

Cognizance, adverse effects and motivation regarding COVID-19 vaccination amongst health care professionals: A cross-sectional study

Shivani Sachdeva^{A,B}, Harish Saluja^{C-F}, Amit Mani^B

Department of Periodontology, Rural Dental College, Pravara Institute of Medical Sciences, Loni, India

A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of the article

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Address for correspondence

Shivani Sachdeva
E-mail: dr.shivani19@gmail.com

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Abstract

Background. Coronavirus disease 2019 (COVID-19) vaccines are currently at the forefront of India's fight against the pandemic. They have been shown to prevent the disease or reduce its severity, following 2 doses given at an interval of 6–8 weeks.

Objectives. The present cross-sectional survey was carried out on 1,145 health care practitioners in order to recognize and evaluate the adverse effects of vaccination as well as knowledge, motivation and attitudes with regard to vaccines amongst the respondents after the 1st dose of vaccination.

Material and methods. An anonymous survey was carried out among different age and gender groups in the medical colleges situated in the state of Maharashtra, India. The participants' responses were collected with the use of the Google Forms platform through sending a URL link to the questionnaire. The validity of the questionnaire was pilot-tested and the obtained Cronbach's alpha value was 0.80. Amongst the 1,145 participants, 92.2% of the respondents received COVISHIELD™ and 7.8% received COVAXIN®. The subjects were further scrutinized in 4 different age groups: 18–27 years (73.0%); 28–37 years (14.8%); 38–47 years (9.6%); and above 47 years (2.5%).

Results. Adverse effects were common in the age group of 18–27 years and were observed significantly more frequently in females than males. A very common symptom was pain at the site of injection with an occurrence of 85.2%. Fever was present in 62.6% of the respondents, with 39.1% having low-grade fever and very few having high-grade fever.

Conclusions. Knowledge about adverse effects and what to expect after vaccination would help to educate people, dispel misinformation and reduce vaccination hesitancy. It can also help to promote awareness about the incidence of adverse effects and the safety of COVID-19 vaccines.

Keywords: vaccination, adverse effect, COVID-19 vaccine

Cite as

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Introduction

The coronavirus disease 2019 (COVID-19) pandemic sets great challenges, for which the world is only partially prepared. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) combines lethal pathogenicity with severe infectivity. While SARS-CoV-1 and Middle East respiratory syndrome coronavirus (MERS-CoV) could be spread only by symptomatic patients, and thus could be repressed more easily, SARS-CoV-2 can be widely transmitted by both asymptomatic and pre-symptomatic individuals. Therefore, to curb the damage caused by COVID-19, primary efforts focus on confinement, physical distancing and vaccination.¹

Two COVID-19 vaccines – COVAXIN[®] (Bharat Biotech, Hyderabad, India) and COVISHIELD[™] (developed by the University of Oxford, UK/AstraZeneca, Cambridge, UK; manufactured by the Serum Institute of India, Pune, India) – are at the forefront for India in the fight against the disease. The Drugs Controller General of India has approved the viral vector vaccine Sputnik V, which was developed by the Gamaleya Research Institute of Epidemiology and Microbiology, Moscow, Russia. So, India is employing now the 3 vaccines in its large-scale COVID-19 vaccination drive, in which hundreds of millions doses are going to be administered.^{2,3} Table 1 enumerates the ingredients of the COVISHIELD vaccine available in India. The approved vaccines and their efficacy are depicted in Fig. 1, though it is worth mentioning that many vaccines are in a trial stage.⁴

The survey had 2 major aims – firstly, to put forward the adverse effects of vaccination, and secondly, to motivate the frontline health care workers in India for vaccination. The particular goals were as follows:




























- to study the spectrum of post-vaccination survey profiles for individual vaccines;
- to assess the immediate as well as late responses to the 1st dose of a COVID 19 vaccine;
- to assess motivation for the 2nd dose of a COVID 19 vaccine;
- to assess behavioral changes and attitudes toward the existing vaccines.

