Original Article

Descriptive cross-sectional study to evaluate perception, attitude, and practice of parents regarding COVID-19 vaccination in children 10–12 years of age—A step toward prevention of future COVID-19 outbreaks in India

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Abstract

Purpose: COVID-19 was declared a global pandemic and all age groups were equally affected. Coronavirus had devastating effects worldwide due to the emergence of new variants till vaccination was adopted to eradicate the transmission of the virus and restore normalcy. However, children were not included in the initial phase of vaccination. The purpose of the study was to assess the level of perception, attitude, and practice among parents toward the COVID-19 vaccination drive in children 10–12 years of age. **Design and Study:** The present research is a cross-sectional questionnaire-based survey including parents of children aged 10–12 years as participants. The survey was conducted between May 2022 and July 2022 with a sample size of 320. **Results:** A high willingness (80%) among parents was found for getting their children vaccinated. COVID-19 vaccines were perceived to be safe by the parents (59%) and efficacious (75%) for their children. Parents (67%) felt that the benefits of getting their children vaccinated against COVID-19 prevail over the risks of the vaccine. Parents 214 (67%) feel the need of getting their child vaccinated for sending them to school followed by availing of daycare facilities after school 54 (17%) among working parents. A significant association ($P < 0.05$) was seen between the variables of practice being followed by parents and their children as per COVID-19 norms. Parent's negative attitude toward COVID-19 vaccination was associated with availability of no/unclear safety information (36%), fear of adverse effects of vaccine (3%), and false belief of having long-term immunity due to natural infection (32%). The positive attitude of parents was due to trust in positive information/news about the vaccine (42%), belief in the safety and efficacy of the vaccine (5%), acceptability for mild adverse effects (1%), and the necessity of vaccine to send children to schools (1%). **Conclusion and Recommendations:** The awareness of parents regarding COVID-19 vaccination for children was limited, high level of acceptance for vaccination was seen in our study. We recommend to continuing educational programs through mass campaigns to increase increasing awareness among parents for getting COVID-19 vaccination for their children. Vaccine hesitancy including vaccine safety concerns of parents should be addressed by presenting myths and facts related to COVID-19 vaccine using television, radio, and social media platforms.

Keywords: COVID-19, COVID-19 awareness, parent's perception, vaccination, vaccine-hesitancy

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Introduction

On January 30, 2023, WHO designated COVID-19 as a Public Health Emergency of International Concern (PHEIC). Over the past three

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years, coronavirus has evolved leading to the emergence of new variants with devastating effects worldwide.[1] Populations of all age groups have been affected, and children are no exception. Vaccination has played a vital role in controlling the spread as well as the severity of the virus across the globe in all age groups including children.[2]

In a recent development, during a fifteenth meeting of the International Health Regulations (2005) (IHR) Emergency Committee held on May 4, 2023, regarding the COVID-19 pandemic, WHO declared the end of the global Health emergency and emphasized on the long-term management of COVID-19. It was recommended to integrate COVID-19 vaccination into life course vaccination programs so as to augment the coverage of COVID-19 vaccination for all people in the high-priority groups. WHO advised addressing vaccination acceptance and demand issues with the relevant communities aggressively in the future across the globe.[3]

However, in India, vaccination in children and adolescents was not prioritized during peak COVID-19 infections due to poor vaccine supply. Schools were shut down during COVID-19 waves in the country. It should be noted that children and adolescents experienced the same rates of infection as other age groups in the population and are considered to be an important source of infection for family members and individuals in the community.[2] It is necessary that a balanced approach is adopted to curb infection in children during COVID-19 and safeguard the interests of parents at the same time. For schools to function with their full strength and enthusiasm, children also need to be vaccinated with the full course.[4]

India started its vaccination drive for children on January 3, 2022, for 15–18 years followed by inoculation of children between 12 and 14 years of age from March 16, 2022. India is planning to expand its next phase of the vaccination drive to children less than 12 years in the coming days, only at Government-run vaccination centers under tight scrutiny, across the country.[5,6]

To implement the vaccination drive for children, there is a need to create awareness among parents regarding the benefits of vaccination. We also need to precisely identify the reasons for vaccine hesitancy and also need to overcome the doubts concerning the vaccine.[7] Exploring the acceptability of vaccines in the target age group (10–12 years) and among parents, there is a need to know about their perception, and attitude toward COVID-19 infection and vaccination, and the practice adopted by them for prevention of infection.

