

Hesitation, Delays and Barriers towards COVID-19 Vaccination among Educated Class in Northern India

Ananya Ray Laskar¹, Shyambhavee Behera², Aditi S Poddar³, SK Rasanania⁴, SS Saha⁵

¹ Associate Professor, Department of Community Medicine, Lady Hardinge Medical College, New Delhi & former MPH coordinator, National Centre for Disease Control

² Senior Resident, Department of Community Medicine, University College of Medical Sciences, Delhi

³ Educationist, The Modern School, Faridabad & former faculty in British School of Languages, South Ex Delhi

⁴ Director, Professor & Head, Department of Community Medicine, Lady Hardinge Medical College, New Delhi

⁵ Ex- Director Directorate Health Services of Delhi & Ex-Medical Superintendent (GB Pant Hospital) Delhi.

Correspondence : Dr. Shyambhavee Behera, Email: shyambhavee@gmail.com

Abstract:

Introduction: Vaccine hesitancy has emerged as one of the leading global health threats as identified by WHO, that may be detrimental to efforts to control the pandemic. Frequent interruptions in the vaccine supply clubbed with hesitancy can result in lower immunization coverage than expected. Assessing factors influencing the behavioural decision to accept, delay or reject is imperative in scaling-up the vaccine uptake.


Objectives: To estimate the delay and its determinants towards COVID-19 vaccination among educated class in Northern India. **Method:** An online cross-sectional, observational study was conducted among teachers and their family members, close relatives and friends across India among 362 adults aged 18 years or more using structured questionnaire incorporated into kobo toolbox wherein information pertaining to vaccination hesitancy among study subjects was sought. **Results:** The present study revealed 43% of participants were totally unvaccinated. Most common barriers towards delayed or non-vaccination included apprehension about the side effects, doubts regarding vaccine effectiveness. **Conclusion:** Risk communication and vaccine advocacy should be tailor-made in a manner to dispel all doubts and concerns of the general public and counter the misinformation, which will help in addressing this huge vaccination gap.

Keywords: Barriers, COVID-19, Delay, Vaccine hesitancy

Introduction:

Immunization has proved to be the most cost-effective preventive interventions amongst all the methods of fighting the pandemic. Many countries have successfully developed vaccination programs against COVID-19; as of 14th May 2021, there were 180 vaccines in pre-clinical development and 100 vaccines in clinical development.^[1] But vaccine

development alone can't help battle the pandemic. Vaccine acceptance among the general public and healthcare workers appears to have a decisive role in the successful control of the pandemic.^[2] As defined by World Health Organization (WHO) Strategic Advisory Group of Experts on Immunization (2015), "Vaccine hesitancy" refers to delay in acceptance or refusal of vaccination despite availability of

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	Laskar AR, Behera S, Poddar AS, Rasanania SK, Saha SS. Hesitation, Delays and Barriers towards COVID-19 Vaccination Healthline. 2021; 12(4): 94-99.
	DOI : 10.51957/Healthline_275_2021	

vaccination services. Vaccine hesitancy is complex and context specific, varying across time, place and vaccines.^[3]

India started the vaccination for COVID 19 on 16th January, 2021 among the healthcare workers (HCW), closely followed by Frontline Workers (FLW). Subsequently the vaccines were introduced in a phased manner for 60 years and above, 45 years and above and subsequently for all the adults in the age range of 18-44 years by May 2021.

Vaccine hesitancy has emerged as one of the leading global health threats as identified by WHO, that may be detrimental to efforts to control the pandemic.^[4] Frequent interruptions in the vaccine supply clubbed with hesitancy can result in lower immunization coverage than expected. Assessing factors influencing the behavioural decision to accept, delay or reject is imperative in scaling-up the vaccine uptake. The rationale for conducting this study was dearth of literature on COVID-19 vaccine hesitancy acceptance in India among general public, the current study targets this population to analyse the burden of COVID-19 vaccine hesitancy among educated class of ≥ 18 years population and understand the reason behind their hesitancy.

Method:

An online cross-sectional, observational study was conducted among teachers and their family members, close relatives and friends across India among adults aged 18 years or more, who were willing to participate in the study during the study period. Participants who were part of any past COVID-19 vaccine trials conducted for the two vaccines (Covaxin and Covishield), and those who were not eligible for COVID-19 vaccination due to recent infection or any medical condition were excluded from the study.

