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Original Research Article

Potential concerns and challenges toward anti-SAR-CoV-2 vaccine among undergraduate students of north India

Rakhi Mishra[1], Hem Lata[2]*, Sonia[3], Santosh Kumar[4], Seeta Devi[5]

[1]College of Nursing, All India Institute of Medical Sciences, Rishikesh, Uttarakhand, India
[2]College of Nursing, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India
[3]College of Nursing, All India Institute of Medical Sciences, Raebareli, Uttar Pradesh, India
[4]Department of Community and Family Medicine, All India Institute of Medical Sciences, Rishikesh, Uttarakhand, India
[5]College of Nursing, Symbiosis College of Nursing, Pune, Maharashtra, India

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***Correspondence:**
Dr. Hem Lata,
Email: hemlata19.sadhanu@gmail.com

ABSTRACT

Background: SARS-CoV-2 has trampled the healthcare system during the pandemic and still frames distressed pictures of quarantine, isolation, and vaccine hesitancy. Hence, the present study was conducted at a tertiary care hospital in Uttarakhand to address the paucity of data regarding concerns and challenges in accepting the anti-SAR-CoV-2 vaccine among medical and nursing students.
Methods: An online survey was conducted via the Google platform using Google forms. A total of 248 undergraduate medical and nursing students who were selected via the non-probability.
Results: The mean age was 22.0±3.6 years. Of them, 58% were B.Sc. nursing students, and 42% were MBBS/DNB students. About 85% agreed that the COVID-19 vaccine was safe and were psychologically prepared for minor signs and symptoms after vaccination. About 23% were worried about the hormonal changes that may occur after getting vaccinated. Nearly one third (37%) had concerns about hospital admission and expenses in case of any adverse events. Overall, 56% had accepted the SARS-CoV-2 vaccine.
Conclusions: Although the acceptance rate was high among participants, a few concerns and challenges reported by participants cannot be overlooked. Hence, there is a need to continuously address the concerns to improve the rate of adherence and to further psychologically prepared for the minor signs and symptoms after vaccination SARS-CoV-2.

Keywords: Acceptance, COVID-19, SAR-CoV-2, Students, Vaccine

INTRODUCTION

SARS-CoV-2 has trampled the healthcare system during the pandemic and still frames distressed pictures of quarantine, isolation, and vaccine hesitancy. At one point in time, the Anti-SAR-CoV-2 vaccine reminded us of the polio immunization in India, which poses a similar threat and challenges to health functionaries and beneficiaries to eliminate polio from the country. Approximately 200 vaccine candidates underwent preclinical trials and evaluations in December 2020.[1] Furthermore, the Food and Drug Administration (FDA) and the World Health Organization (WHO) approved the emergency use authorization to roll out the global threat caused by SARS-CoV-2 on October 6, 2020.[2] Vaccines are highly effective in curtailing serious cases of SARS-CoV-2 and are pivotal to managing the COVID-19 pandemic.[3] India implemented the world's largest COVID-19 vaccination drive across 3006 vaccine centres on January 16, 2021.[4] Despite widespread availability, evidence shows vaccine hesitancy among the public.[5-7] Research and media reports have indicated considerable hesitancy towards COVID-19 vaccines among the public, which was identified as a salient contributor to reduced vaccine uptake rates.[5]

Unvaccinated healthcare professionals (HCPs) face patients around the clock and pose a threat to patients and other healthcare workers as well as the healthcare system. Hence, HCPs were recognized as priority groups for providing vaccination due to the limited supply at initial stages.[8] However, with advanced knowledge and previous vaccination habits, data showed hesitancy regarding vaccines among HCPs.[8] Notably, medical and nursing students provided back-up support during the time of crisis, significantly contributed to the healthcare system, and are at risk of contracting COVID-19. Therefore, vaccinating students is also of utmost importance. Findings revealed significantly higher positive perceptions toward COVID-19 vaccines among medical students than nursing students.[9] Furthermore, a study conducted among undergraduate nursing students showed a favourable attitude toward vaccination, yet it needs efforts to get maximum coverage.[10] Hence, to address the paucity of data regarding concerns and challenges in acceptance of the Anti-SAR-CoV-2 vaccine among medical and nursing students, the present study was conducted at a tertiary care hospital in Uttarakhand to assess the concern and challenges towards the Anti-SAR-CoV-2 vaccine among undergraduate students.