Moreover, few surveys have been conducted to evaluate the parent's willingness for COVID-19 vaccination in children and limited information is present in this context.[2,7-9]

To the best of our knowledge, no such research study has been completed on children 10–12 years of age in the Indian population. The purpose of this questionnaire-based survey is to assess the practice, attitude, and perception of parents regarding COVID-19 vaccination in children 10–12 years of age, in a sample of pediatric patients reporting to OPD of Faculty of Dentistry, Jamia Millia Islamia, New Delhi, India.

Objectives of the Study

Primary objective

To estimate the level of perception, attitude, and practice among parents visiting the Faculty of Dentistry, JMI, toward the COVID-19 vaccination drive in children 10–12 years of age.

Secondary objective

To determine the factors responsible for vaccine hesitancy among parents of children 10–12 years of age.

Materials and Methodology

Study design

The study design is a cross-sectional questionnaire-based survey with a sample size of 320 over the time frame of three months (March 2023–May 2023). The process of subject selection consisted of targeting the subject population was 10–12-year-old children of Delhi, India. The sampling frame (accessible subjects) was 10–12-year-old children over the time frame of three months residing in Delhi. The actual subject sample was 10–12 years age children visiting the Faculty of Dentistry, Jamia Millia Islamia, New Delhi, India. Bias was removed by using the self-structured questionnaire which was validated before the commencement of the study by two independent investigators. Bias was also removed by using anonymous participants visiting the OPD [Figure 1].

Sample size calculation

The sample size before the initiation of the study was estimated based on prevailing prevalence, with 95% confidence level and 5% error and with a precision of 5%. The calculated sample size is 320 (with round-off).

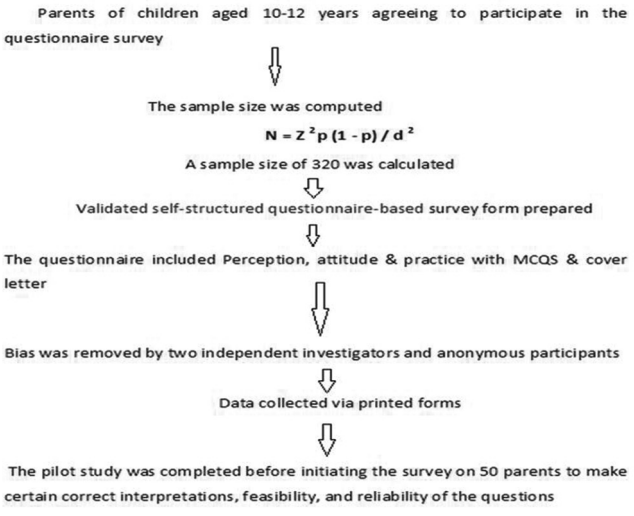

Figure 1: Data Collection and Recruitment flowchart

Sample size (N) can be calculated from the formula[10]:

$$N = Z^2 p (1 - p)/d^2$$

Z = Confidence level (95%)

P = 20% (expected proportion from previous pilot studies)

d = 5% of true value (0.05)

