0.07-10.69)
USW	12 (0.49)	9 (75.00)	2 (16.67)	1 (8.33)		Ref	Ref
Student	1 269 (51.77)	1 143 (90.07)	66 (5.20)	60 (4.73)		0.26 (0.05-1.23)	0.47 (0.06-3.79)
HW/unemployed/retired/ others	243 (9.91)	215 (88.48)	15 (6.17)	13 (5.35)		0.31 (0.06-1.58)	0.54 (0.06-4.63)
Monthly family income (INR)							
≤5 000	312 (12.73)	291 (93.27)	8 (2.56)	13 (4.17)		Ref	Ref
5 001-10 000	198 (8.08)	184 (92.93)	4 (2.02)	10 (5.05)		0.79 (0.23-2.66)	1.26 (0.52-2.83)
10 001-20 000	492 (20.07)	445 (90.45)	32 (6.50)	15 (3.05)		2.62 (0.19-5.76)	0.75 (0.35-1.61)
20 001-40 000	819 (33.41)	733 (89.50)	42 (5.13)	44 (5.37)	<0.001	2.08 (0.97-4.49)	1.34 (0.71-2.53)
40 001-80 000	426 (17.38)	365 (85.68)	49 (11.50)	12 (2.82)		4.88 (2.28-10.47)***	0.74 (0.33-1.64)
>80 000	204 (8.32)	144 (70.59)	36 (17.65)	24 (11.76)		9.09 (4.12-20.07)***	3.73 (1.84-7.54)***
Suffering with chronic disorders							
Yes	348 (14.20)	306 (87.93)	34 (9.77)	8 (2.30)	0.007	Ref	Ref
No	2 103 (85.80)	1 856 (88.25)	137 (6.51)	110 (5.23)		0.66 (0.45-0.99)*	2.27 (0.19-4.69)
Perceived overall health							
Very good	744 (30.35)	659 (88.58)	47 (6.32)	38 (5.11)	0.001	Ref	Ref
Good	1 650 (67.32)	1 460 (88.48)	112 (6.79)	78 (4.73)		1.08 (0.77-1.53)	0.93 (0.62-1.38)
Fair/Poor	57 (2.33)	43 (75.44)	12 (21.05)	2 (3.51)		3.91 (1.93-7.92)***	0.81 (0.19-3.45)
Know any close one got infected							
Yes	1 353 (55.20)	1 170 (86.47)	115 (8.50)	68 (5.03)	0.003	Ref	Ref
No	1 098 (44.80)	992 (90.35)	56 (5.10)	50 (4.55)		0.57 (0.41-0.79)*	0.87 (0.59-1.26)

WTP values: INR: 500-1 000=USD: 6.81-13.62; INR: 1 500-2 000=USD: 20.42-27.23; INR: 2 500-3 000=USD: 34.04-40.85; Abbreviations: PG=Postgraduate; SW=Skilled worker; SSW=Semi skilled worker; WTP=Willingness to pay; USW=Unskilled worker; *P<0.05, **P<0.01, ***P<0.001.

Table 6. Multinominal logistic regression analysis of HBM constructs associated with marginal WTP for COVID-19 vaccine.