METHODS

Study design, study population, validation and link

An online survey was conducted via the Google platform using Google forms. A total of 248 undergraduate medical and nursing students who were selected via the non-probability convenience and snowball sampling technique participated in the online survey. The pre-validated questionnaire was adapted for the survey, and the reliability of the questionnaire was assessed to assess potential concerns and challenges towards Anti-SAR-CoV-2 vaccination (r=0.78) by Cronbach's alpha. A survey link (https://forms.gle/iHr5j8fMRBGz5ZuM7) was shared with students on WhatsApp, followed by a personal e-mail requesting participation.

Sampling technique and inclusion criteria

In addition, a snowball sampling technique was used to reach out to participants by encouraging respondents to forward or share the online survey link with other participants. This approach was adopted because of the existing nature of the pandemic.

Inclusion criteria for participation in the study were students who were 1) perusing undergraduate courses in medical and nursing, 2) able to read and write English, and 3) have access to smart phone.

The survey link was left open from 03 August 2021 to 19 October 2021 for data collection, and the final analysis was done after closing the link. This time was chosen intentionally as more of the concern were raised related to the vaccine availability.

The questionnaire

The questionnaire has two sections. Section A: socio-demographic data part I: it consists of information regarding age, gender, educational qualification, area of work and place of work, and history of COVID-19 part II: it consists of information regarding vaccination, i.e., vaccine received, type of vaccine, dose, screening before vaccination, untoward reaction after vaccination, duration of untoward reaction, reporting of untoward events after vaccination. Section B: to assess the potential concerns and challenges towards anti-SAR-CoV-2 vaccination, a 3-point Likert scale (disagree, neutral, and agree) was used. It consists of 10 items. The maximum score was 30, and the minimum score was 10.

Statistical analysis

The statistical analysis data was analysed using IBM SPSS Statistics for Windows, version 23.0. Armonk, NY: IBM Corp. Descriptive statistics were used to present the data in terms of frequency and percentage. However, inferential Chi-square statistics were used to determine the association between concern, challenges, and acceptance of the anti-SAR-CoV-2 vaccine among undergraduate students. The significance level was set at $p<0.05$ at a confidence interval of 95%.

Ethics approval and consent to participate

The present study was conducted in accordance with the principles of the Declaration of Helsinki and approved by the Institutional Ethics Committee of AIIMS, Rishikesh (Letter No-AIIMS/IEC/21/400, dated July 16, 2021). All participants provided informed consent before participation.

RESULTS

Socio-demographic characteristics

The study included 248 participants with an age range of 18 to 35 years. The mean age was 22.0±3.6 years. The study participants included 144 (58%) B.Sc. Nursing students and 104 (42%) MBBS/DNB students. About 216 (87%) had a positive history of COVID-19 in the past, and 242 (97%) received the vaccine against SARS-CoV-2. Further, 223 (92%) received both doses of vaccination, and among the 223, 210 (87%) preferred Covishield. Screening before vaccination was done by HCP for 199 (82%). The reason of Covishield preference is availability of this vaccine in that period of vaccination in our settings.

Surprisingly, 43 (18%) reported no screening by the HCP before vaccination. 172 (71%) reported minor symptoms after vaccination. However, 4 (2%) reported severe post-vaccination adverse reactions and reported vaccination centre 2 (50%), followed by helpline/ADR reporting centre 01 (25%), and physician 01 (25%), respectively (Table 1).

Table 1: Socio-demographic profile of the participants (n=248).