Sample size

Sample size was calculated using the formula $n = Z^2 * P * (1 - P) / e^2$, where Z= value from standard normal distribution corresponding to desired

confidence level (with $z=1.96$ for 95% CI), P= prevalence of the outcome variable, e= allowable absolute error. The prevalence of vaccine hesitancy was taken as 39%, which was taken from the report of fourth round of Delhi NCR Coronavirus Telephone Survey.^[5] A sample size of 365 was calculated with a 5% of allowable absolute error.^[5]

Data Collection tool

Data was collected using pre-tested, validated, self-administered questionnaire. A structured questionnaire incorporated into kobo toolbox wherein information pertaining to vaccination hesitancy among study subjects was sought. Socio-demographic information, vaccination category/age bracket, co-morbidity was collected. Reasons for vaccine hesitancy/delay and related concerns were ascertained.

Data Collection

Protocol and proforma was circulated in the first week of June 2021. The study participants were given a time period of 25 days to fill the forms after circulation. Convenience sampling method was used for the purpose of data collection. The online questionnaire in kobotool box was circulated among official social media platforms of groups of teachers of three selected private schools of Delhi NCR and Faridabad region and further circulated among their family members, close friends and relatives (≥ 18 years) residing across India. As teachers and their family members represent an educated middle-class section of the population and are expected to be less hesitant as has been reported by a study by Handebo Set al,^[6] hence this group was chosen for the study.

Data analysis

Data was analysed using Statistical Package for the Social Sciences (SPSS) software version 20 (IBM Corp, Armonk, NY, USA). Descriptive data was reported as proportions and means, for categorical and continuous data, respectively. Bivariate analysis was done using chi-square statistics (Fischer exact, where applicable) for categorical outcome variables.

Ethical consideration

Strict confidentiality, privacy of data, anonymity and freedom of expression was ensured throughout the study. In built informed consent was taken, no intervention, sampling or disclosure of sensitive information was involved in this study.

Result:

Overall, 367 responses were received, out of which five responses were excluded for the purpose of data analysis, in view of incomplete information. Thus, 362 study participants were included for the purpose of analysis. More than half of the study participants (56.6%) had received at least one dose of either of the two vaccine and 43.4% were unimmunized. Most of the participants were graduates (43.6%) followed by post graduates (26.2%) and higher secondary pass (20%). Figure 1 shows state-wise distribution of study participants. Distribution of study participants among the various categories is depicted in Table 1.

Vaccine preference and uptake by the study participants

Almost 70% of the study participants preferred Covishield and 20% preferred Covaxin. However, 13 participants wanted to wait for other new upcoming vaccine and two had not decided regarding any vaccine preference. However, a delay of more than 2 months in getting the first dose vaccine was reported by majority (52.2%) of those who were vaccinated. It was noteworthy that the delayed vaccination was also reported by 18 (16.8%) HCWs and 3 (2.8%) FLWs.

Barriers towards delay or non-vaccination for COVID-19

Among the participants who were not vaccinated, most common reason was apprehension about the side effects (40.8%), followed by doubts regarding vaccine effectiveness (33.8%). More than 50% of the study participants were not sure of efficacy of the current vaccine against newer variant.

Among the participants who reported delayed vaccination, most common reason for delayed vaccination was doubts regarding vaccine effectiveness (52.3%) followed by apprehension about the side effects (48.6%). (Figure 2) Other reasons included perception regarding people getting infection even after vaccination, fear regarding getting infected while waiting for vaccination in the observation area and lack of faith in Indian vaccine. Few participants (35%) felt that the vaccines may be harmful if given during menstruation. In their opinion some of the special groups such as < 5 children and pregnant women should not be given the vaccines. Table 2 shows perception of study participants regarding vaccination among special groups. The sources that influenced the opinion of the participants were whatsapp and other social media (39%) and only 21% consulted the credible sources like online government documents available on official websites.

Discussion:

Vaccine acceptance among the educated class, may cast a powerful impact in the minds of lesser educated and marginalized sections of the general population. The current study was designed to determine the proportion of those who were unvaccinated or delayed their vaccination and explored the reasons and factors responsible for the above.

A systematic review revealed that the overall percentage of vaccine acceptance was not satisfactory; excluding few studies which reported higher acceptance (86.1% among students and 77.6% in general population).^[7] As per the 4th round of Delhi NCR Coronavirus Telephone Survey (DCVTS-4) the vaccine hesitancy in Delhi NCR region was 39%, while 15% were unsure about taking the vaccine.^[5] The present study revealed 43% of participants were totally unvaccinated. Vaccine hesitancy showed a declining trend among Americans over time (from 38% to 32% in in

Table 1: Association between vaccination status and sociodemographic characteristics among the study participants