Survey questionnaire

Parents of all the children 10–12 years of age attending the OPD of the Pediatric and Preventive Dentistry Clinics during the period (March 2023–May 2023) were included after their due consent in writing and after completing their routine dental checkups and treatment. This was followed by the distribution of a questionnaire (both in English and Hindi language) among the parents of eligible children (10–12 years), after taking informed consent. This was a validated self-structured questionnaire. Face and content validation were done by getting the questionnaire filled by distribution among known 18 contacts and by repeating the procedure twice. Feedback received from participants was used to draft a modified version of the questionnaire submitted for approval. The purpose of the study and how to fill out the questionnaire were duly explained to them before taking their responses. The questionnaire included three sections, perception, attitude, and practice with a few multiple-choice questions in each heading. The cover letter explaining the objective of the study was attached with the questionnaire. The parents were informed that the survey was voluntary and also assured about the confidentiality of the data collected. No rewards were given to the respondents of our questionnaire and two—three repeated requests were given to parents who were not convinced to participate in the survey to perk up the response rate.

The information collected in the questionnaire included the following:

1. Demographic information of the parents participating in the survey—It included their name, age group, gender, marital status, number, and age of children, along with their educational level and nature of job.
2. Attitude for getting their children vaccinated for COVID-19—It included reasons for positive and negative attitudes.
3. Perception of parents regarding COVID-19 infection and vaccination
4. Practice regarding preventive measures against COVID-19 (meant for parents and children)

The approval of the study was taken by the Institutional Ethics Committee of our University.

Inclusion criteria

- Parents of children 10–12 years of age visiting dental OPD of Faculty of Dentistry, JMI, those willing to participate in the questionnaire-based survey.

Exclusion criteria

- Parents not willing to participate in the questionnaire-based survey.

The completed questionnaires were transferred to a database and statistical analysis was carried out.

Data collection and statistical analysis

Data was entered in a spreadsheet and descriptive analysis was done using percentages and frequencies in the form of charts, graphs, and tables. Further data analysis for the level of significance was done using SPSS® version 22 Chicago, USA, by appropriate statistical methods. The Chi-square test was used to find the association between analyzing the variables in the practice section. A *P* value of less than 0.05 was taken as statistically significant.

Results

Demographic characteristics of parents of children under consideration of COVID-19 vaccination

The median age of the study participants was 35.5 years. The majority of them were between 31 and 40 years of age. The proportion of female parents was more than 170 (53%) compared to males 150 (47%). Of all the parents, 310 (97%) were married, 7 (2%) were divorcee and 03 (1%) were single parent. The impact of the marital status of parents was not significant as far as decision making for COVID-19 vaccination was concerned. The educational status of the majority of the parents was less than graduate 153 (48%). Only 48 (15%) of the parents were having Government jobs. The majority 85% were surviving on either private jobs or their own business. Education and profession had significant effect on decision. The median age of children visiting the Department of Paediatric and Preventive Dentistry was 6.5 years of age. All the parents had heard about COVID-19 illness and 62% had suffered from COVID-19 in the past with a confirmed diagnosis. The rest of them 38% had experienced respiratory illness without undergoing any diagnosis or treatment [Table 1].

Perception of parents toward getting their children vaccinated against COVID-19

When asked about the perception of parents regarding COVID-19, the majority feel that COVID-19 disease is serious 243 (76%) and children are at risk of getting the disease 259 (81%). Almost 256 (80%) of parents feel the need for their children to get vaccinated against COVID-19. The majority of the parents perceive that COVID-19 vaccines are safe 189 (59%) and efficacious 240 (75%) for their children. Parents feel that the benefits of getting their children vaccinated against COVID-19 outweigh the risks of vaccine 214 (67%). Around 211 (66%) parents perceive the positive role of social media in the promotion of COVID-19 vaccines for children. Parents' perception regarding prevention from contracting COVID-19 was that once vaccinated 224 (70%), there was no need to

wear face masks, or use sanitizers/soaps, or to maintain social distancing. Parents 214 (67%) feel the need of getting child vaccinated for sending them to school followed by availing of daycare facilities after school 54 (17%) among working parents.