Socio-demographic characteristics	N (%)
Age (in years)	
18-23	209 (84.3)
24-29	26 (10.5)
30-35	13 (5.2)
Gender	
Female	184 (74.2)
Male	64 (25.8)
Professional course	
B.Sc. Nursing	144 (58.0)
MBBS	104 (42.0)
Educational institution	
Government	230 (93.0)
Private	18 (7.0)
History of COVID-19	
Yes	216 (87.0)
No	32 (13.0)
Received vaccine	
Yes	242 (97.0)
No	05 (2.0)
Contraindicated	01 (1.0)
Dosage (n=242)	
1st dose	19 (8.0)
Both dose	223 (92.0)
Type of vaccine (n=242)	
Covishield	210 (87.0)
Covaxin	32 (13.0)
Screening before vaccination by HCP (n=242)	
Yes	199 (82.0)
No	43 (18.0)
Minor reactions post-vaccination	
Yes	172 (71.0)
No	70 (29.0)
Severe post-vaccination adverse reaction	
No	238 (98.0)
Yes	04 (2.0)
Reporting person/department after severe post-vaccination adverse reaction (n=4)	
Helpline/ADR reporting centre	01 (25.0)
Vaccination center	02 (50.0)
Physician	01 (25.0)

Concerns and challenges towards the SAR-CoV-2 vaccine

Data showed that the majority 211 (85%) of participants agreed that the COVID-19 Vaccine is safe. However, 10 (4%) disagreed. Considering the severity, only 18 (7%) reported that they may get a COVID-19 infection after vaccination, but the severity will be less. About one fourth (23%) of participants were worried regarding the hormonal changes that may occur after getting vaccinated. Only 4% reported that they feel safe, if screened by a physician for any possible contraindications before getting vaccinated. Further, 210 (85%) were not psychologically prepared for minor signs and symptoms after vaccination and gave consent for the same. To the surprise about 181 (73%) reported that they were not provided with a toll-free number to report any adverse event after vaccination, and nearly half (50%) reported that they were not informed that the AEFI team would follow up in case of adverse events. Furthermore, 95 (38%) participants were found to be neutral regarding the future dose of vaccine with the same brand, whereas 82 (33%) disagreed and 71 (29%) agreed about the concern. The majority, 103 (42%), agreed that they are worried that if they do not carry ID proof, they will not receive the vaccine. Considering the adverse event, 92 (37%) had concerns related to hospital admission and expenses in case they had any adverse event (Table 2).

Table 2: Concern and challenges towards SAR-CoV2 vaccine (n=248).

Item no.	Statements	Agree	Neutral	Disagree
		N (%)	N (%)	N (%)
1	I think COVID-19 vaccine is safe	211 (85.0)	27 (11.0)	10 (4.0)
2	I think I may get COVID-19 infection after vaccination but the severity will be less.	18 (7.0)	34 (14.0)	196 (79.0)
3	I am worried that I may have hormonal changes after vaccination. *	58 (23.0)	82 (33.0)	108 (44.0)
4	I feel safe because I will be screened by a Physician for any contra-indication before vaccination.	11 (4.0)	51 (21.0)	186 (75.0)
5	I was psychologically prepared for minor signs and symptoms that may appear post-vaccination and consent was taken.	08 (3.0)	30 (12.0)	210 (85.0)
6	I was provided with the Toll-free number for reporting Adverse events post-vaccination by the physician/nurse.	27 (11.0)	40 (16.0)	181 (73.0)
7	I was informed that the AEFI (adverse event following immunizations) team will follow up immediately in case of reporting adverse events.	18 (7.0)	107 (43.0)	123 (50.0)
8	I am concerned if I will get a future dose of the vaccine with the same brand name. *	71 (29.0)	95 (38.0)	82 (33.0)
9	I am worried that if I do not carry ID proof, I will be not given the next date for vaccination. *	103 (42.0)	86 (34.0)	59 (24.0)
10	I am worried that if I had adverse events after vaccination and got admitted, who will bear my expenses or I will get compensation or not *	92 (37.0)	93 (37.0)	63 (26.0)

Note: *-Negative statement.

Table 3: Association between potential concern and challenges and acceptance towards SAR-CoV-2 vaccine.