Variables		Completely Unvaccinated (n=157)	Vaccinated (n = 205)	Total number of study participants (n=362)
Categories as per introduction of vaccination	Adults (18-44 years)	88 (53.0%)	78 (47.0%)	166 (45.8%)
	Adults (45-59 years)	45 (44.1%)	57 (55.9%)	102 (28.2%)
	Adults (≥60 years)	24 (38.7%)	38 (61.3%)	62 (17.1%)
	HCWs / FLWs	0	32 (100%)	32 (06.9%)
	p-value	<0.001		
Gender	Female	104 (50.7%)	101 (49.3%)	205 (56.6%)
	Male	53 (33.8%)	104 (66.2%)	157 (43.4%)
	p-value	0.001		
Nature of job	Employed	67 (34.9%)	125 (65.1%)	192 (53.0%)
	Unemployed#	90 (65.2%)	48 (34.8%)	138 (38.1%)
	HCWs/ FLWs	0	32 (100%)	32 (08.8%)
	p-value	<0.001		
HCW: Healthcare workers; FLW: Frontline workers #Students, retired professionals, homemakers & currently unemployed.				

Table 2: Perception of study participants regarding vaccination during specific conditions

Name of Special groups	No. of subjects who felt they should not be vaccinated
Pregnant women	192 (53.0%)
<5 years old children	165 (45.6%)
Breast -feeding women	102 (28.0%)
5-12 years	75 (20.7%)
Teenagers	52 (14.3%)
Immuno-compromised patients (cancer)	35 (9.6%)

2020).^[8] A global study on Vaccine Acceptance revealed significantly higher vaccine acceptance among older age group, which was in concordance with the present study too.^[9]

Confidence, complacency and convenience were proposed to be the determinants of vaccine hesitancy by the WHO EURO Vaccine Communications Working Group (3 Cs' model).^[3] Confidence entails trust in the effectiveness and safety of vaccines, reliability and

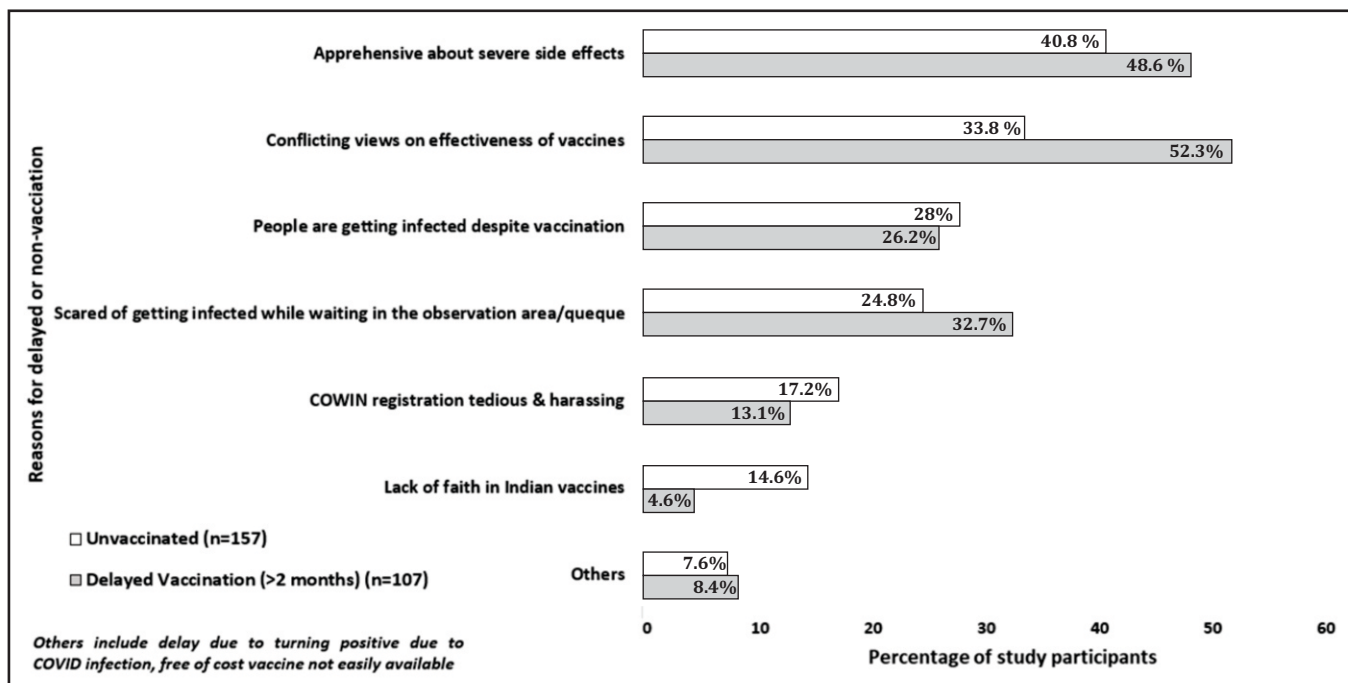
competence of the health services. In the present study majority of the unvaccinated participants expressed low confidence levels due lack of transparency and conflicting information about the effectiveness of vaccines.