Table 1. Ingredients of the COVISHIELD vaccine

COVID-19 vaccine	Ingredients
COVISHIELD (Oxford/AstraZeneca)	I-histidine
	I-histidine hydrochloride monohydrate
	magnesium chloride hexahydrate
	polysorbate 80
	ethanol
	sucrose
	sodium chloride
	EDTA
	water for injection

COVID-19 – coronavirus disease 2019; EDTA – disodium edetate dihydrate.

How some of the Covid-19 vaccines compare

Company	Doses	Storage
RNA		
 Pfizer (BioNTech)		 -80 to -60°C (6 months) and 2 to 8°C (for up to 5 days)
 Moderna		 -25 to -15°C (6 months) and 2 to 8°C (for 30 days)
Viral vector		
 Oxford-AstraZeneca		 2 to 8°C (6 months)
 Sputnik V (Gamaleya)		 -18.5°C (liquid form) 2 to 8°C (dry form)
 Johnson & Johnson (Janssen)		 2 to 8°C (3 months)
Inactivated virus		
 CoronaVac (Sinovac)		 2 to 8°C
 Sinopharm		 2 to 8°C
 Covaxin (Bharat Biotech)		 2 to 8°C
Protein-based		
 Novavax		 2 to 8°C

Source: Wellcome Trust, BBC research

BBC

Fig. 1. Comparison of the various vaccines approved worldwide

The vaccination of health care professionals would not only protect them, but might also motivate the rest of the society to enthusiastically take part in vaccination.

The need of the hour is to identify common adverse effects, dissipate myths and abate vaccine uncertainty.

Material and methods

A descriptive, exploratory, anonymous cross-sectional survey for voluntary participation was carried out amongst medical and dental professionals. A total of 1,145 participants included the students, graduates, postgraduates, and staff working in the medical colleges situated in the state of Maharashtra, India, from February 25th to March 30th, 2021. The subjects were grouped based on the demographic variables of age and gender. There were 861 female and 284 male participants. Further, the subjects were scrutinized in 4 different age groups: 18–27 years (73.0%); 28–37 years (14.8%); 38–47 years (9.6%); and above 47 years (2.5%). No identifiable details were collected from the subjects.

An invitation message with a URL link to the online questionnaire was posted to the participants. The feedback

response rate was automatically saved. All responses were anonymous. The completion of the questionnaire required 4–5 min. The purpose of the survey was explained. Written informed consent was obtained during the introductory part of the survey; participation was entirely voluntary with the confidentiality of the participants preserved. Sending questionnaires to personal e-mail addresses was avoided to preserve the participants' anonymity and privacy. It was a self-administered questionnaire. Its internal consistency reliability and construct validity were determined with a Cronbach's alpha value of 0.80.

Statistical analysis

Descriptive statistics were used to assess the baseline characteristics. All quantitative variables were presented as mean and standard deviation ($M \pm SD$), and all qualitative variables as frequency – number and percentage (n (%)). The IBM SPSS Statistics for Windows software, v. 20.0 (IBM Corp., Armonk, USA), was used. The data was numerically coded and entered into the program. Both the descriptive statistics and the inferential statistics involving the χ^2 test were analyzed to compare the responses between the groups. For each test, a p -value of less than 0.05 was considered statistically significant. For continuous variables, the one-way analysis of variance (ANOVA)/the Kruskal–Wallis test were used to present the results.

Results

The present survey was carried out amongst the health care professionals in Maharashtra who got vaccinated for COVID-19. The total number of participants who could answer the questionnaire in the study was 1,145. The questionnaire was prepared in the form of 3 sets for the collection of data, and then the responses were assimilated. The participants were sent a link to the Google Forms platform, where the questionnaire was placed. The 1st set comprised questions about the demographic variables, including age and gender. The 2nd set of questions was related to the adverse effects experienced after vaccination, and the 3rd set of questions was related to motivation and the medications taken.

Adverse effects of COVID-19 vaccination in different age groups

Female health care professionals were greater in number and they were mostly aged 18–37 years. Adverse effects were common in the age group of 18–27 years and were observed significantly more frequently in females than males. The patient information brochure about the adverse effects of COVID-19 vaccination was read by 80% of the participants and 20% of the participants did not read the information prior to vaccination.