The Chi-square statistic is 137.1547. The *P* value is < 0.00001. The result is significant at $P < 0.05$. A significant association ($P < 0.05$) was seen between the variables of practice being followed by parents and their children as per COVID-19 norms [Table 2].

Main seasons for adopting a negative attitude toward COVID-19 vaccination included no/unclear safety information of the vaccine (36%), child being afraid of vaccine-induced pain (1%), fear of adverse effects of vaccine (3%), and false belief of having long term immunity due to natural infection (32%) already contracted by a child in past [Figure 2].

Main determinants of the positive attitude of parents include trust in vaccine regarding safety in children (42%), availability of positive information/news (5%) about vaccine, belief that vaccine can protect their child from severe COVID-19 (15%), acceptability for mild tolerable adverse effects of vaccine (1%), overall positive attitude for all questions subjected (18%) [Figure 3].

Discussion

In India, the COVID-19 vaccination drive for children below 12 years started wef 3rd January 2022. Corbevax and Covaxin got approval from regulatory body, Drug Controller General of India (DCGI) CDSCO, for restricted emergency use in children below 12 years of age. Fast track COVID-19 vaccine development and approval warrants its post-marketing continuous monitoring for efficacy and possible adverse effects in children and adolescents.[11]

Till the completion of our study (May 2022–July 2022), the approved vaccines were not yet the part of National immunization drive. New vaccine acceptance depends upon the perception, attitude, and practice adopted by parents of children eligible for COVID-19 vaccination.

Sociodemographic characteristics in our study resembled with studies conducted by Bagateli *et al.* and Cupertino *et al.* Around 52% of parents were graduated in our study in contrast to 72% who graduated and above in the study by Qerem *et al.*[12-14] Education level is directly linked to the degree of acceptance for the COVID-19 vaccine.

Almost 85% of the parents in our study were having either a private job or their own business. In our study, a high willingness (80%) for COVID-19 vaccination among both parents was found [Table 1] in contrast to study results reported by Bell *et al.*[15] in UK (55.8%). The high willingness for the COVID-19 vaccine for children is because all types of the working class of parents do not want to pose a risk of transmitting the virus to their children from their primary contacts, due to their regular outings for work commitments. Fifty percent in a study conducted by Bagateli *et al.*[12] 60.4% of parents were inclined to get their children vaccinated as reported in a study conducted by Montalti *et al.*[16] Teasdale *et al.* in their study revealed 49.4% of parents with positive planning to get their children vaccinated in contrast to less than half (28%) of the US parents as appeared in the National survey by Szilagyi *et al.*[17,18] In a survey conducted by Cho *et al.*[19] in August 2021, approximately 56.4% (575/1,019) were willing to vaccinate their children against COVID-19 in Korea.

In our study, 76% of parents felt that COVID-19 was associated with severe disease and 81% perceived that their children are at a greater risk of contracting COVID-19 infection [Figure 2]. In contrast to our findings, Harmain *et al.*[20] found that 84.7% of parents did not consider COVID-19 to be a very serious issue, and 53.9% considered that their children were not at high risk of COVID-19. Significant inclination ($P < 0.001$) toward their children's vaccination was seen among those parents possessing