Vaccination complacency coexists with low or no perceived risks of acquiring COVID-19 and is influenced by many factors such as lifestyle, responsibilities in life and absence of disease

Figure 1: Tree map showing distribution of study participants according to the state of residence

Delhi & NCR Region; 105 (29%)	Haryana; 68 (18.8%)	Punjab; 45(12.4%)	Maharashtra; 25(6.9%)	West Bengal; 23(6.4%)	
		Uttar Pradesh; 40 (11%)	Karnataka; 18 (4.9%)	Andhra Pradesh; 10 (2.7%)	
			Tamil Nadu; 12 (3.3%)	Rajasthan; 6 (1.6%)	Madhya Pradesh; 6 (1.6%)
				Assam; 4(1.2%)	

Figure 2: Reasons for delayed/ no vaccination among study participants



occurrence among family members. The present study took a note of several concerns and opinions expressed by the participants. Lower level of complacency in the current study could be attributed to info-demic, misinformation and misconceptions spread by social media channels and evolving government guidelines and advisories.^[9] Some participants in the study even had misconceptions with regards to harm being caused by vaccine if taken

during menstruation and the potential of the vaccine causing genetic modifications. There was a significant hesitation among the participants to vaccinate their children in a study conducted in Turkey.^[10]

Another crucial factor is vaccination convenience denoted by physical availability, geographical accessibility, affordability and willingness-to-pay and other factors like registration

system. In the present study the degree of hesitancy varied across categories of vaccination depending on the ease of registration in COWIN platform. A huge chunk of 18-45 years reported harassment and delay in COWIN registration due to availability of limited slots for this age group.

One of the limitations of this study was that the pregnant and the lactating women were excluded from the study owing to which their perception and concerns could not be captured. Another major limitation is the time period of conduct of the study. There was wider availability and accessibility of free vaccine for general public subsequent to the study.

Conclusion and recommendations:

The present study observed a substantial proportion of the study participants (56.6%) had received at least one dose of either of the two vaccines. The prominent barriers noted were apprehension about side effects and doubts about vaccine effectiveness. Therefore in order to contain biological contagions of any novel pandemic, general public requires transparency in risk communication and reassurances from credible sources such as government public health bodies and make concerted efforts in curbing panic. Risk communication and vaccine advocacy should be tailor-made in a manner to dispel all doubts and concerns of the general public and counter the misinformation. Patients approaching the health care facilities for regular check-ups or routine immunization may be approached for motivational interviewing to get vaccinated against COVID-19.

Declaration:

Funding: Nil

Conflict of interest: Nil

References:

1. COVID-19 vaccine tracker and landscape [Internet]. World Health Organization. [cited 14th May, 2021]. Available from: <https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines>
2. Sallam M. COVID-19 vaccine hesitancy worldwide: a concise systematic review of vaccine acceptance rates. *Vaccines*. 2021 Feb;9(2):160.
3. MacDonald NE. Vaccine hesitancy: definition, scope and determinants. *Vaccine*. 2015;32(34):4161-4.
4. World Health Organization. Ten threats to global health in 2019 [Internet]. World Health Organization. [cited 23rd April, 2021]. Available from: <https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019>
5. The National Council of Applied Economic Research. Round 4 of the Delhi NCR Coronavirus Telephone Survey. [Internet]. NCAER. [cited 15th May, 2021]. Available from: https://www.ncaer.org/image/userfiles/file/DCVTS4/DCVT S4_Press_Release.pdf
6. Handebo S, Wolde M, Shitu K, Kassie A Determinant of intention to receive COVID-19 vaccine among school teachers in Gondar City, Northwest Ethiopia. *PLoS ONE* 2021, 16(6): e0253499. [cited 28th Oct, 2021]. Available from: <https://doi.org/10.1371/journal.pone.0253499>
7. Troiano G, Nardi A. Vaccine hesitancy in the era of COVID-19. *Public Health*. 2021;194:245-51.
8. Nguyen KH, Srivastav A, Razzaghi H, et al. COVID-19 vaccination intent, perceptions, and reasons for not vaccinating among groups prioritized for early vaccination — United States, September and December 2020. *MMWR Morb Mortal Wkly Rep*. 2021;70:217-222.
9. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K, et al. A global survey of potential acceptance of a COVID-19 vaccine. *Nature medicine*. 2021;27(2):225-8.
10. Ikisiik H, Sezerol MA, Tasci Y, Maral I. COVID-19 vaccine hesitancy: A community-based research in Turkey. *Int J Clin Pract*. 2021;00:e14336.