The graphical data presented in Fig. 2 shows the incidence of the post-vaccination symptoms amongst the participants in various age groups. The symptoms were observed in 78.5% of the participants from the age group of 18–27 years, followed by 72.4% of the participants aged 28–37 years and 53.6% of the participants aged 38–47 years. In the age group of 48 years and above, only 6.9% of the participants developed the symptoms.

Table 2 presents in detail the number and percentage of participants who experienced the symptoms and discomfort during work in various age groups after being administered the 1st dose of vaccination. Discomfort was observable mainly in the age group of 28–37 years (86.5% of the participants), followed by the participants from the age group of 38–47 years (57.3%). The results showed the importance of the assessment of discomfort during work, which could possibly be due to the presence of the symptoms after the vaccine administration.

It can be inferred from Table 2 that the onset of the symptoms was the slowest for the age group of 48 years and above; the group developed the symptoms in 13.40 h, while in the youngest age group, the symptoms occurred rapidly, within 8.45 h. Differences between the age groups in this respect were statistically significant.

It can also be inferred from Table 2 that the duration of the symptoms was the greatest for the youngest age group, but the difference was not statistically significant.

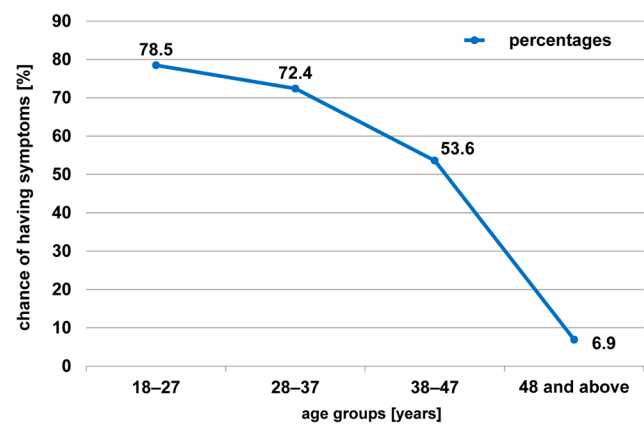


Fig. 2. Presence of the post-vaccination symptoms in different age groups

Adverse effects of COVID-19 vaccination in both gender groups

Table 3 shows the presence of the symptoms according to gender. The post-vaccination symptoms were more prevalent in females (79.2%) than males (47.9%). The onset of the symptoms was faster in males than females. The results were found to be statistically significant. Also, in terms of duration of the symptoms, the difference between the genders was clinically as well as statistically significant. Discomfort was also reported more frequently by females (69.1%) than males (35.6%) and the results were found to be statistically significant.

Table 2. Presence of the post-vaccination symptoms, their onset and duration, and the presence of discomfort during work after COVID-19 vaccination among the participants according to age

Variable		Age groups				p-value
		18–27 years	28–37 years	38–47 years	above 47 years	
Presence of symptoms	yes	656 (78.5)	123 (72.4)	59 (53.6)	2 (6.9)	0.001*
	no	180 (21.5)	47 (27.6)	51 (46.4)	27 (93.1)	
Onset of symptoms [h]		8.45 ±2.40	10.65 ±5.96	10.53 ±7.65	13.40 ±5.60	0.002*
Duration of symptoms [h]		28.20 ±15.20	25.78 ±13.80	20.82 ±10.30	20.90 ±7.21	0.081
Discomfort during work	yes	225 (26.9)	147 (86.5)	63 (57.3)	4 (13.8)	0.001*
	no	611 (73.1)	23 (13.5)	47 (42.7)	25 (86.2)	

Data presented as number (percentage) (*n* (%)) or mean ± standard deviation (*M* ±*SD*). * statistically significant.

Table 3. Presence of the post-vaccination symptoms, their onset and duration, and the presence of discomfort during work after COVID-19 vaccination among the participants according to gender

Variable		Gender		p-value
		male	female	
Presence of symptoms	yes	136 (47.9)	682 (79.2)	0.001*
	no	148 (52.1)	179 (20.8)	
Onset of symptoms [h]		8.15 ±7.65	13.26 ±5.25	0.001*
Duration of symptoms [h]		24.80 ±8.25	23.17 ±10.15	0.001*
Discomfort during work	yes	101 (35.6)	595 (69.1)	0.001*
	no	183 (64.4)	266 (30.9)	

Data presented as *n* (%) or *M* ±*SD*. * statistically significant.