Statements	Acceptance of SAR-CoV2 vaccine		P value
	No (n-110) N (%)	Yes (n-138) N (%)	
I think the COVID-19 vaccine is safe			
Agree	103 (93.6)	107 (77.5)	0.02
Neutral	06 (5.4)	21 (15.2)	
Disagree	01 (0.9)	10 (7.3)	
I think I may get covid-19 infection after vaccination but the severity will be less.			
Agree	102 (92.8)	94 (68.1)	0.000
Neutral	5 (4.5)	29 (21.0)	
Disagree	3 (2.7)	15 (10.9)	
I am worried that I may have hormonal changes after vaccination. *			
Agree	75 (68.2)	33 (23.9)	0.000
Neutral	24 (21.8)	58 (42.0)	
Disagree	11 (10.0)	47 (34.1)	
I feel safe because I will be screened by a Physician for any contra-indication before vaccination.			
Agree	97 (88.1)	89 (64.5)	0.000
Neutral	11 (10.0)	40 (29.0)	
Disagree	2 (1.9)	9 (6.5)	
I was psychologically prepared for minor signs and symptoms that may appear post-vaccination and consent was taken			
Agree	106 (96.3)	104 (75.4)	0.000
Neutral	3 (2.7)	27 (19.6)	
Disagree	1 (0.9)	7 (5.0)	
I was provided with the Toll-free number for reporting Adverse events post-vaccination by the physician/nurse.			
Agree	101 (91.8)	80 (58.0)	0.000
Neutral	4 (3.6)	36 (26.0)	
Disagree	5 (4.5)	22 (15.9)	
I was informed that the AEFI (adverse event following immunizations) team will follow up immediately in case of reporting adverse events.			
Agree	66 (60.0)	57 (41.3)	0.011
Neutral	39 (35.4)	68 (49.2)	

Continued.

Statements	Acceptance of SAR-CoV2 vaccine		P value
	No (n-110) N (%)	Yes (n-138) N (%)	
Disagree	5 (4.5)	13 (9.4)	
I am concerned if I will get future dose of vaccine with same brand name. *			
Agree	70 (63.6)	12 (8.6)	0.000
Neutral	28 (25.4)	67 (48.5)	
Disagree	12 (10.9)	59 (42.7)	
I am worried that if I do not carry ID proof, I will not be given next date for vaccination. *			
Agree	46 (41.8)	13 (09.4)	0.000
Neutral	29 (26.3)	57 (50.7)	
Disagree	35 (31.8)	68 (49.2)	
I am worried that if I had adverse events after vaccination and got admitted, who will bear my expenses or I will get compensation or not *			
Agree	52 (47.2)	11 (7.9)	0.000
Neutral	36 (31.7)	57 (41.3)	
Disagree	22 (20.0)	70 (50.7)	

Note: *-Negative statement.

Association between potential concern, challenges, and acceptance of the SAR-CoV-2 vaccine

Out of the 248 students who participated in the study, more than half (56%) had accepted the SAR-CoV-2 vaccine. However, 44% were not fully agreeable to vaccination. Data showed a significant association with potential concern, challenges, and acceptance of the SAR-CoV-2 vaccine among undergraduate students at $p<0.05$ at a confidence interval of 95% (Table 3).

DISCUSSION

The present study assessed the potential concerns and challenges in accepting the SARS-CoV-2 vaccination among medical and nursing students at tertiary care hospitals. Most participants were shown as females, and the age group was 18-35 years. On the contrary, the study by Abd Elgalil et al in Egypt and Raja et al in Sudan was conducted among participants in the age group of 18-25 years. However, the similarity was in gender, as participation was more from the female gender.[9] The present study showed that most (97%) participants received the vaccine against SARS-CoV-2, and 87% preferred Covishield. Similar findings were reported by Jain et al.[11] Adverse events after the SARS-CoV-2 vaccination can be presented as local side effects, systemic side effects, and other side effects such as allergies. Moreover, these adverse reactions can vary in severity, ranging from mild to moderate, without interference in individual daily activities or, very rarely, death.[12] In the present study, 71% of participants reported minor symptoms after vaccination, whereas only 2% reported severe post-vaccination adverse events. Contradictory to the present findings, a study conducted by Parida et al reported at least one adverse event following vaccination in 29.8% of participants. However, no severe adverse events were reported after the vaccination.[13] Another study also reported minor adverse events after vaccination: local tenderness (39.3%) after the first dose of Covaxin and fever (30.5%) after the first dose of Covishield. Adults' willingness to get vaccinated ranged from 28.4% to 97%.[14]