Variable	Frequency (%)	Univariate analysis of marginal WTP			*P*-value	Multinominal logistic regression analysis	
		INR: 500-1 000	INR: 1 500-2 000	INR: 2 500-3 000		INR: 1 500-2 000 [*OR* (95% *CI*)]	INR: 2 500-3 000 [*OR* (95% *CI*)]
Perceived susceptibility to get COVID-19 infection							
I worry a lot about getting COVID-19							
Agree	1 320 (53.86)	1 147 (86.90)	120 (9.09)	53 (4.02)	<0.001	2.08 (1.48-2.92)***	0.72 (0.49-1.05)
Disagree	1 131 (46.14)	1 015 (89.74)	51 (4.57)	65 (5.75)		Ref	Ref
I am at risk of getting COVID-19 in the next few months							
Agree	1 050 (42.84)	930 (88.57)	88 (8.38)	32 (3.05)	<0.001	1.40 (1.03-1.92)*	0.49 (0.33-1.75)
Disagree	1 401 (57.16)	1 232 (87.94)	83 (5.92)	86 (6.14)		Ref	Ref
My family members are at risk of getting the COVID-19							
Agree	1 272 (51.90)	1 101 (86.56)	113 (8.88)	58 (4.56)	<0.001	1.88 (1.35-2.60)***	0.93 (0.64-1.35)
Disagree	1 179 (48.10)	1 061 (89.99)	58 (4.92)	60 (5.09)		Ref	Ref
Perceived severity of COVID-19 infection							
If I get the COVID-19 I will be very sick							
Agree	1 080 (44.06)	925 (85.65)	92 (8.52)	63 (5.83)	0.002	1.56 (1.14-2.13)**	1.53 (1.06-2.22)*
Disagree	1 371 (55.94)	1 237 (90.23)	79 (5.76)	55 (4.01)		Ref	Ref
If I get the COVID-19 other members in my home will get sick.							
Agree	1 836 (74.91)	1 595 (86.87)	151 (8.22)	90 (4.90)	<0.001	2.68 (1.67-4.32)***	1.14 (0.74-1.76)
Disagree	615 (25.09)	567 (92.19)	20 (3.25)	28 (4.55)		Ref	Ref
If I get the COVID-19 I will get serious complications like death							
Agree	594 (24.24)	504 (84.85)	47 (7.91)	43 (7.24)	0.003	1.25 (0.88-1.77)	1.89 (1.28-2.78)**
Disagree	1 857 (75.76)	1 658 (89.28)	124(6.68)	75(4.04)		Ref	Ref
Perceived benefits of COVID-19 vaccination							
Perceived barriers to accept vaccine							
I am concern about having side-effects to the COVID-19 vaccine							
Agree	1 851 (75.52)	1 645 (88.87)	138 (7.43)	68 (3.67)	<0.001	1.31 (0.89-1.95)	0.43 (0.29-0.62)***
Disagree	600 (24.48)	517 (86.17)	33 (5.50)	50 (8.33)			
I am concern about the protective effect of the COVID-19 vaccine							
Agree	2 100 (85.68)	1 852 (88.19)	155 (7.38)	93 (4.43)	0.018	1.62 (0.96-2.75)	0.62 (0.39-0.98)*
Disagree	351 (14.32)	310 (88.32)	16 (4.56)	25 (7.12)		Ref	Ref
I am concern about my affordability (high cost) of getting the COVID-19 vaccination							
Agree	1 707 (69.65)	1 534 (89.87)	119 (6.97)	54 (3.16)	<0.001	0.94 (0.67-1.31)	0.34 (0.24-0.50)***
Disagree	744 (30.35)	628 (84.41)	52 (6.99)	64 (8.60)		Ref	
Cues to action							
I will only take the COVID-19 vaccine if I was given adequate information about it							
Agree	2 109 (86.04)	1 869 (88.62)	155 (7.35)	85 (4.03)	<0.001	1.52 (0.89-2.58)	0.40 (0.26-0.61)
Disagree	342 (13.95)	293 (85.67)	16 (4.68)	33 (9.65)		Ref	Ref
I will only take the COVID-19 vaccine if the vaccine is taken by many in the public							
Agree	1 914 (78.09)	1 707 (89.18)	128 (6.69)	79 (4.13)	0.005	0.79 (0.55-1.14)	0.54 (0.36-0.80)**
Disagree	537 (21.90)	455 (84.73)	43 (8.01)	39 (7.26)		Ref	Ref

WTP values: INR: 500-1 000=USD: 6.81-13.62; INR: 1 500-2 000=USD: 20.42-27.23; INR: 2 500-3 000=USD: 34.04-40.85; WTP=Willingness to pay. *P<0.05, **P<0.01, ***P<0.001.

nonhealthcare workers, participants aged <40 years, unmarried people, rural residents, and those with a low family income are essential for improving vaccine coverage in India.

The findings of our study revealed that HBM constructs were associated with COVID-19 acceptance; this result is similar to those of previous studies[21,23]. The results of the multivariate analysis of HBM constructs indicated that a high perception of the benefits of COVID-19 vaccination, susceptibility to COVID-19, and severity of COVID-19 was associated with increased vaccine acceptance, Respondents' high perception towards barriers to vaccination reduced their intention to receive the vaccine. These results are in contrast to those of the study conducted in Malaysia that reported respondents' high perception of the benefits of COVID-19 vaccination and low perception of barriers towards COVID-19 vaccination[21]. Healthcare interventions focusing on the identified individual HBM constructs can sensitise the public to accept the COVID-19 vaccine.

The results of this study revealed that the majority of respondents were willing to pay an amount of INR: 500-1 000 (USD: 6.81-13.62) for a dose of COVID-19 vaccine. The median WTP for a dose of COVID-19 vaccine was INR: 500 (500, 1 000) [USD: 6.81 (6.81, 13.62)]. Compared with other studies conducted in China (USD: 14-28), Ecuador (USD: 147.61-196.65), Chile (USD: 184.5-276.5), and Malaysia (USD: 11.5-23), the marginal WTP for the COVID-19 vaccine was lower (USD: 6.81-13.62) in India[21,23,27,28]. The wide variation in WTP values among different countries can be due to the variation in the characteristics of the study population and methods used to estimate the WTP value.