Adverse effects of COVID-19 vaccination in the study population

The symptoms were categorized according to the fact sheet published by the Serum Institute of India, Pune, India, as very common, common and uncommon with regard to their relative incidence: >10%; ≤10%; and <1%, respectively.⁵ The classification is discussed in detail below.

Very common and common symptoms

Very common symptoms included pain with the incidence of 85.2%. The incidence of mild or low-grade fever (99.0–102.2°F) was 39.1%, 19.1% of the participants had moderate-grade fever (102.3–104.0°F) and very few had high-grade fever (Fig. 3).

Figure 4 shows that the participants in majority did not seem to have any change in appetite after vaccination (74.8%). A meager percentage (20.0%) revealed decreased appetite, which could be due to the pertaining myalgia and weakness.

Headache was reported by 60.0% of the participants, drowsiness was observed in 52.2%, chills were present in 46.1%, while joint pain was present in 46.0% of the respondents. Also, 21.0% had a sore throat. A lump was one of the commonest symptoms in our survey and occurred in 14.0% of the respondents, and 12.2% had a running nose (Fig. 5).

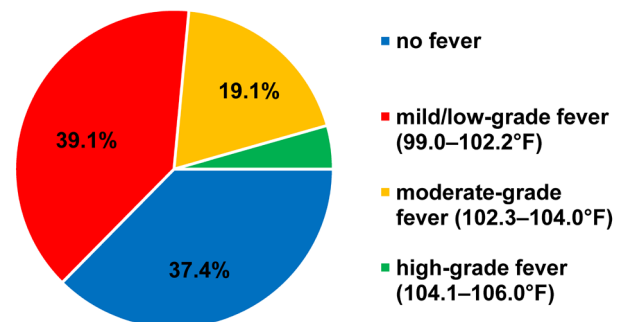


Fig. 3. Presence and grade of fever in the study participants

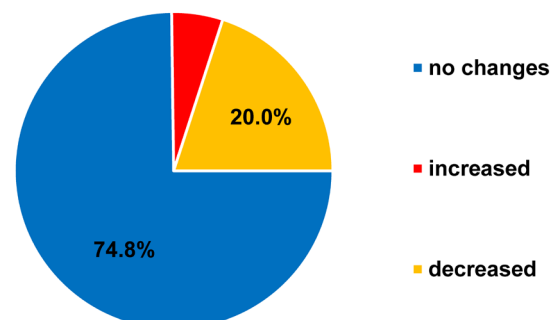


Fig. 4. Change in appetite in the study participants

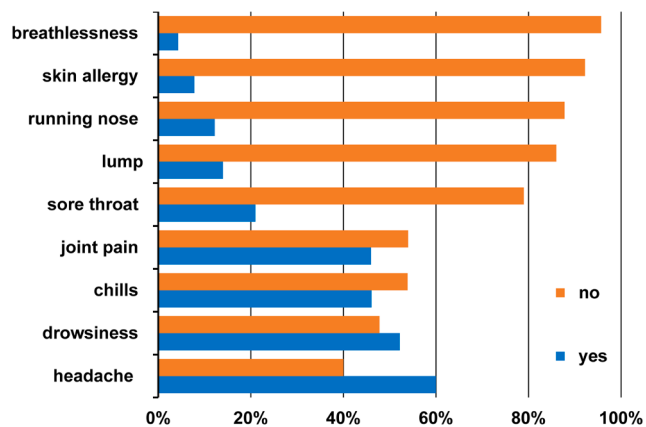


Fig. 5. Very common and common post-vaccination symptoms

Uncommon symptoms

The study showed that none of the participants had anaphylaxis. The post-vaccination symptoms either were absent or their presence was reported on the same day. After vaccination, none of the respondents had latent symptoms of herpes zoster or any other symptoms.