In the present study, 85% of participants agreed that the SARS-CoV-2 vaccine was safe. One of the reasons could be the positive attitude towards prevention and association with the medical profession. In contrast, a study conducted by Nemr et al. reported that only 32.8% of HCPs believed that the SARS-CoV-2 vaccine was safe.[15] Another study conducted by Pragya et al reported that only 40.4% of participants believed that the vaccine protected against SARS-CoV-2. However, the acceptance rate was 67.7%, and most participants (56.2%) received two vaccine doses.[14] The acceptance rate was higher among direct medical care providers (49%), doctors (64.7%), and medical students (63.7%) as compared to nurses.[16] Surprisingly, nurses declared distrust (46.6%) towards SARS-CoV-2 vaccines.[17] However, another study conducted by Agyekum et al. reported opposite findings and revealed that the majority (64.5%) of healthcare workers were unwilling to accept the SARS-CoV-2 vaccines due to concerns about the safety of the vaccines.[18] Considering the severity after vaccination, only 7% reported they may get infected even after vaccination, but the severity will be less. While in contradiction the findings were reported in a qualitative study conducted by Herry et al. in Grenada.[19] Where, most participants (85%) were psychologically prepared for minor symptoms after vaccination. Findings revealed by Anil et al showed 86% of participants were anxious about the side effects or adverse reactions after vaccination.[20] In this study, 23% of participants were worried about the hormonal changes that may occur after vaccination. The findings corroborate a study conducted by Aljehani et al, in which study participants reported menstrual changes after getting the first dose of the SARS-CoV-2 vaccination (41.7%) and the second dose (44.1%).[21] However, in contrast, meta-analysis study findings revealed no association between COVID-19 vaccines and fertility impairment in men or women.[22] Our findings showed participants (37%) concerns related to hospital admission and expenses

following the adverse event. However, a study conducted by Alnemari et al revealed a low hospital admission rate among the vaccinated group (2.3%).[23] Morales et al found that the median length of stay in the hospital was 3 days among patients admitted after the first or second dose.[24] Relevant information was observed in the current study, and the participants came out to have unique concerns and challenges related to post-vaccination compensation or expenses if they developed adverse effects. However, WHO has introduced the COVAX no-fault compensation program. The program provides fair, no-fault, lump-sum compensation to eligible individuals who suffer certain serious adverse events after receiving the SARS-CoV-2 vaccine.[25] The majority (42%) agreed that they are worried that they will not receive the vaccine if they do not carry ID proof. However, the directives from the Government of India mandate all the beneficiaries to register on the CoWIN app portal with a valid identity card and mobile number to get vaccinated. After the vaccine inoculation, the beneficiary usually gets a message about the successful SARS-CoV-2 vaccination and a link to download the vaccination certificate, thereby preventing the fake SARS-CoV-2 vaccination scam.[26]

The present study revealed that 33% of participants disagreed regarding the future dose of vaccine with the same brand. The study's findings are contradictory with Qin et al and Tharwat et al showing a willingness to receive SARS-CoV-2 vaccine booster shots (82.8%) and (31.9%), respectively.[27,28]

The data showed that 71% of participants reported minor symptoms after vaccination. 2% of participants reported severe adverse events and reported them to AEFI. The study findings of Paridha et al showed that 29.8% of samples reported at least one of the AEFI. However, no severe adverse events were reported, and about 1.6% had moderate AEFI.[13] The present study's findings showed a significant association between concern and challenges and SAR-COV-2 vaccination acceptance. The results of a study conducted by Khankeh et al identified a good proportion of participants who reported their willingness to receive the SARS-CoV-2 vaccine. Another study by Syed et al. reported a high acceptance rate (83.3%). However, the acceptance was mainly due to side effects, safety, lack of information, and effectiveness related to the SARS-CoV-2 vaccine.[29]

Data collection occurred online, with only one subset of the population residing in a single geographic area, which means we may not have reached vulnerable groups, which might impact the generalization of the survey results.

CONCLUSION

The acceptance rate of the SARS-CoV-2 vaccine was high. However, one cannot overlook the concerns and challenges reported by participants. The government of India is continuously making efforts to address the concerns reported by the citizens and meticulously implementing the nationwide SARS-CoV-2 vaccination awareness program through campaigns and government portal websites, thereby trying to improve the acceptance and adherence rate among the public.

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