The findings of multinominal logistic regression analysis revealed that participants who were aged between 50 and 59 years, were married, had an intermediate educational background, had a family income of >INR 40 001 (USD: 552.18), and had a fair or poor perceived health status were significantly more willing to pay INR: 1 500-2 000 (USD: 20.42-27.23) over INR: 500-1 000 (USD: 6.81-13.62). The high WTP for the COVID-19 vaccine is majorly

attributed to the fear of susceptibility towards COVID-19 infection in respondents with poor perceived health status and advanced age. Female respondents and those with a family income of >INR 80 000 (USD: 1 104.33) had a significantly higher odds for a marginal WTP of INR: 2 500-3 000 (USD: 34.04-40.85) over INR: 500-1 000 (USD: 6.81-13.62). By considering the nationwide economic disruption resulting from the COVID-19 pandemic, the COVID-19 vaccine should made available to people belonging to all economic backgrounds including those with a lower socioeconomic status. This can be achieved by incorporating the COVID-19 vaccine in the national immunisation programme. HBM constructs, namely susceptibility to and severity of COVID-19 infection, had a higher odds for a WTP of INR: 1 500-2 000 (USD: 20.42-27.23) or INR: 2 500-3 000 (USD: 34.04-40.85). However, barriers to vaccination and cue to activity had a lower odds for a WTP of INR: 1 500-2 000 (USD: 20.42-27.23) or INR: 2 500-3 000 (USD: 34.04-40.85). Because HBM constructs were significantly associated with WTP, the HBM model should be used to inform the development of interventions for promoting vaccination against COVID-19 as a priority for expenditure.

The major strength of this study is its large sample size that was recruited during the COVID-19 unlock phase in India. The findings of our study provide insights into vaccine acceptance; these findings are similar to those of postvaccination because data were collected after community preparedness for COVID-19 vaccine uptake by the government of India. This study has some limitations that should be carefully considered before interpreting the findings of this study. First, because this was an online web-based survey, it might not have captured responses from locations where there is restricted access to social media and Internet facilities. Moreover, financially weaker sections of the society who do not have an Android phone or laptop were not included in our study sample; this may result in coverage bias. Second, because this was not an interview-based survey, respondents may have provided biased information in the self-administered online questionnaire of HBM constructs and vaccine intention. Third, we are unable to prevent bias due to a single-item measurement for vaccine intention. Because vaccine hesitancy is complex and multidimensional, diverse data collection approaches, scales, and behavioural models are required to identify accurate vaccine hesitancy[28,29]. Fourth, the voluntary nature of the online survey might have led to selection bias, and respondents may not effectively represent the entire population. Fifth, respondents unable to understand English were not covered in this online survey. Sixth, bias could have been introduced in WTP values for hypothetical vaccines during the vaccine development process. Thus, future studies on WTP should be conducted once the COVID-19 vaccine is available in the market. The WTP value for the COVID-19 hypothetical vaccine was estimated based on the current price of INR: 500-3 000 (USD: 6.81-40.85) of adult vaccines available in India. Thus, respondents' preferences for a WTP value of <INR 500 (USD: 6.81) and above INR: 3 000 (USD: 40.85), for the COVID-19 vaccine could not be evaluated in this study. Methods such as asking open-ended questions, closed-ended questions, and bidding games are available to accurately estimate WTP; however, they are feasible only in interview-based data collection. Thus, we selected a payment card method where a respondent was offered with different price options to select the WTP value. Despite these limitations, we believe our findings can provide guidance to enhance COVID-19 vaccine acceptance and for potential pricing.

In conclusion, the findings of this study indicated that the majority of respondents intended to receive the COVID-19 vaccine. HBM predictors such as a high perception towards susceptibility to infection, severity of the disease, and potential benefits of vaccination were associated with a high intention to receive the COVID-19 vaccine. Nonhealthcare professionals, students, and those not having any comorbidity exhibited low intention to receive the COVID-19 vaccine. Participants who were worried regarding the side effects and shortage of vaccines also had low intention to receive the COVID-19 vaccine. Healthcare interventions focusing on HBM and demographic predictors associated with low intention to receive the vaccine can be effective in enhancing the uptake of the COVID-19 vaccine. This study provides insights for government authorities to design and deliver targeted public intervention programmes for improving COVID-19 vaccine coverage.

Respondents who were aged between 50 and 59 years, were married, were female, had an intermediate educational background, had a family income of >INR 40 000 (USD: 552.17), and had a fair or poor perceived health showed a significantly high marginal WTP of INR 2 500 to 3 000 (USD 34.04 to 40.85, respectively) for receiving the COVID-19 vaccine. The cost of the COVID-19 vaccine should be subsidised for low-income groups. The findings of this study provide guidance for the future price consideration of the COVID-19 vaccine.

Conflict of interest statement

The authors declare that they have no conflicts of interest.

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Authors' contributions

All authors contributed in drafting and revising the manuscript. NG, SHC, BP, and SS were involved in the design of the study, data collection, and data analysis. NG, VKV, PB, and JDR were involved in theoretical formalism, data collection, data analysis, interpretation, and revision of the manuscript. All authors have read and approved the final manuscript.

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