Behavioral changes regarding motivation and the application of medications

Motivation was increased after the 1st dose of vaccination and only 2.0% of the respondents refused to take the 2nd dose. A total of 98.5% were interested in motivating others for vaccination and 1.5% were in a dilemma. As many as 59.0% of the participants took 500 mg paracetamol after vaccination due to mild to moderate fever. Figure 6 depicts the day on which the post-vaccination symptoms started.

Discussion

Vaccines can be classified on the basis of the presence of whole viruses (live-attenuated or inactivated), viral vectors, nanoparticles or virus-like particles, subunit components, proteins/peptides, RNA, DNA, or live cells. COVID-19 vaccines tutor the immune system on how to espy and scuffle with the virus.⁶

To avoid the propagation of the pandemic, the basic reproduction number R_0 (viral transmission) must remain below 1, signifying that each infected person transmits the disease on average to 1 new person. Otherwise, there is a calamitous exponential growth in the count of new infections. The spontaneous dissipation of the virus is dubious. Surplus flare-ups could be expected if the safety measures are sidelined. The world was poorly prepared for the 1st wave of the SARS-CoV-2 spread.⁶ In order to limit the viral spread, restraint actions were undertaken, which halted further infections. The relaxation of the prevention rules

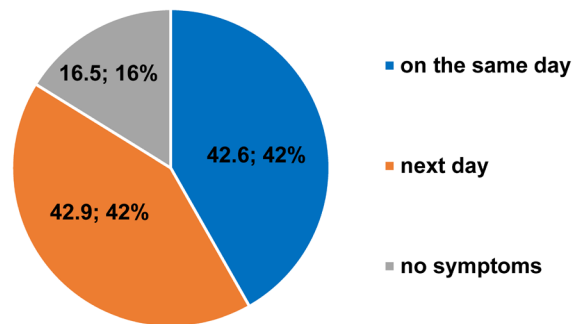


Fig. 6. Day on which the post-vaccination symptoms started

could contribute to new waves of the pandemic. Once vaccination is completed, it rapidly induces immunity in a pivotal percentage of the population, which is necessary for herd immunity. The immune response to SARS-CoV-2 consists in the activation of innate immunity as well as antigen-specific responses of T cells and B cells.⁷

Protection from a viral infection is mainly accomplished by the formation of virus-neutralizing antibodies. Humans gain potent immune protection after getting infected or vaccinated, which constitutes a fundamental principle for a wide variety of infections caused by viruses.

Broad immunization is notably beneficial as soon as “only” approx. 60–70% of the population have become immune. Inculcating touchstones regarding vaccination would taper off the viral spread.

Vaccine antigens

B cell/antibody targets

The available vaccines are mainly based on virus-neutralizing antibodies. Such antibodies usually block the interaction of the virus with its cellular receptor or prevent the conformational changes required for the melding of the virus with the cell membrane.

T cell targets

CD4 and CD8 T cells recognize and react with the SARS-CoV-2 antigens, contributing to immune protection, particularly by reducing disease severity. To some extent, it may also be due to the cross-reactive T cells induced by seasonal coronaviruses. T cells are perhaps less effective than the neutralizing antibodies in controlling the disease. Preventive anti-viral vaccines are favorable, as they induce antibodies that nullify viral particles in the extracellular space instantly after they enter the body and before the virus infects the host’s cells. CD4 T helper cells strongly promote B cell responses and antibody production. Thus, both B cells and T cells are induced by vaccines concurrently.^{7,8}

Adverse effects

Five types of adverse effects of immunization that are observed are vaccine product-related reaction, vaccine quality defect-related reaction, immunization error-related reaction, immunization anxiety-related reaction, and co-incident event.

With regard to the adverse effects of COVID-19 vaccines, the fact sheet for a vaccine recipient issued by the Serum Institute of India classifies the symptoms as very common, common and uncommon⁵:

- very common (affecting more than 1 in 10 people):
 - tenderness, pain, warmth, redness, itching, swelling, or bruising at the site of injection,
 - generally feeling unwell,
 - feeling tired (fatigue),
 - chills or feeling feverish,
 - headache,
 - feeling sick (nausea),
 - joint pain or muscle ache;
- common (affecting no more than 1 in 10 people):
 - a lump at the site of injection,
 - fever,
 - being sick (vomiting),
 - flu-like symptoms, such as high temperature, a sore throat, a running nose, a cough, and chills;
- uncommon (affecting 1 in 100 people):
 - feeling dizzy,
 - decreased appetite,
 - abdominal pain,
 - enlarged lymph nodes,
 - excessive sweating, itchy skin or a rash.

Despite knowing the possible side effects, and even the start of the 2nd wave of the COVID-19 pandemic, which is reported to be more deadly, there is still a lot of psychological stress among people with regard to vaccination. Therefore, the positive motivation of the whole society is a must.

Jayadevan et al. conducted a cross-sectional online survey that included questions pertaining to the immediate post-vaccination experience in Kerala, India.⁹ The survey was performed during a 1-week period from January 29 to February 4, 2020, on 5,396 people. At least 1 post-vaccination symptom was reported among 65.9% of the participants. Fatigue (45%), myalgia (44%), fever (34%), headache (28%), local pain at the site of injection (27%), joint pain (12%), nausea (8%), and diarrhea (3%) were the most prevailing symptoms.⁹ Also in the present study, mild fever was found in 39% of the participants, and the common adverse effects were more or less similar to those reported in the survey carried out in Kerala.

In the abovementioned study, the symptoms seemed to decrease with age,⁹ which was similar to the findings of our study. The iteration of symptoms was 81% (3rd decade, 20–29 years), 80% (4th decade, 30–39 years), 68% (5th decade, 40–49 years), 58% (6th decade, 50–59 years),

45% (7th decade, 60–69 years), 34% (8th decade, 70–79 years), and 7% (9th decade, 80–90 years),⁹ which is in accordance with the results of the present study, where the incidence of the post-vaccination symptoms was the greatest in the age group of 18–27 years, with a gradual decrease in incidence as the age of the participants increased.

Jayadevan et al. observed that the post-vaccination symptoms were reported more frequently by women (74.7%) as compared to men (58.6%) ($p < 0.001$).⁹ The inferences of the present study correspond to the above in terms of gender; adverse effects were more prevalent in females than males. Among the vaccinated female participants, 79% developed the post-vaccination symptoms, while the percentage was 47% in the case of males. As reported in February 2021 by the Centers for Disease Control and Prevention (CDC), during the 1st month of the COVID 19 vaccine rollout, 72% of the reported side effects occurred in females.¹⁰ Also, following the 2009–2010 H1N1 (swine flu) pandemic vaccine distribution, researchers found that 4 times as many women as men aged 20–59 years reported an allergic response to the H1N1 vaccine; the possible reason could be that the female sex hormones, estrogens, might be related to a stronger immune response.¹⁰ Similar results were obtained in the present study, where 79% of females reported adverse effects.

Limitations

The limitation of the present study was the selection bias, as the target population were health care professionals. The sample size of the population was small. Also, the self-reported data could be the source of bias, as the respondents might overestimate as well as underestimate their perception of adverse effects on the scale, which might have affected the outcomes of the study. Moreover, more systematic reviews and randomized controlled trials are required to relate the adverse effects of vaccination to the demographic data.

Conclusions

The study participants presented adverse effects like fever, chills, joint pain, a sore throat, a lump at the site of injection, and a running nose, most of them resembling the symptoms of influenza. Their incidence was greater in females than males. The youngest age group (18–27 years) was most affected. Currently, there is no standard treatment for COVID-19 across the globe. Applying simple measures, such as hand washing with soap, disinfection, wearing masks, or using personal protective equipment (PPE), should be practiced on regular basis. Researchers have made great efforts to bring out the various vaccines across the globe within an astonishing time period of just 1 year. It is essential for the masses to get themselves

injected and get herd immunity against the virus so as to prevent its further spread. There is a need to motivate the population for vaccination to reduce the mortality and curb the condition.

The need of the hour is to develop vaccines that aim at the initiation of protective immune responses, principally via virus-neutralizing antibodies specific for SARS-CoV-2. Although at least 1–2 years will be required to make efficacious vaccines available globally, vaccination may still be the most rapid and economical strategy to achieve widespread immune protection. The so-called “herd immunity” has to be reached, deserting the virus to local chances for circulation. This will happen when a critical percentage (>90%) of the population is immune.

Future perspectives

Undoubtedly, trust is an elemental and feasibly modifiable factor in the successful uptake of COVID-19 vaccination. We should revise the exemplars we learned from earlier infectious disease outbreaks and public health emergencies, which included the diseases caused by human immunodeficiency virus (HIV), H1N1, SARS, MERS, and Ebola. These admonish us that the trustworthy sources of information and guidance are the axioms in the control of such outbreaks. It is essential to address the hesitancy related to vaccination. It is a voluminous, complicated and context-dependent endeavor that must be made simultaneously at international, national and communal stages. Clear and consistent communication by government officials is crucial to building public confidence in vaccination programs.

Ethics approval and consent to participate

The ethical approval was obtained from the institutional Research Ethics Committee (No. of approval: PIMS/DR/RDC/2020/35). The respondents provided informed consent prior to completing the questionnaire.

Data availability


All data generated and/or analyzed during this study is included in this published article.


Consent for publication

The subjects understood that their names and initials would not be published and due efforts would be made to conceal their identity, but anonymity could not be guaranteed.

ORCID iDs

Shivani Sachdeva  <https://orcid.org/0000-0003-2124-8120>

Harish Saluja  <https://orcid.org/0000-0002-9511-083X>

Amit Mani  <https://orcid.org/0000-0002-4433-7487>

References

1. Sachdeva S, Saluja H, Mani A, Mani S, Chawla K, Mohammadi SN. Facial masks for COVID-19 pandemic: an approach toward awareness among health practitioners. *Journal Head Neck Physicians Surg.* 2021;9(2):136–141. doi:10.4103/jhnps.jhnps_19_21
2. Sah R, Shrestha S, Mehta R, et al. AZD1222 (Covishield) vaccination for COVID-19: Experiences, challenges, and solutions in Nepal. *Travel Med Infect Dis.* 2021;40:101989. doi:10.1016/j.tmaid.2021.101989
3. Bharat Biotech. Bharat Biotech announces phase 3 results of COVAXIN®: India's first COVID-19 vaccine demonstrates interim clinical efficacy of 81%. 2021. <https://www.bharatbiotech.com/images/press/covaxin-phase3-efficacy-results.pdf>. Accessed March 3, 2021.
4. Tripathi A. At 3 million doses, biggest tranche of Sputnik V vaccines lands in India. 2021. <https://www.ndtv.com/india-news/at-3-million-doses-biggest-tranche-of-sputnik-v-vaccines-lands-in-india-2453619>. Accessed June 11, 2021.
5. Fact sheet on COVISHIELD™. 2021. https://www.seruminstitute.com/pdf/covishield_fact_sheet.pdf. Accessed March 30, 2021.
6. Trigg N. COVID: Can we really jab our way out of lockdown? 2021. <https://www.bbc.com/news/health-55488724>. Accessed January 5, 2021.
7. Menachery VD, Gralinski LE, Mitchell HD, et al. Combination attenuation offers strategy for live attenuated coronavirus vaccines. *J Virol.* 2018;92(17):e00710-18. doi:10.1128/JVI.00710-18
8. Speiser DE, Bachmann MF. COVID-19: Mechanisms of vaccination and immunity. *Vaccines (Basel).* 2020;8(3):404. doi:10.3390/vaccines803040
9. Jayadevan R, Shenoy R, Ts A. Survey of symptoms following COVID-19 vaccination in India. *medRxiv.* 2021. doi:10.1101/2021.02.08.21251366
10. Gee J, Marquez P, Su J, et al. First month of COVID-19 vaccine safety monitoring – United States, December 14, 2020–January 13, 2021. *MMWR Morb Mortal Wkly Rep.* 2021;70(8):283–288. doi:10.15585/mmwr.mm7008e3