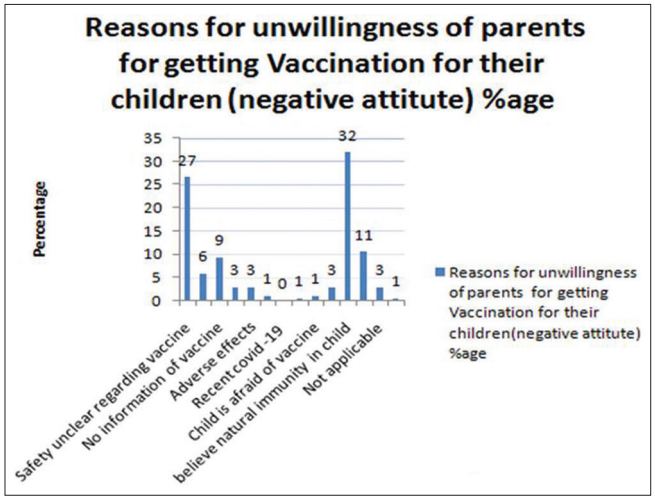

Figure 2: Negative attitude of parents toward getting their children vaccinated

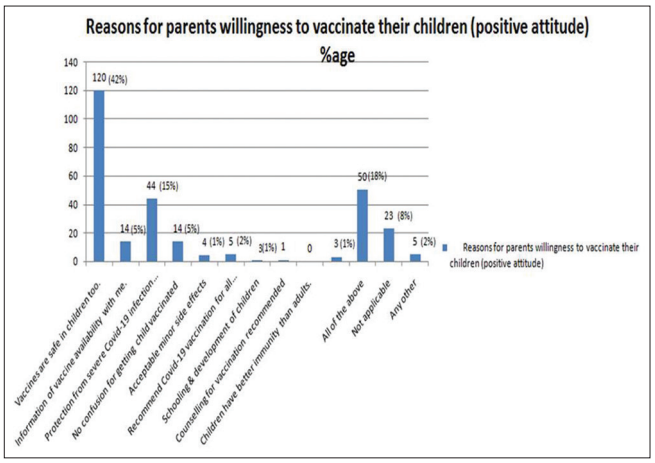

Figure 3: Positive attitude of parents to get their children vaccinated

Table 1: Demography of parents of children under consideration of getting COVID-19 vaccination in India

Parameters	Demographic characteristics of participants	Number & percentage *n*=320 (%age frequency)	*P*
Age	21–30 years	57 (18%)	<0.001*
	31–40 years	196 (61%)	
	>40 years	67 (21%)	
Gender	Male	150 (47%)	<0.01*
	Female	170 (53%)	
Marital status	Married	310 (97%)	0.60
	Divorcee	07 (2%)	
	Single parent (other than divorcee)	03 (1%)	
Education of parents	Undergraduate	153 (48%)	<0.01*
	Graduate	105 (33%)	
	Postgraduate	62 (19%)	
Nature of Job	Private	150 (47%)	<0.001*
	Govt job	48 (15%)	
	Own business	122 (38%)	
Age group of children who visited OPD	1–5 years	32 (10%)	
	6–10 years	147 (46%)	0.50
	More than 10 years	141 (44%)	
Willingness to get children vaccinated	Yes	256 (80%)	<0.001*
	No	64 (20%)	
Vaccine hesitancy	Yes	150 (47%)	<0.01*
	No		

* statistically significant $P<0.05$

Table 2: General questions subjected and responses received regarding practice adopted by parents for the prevention of COVID-19 disease

Practice adopted by parents	Every time	Quite often	Some times	Never	Row totals
Frequency of hand sanitization after visiting crowded public places.	173 (171.65) [0.01]	51 (61.77) [3.24]	51 (65.57) [3.24]	45 (21.01) [27.38]	320
The habit of wearing a face mask at crowded public places.	227 (171.65) [17.85]	42 (61.77) [6.33]	45 (65.57) [6.45]	6 (21.01) [10.73]	320
The habit of maintaining physical/social distancing from other people around them.	163 (171.65) [0.44]	61 (61.77) [0.01]	93 (65.57) [11.48]	03 (21.01) [15.44]	320
Self-control for avoiding mass gatherings/ weddings/parties/markets etc.	115 (163.06)[14.17]	90 (58.68) [16.71]	70 (62.29) [0.95]	29 (19.96) [4.09]	304
Column total	678	244	259	83	1264 (Grand total)

higher education, greater knowledge of COVID-19 and its vaccines, with comorbidities, and whose children got infected with the virus during COVID-19 waves.

Variable range of acceptability has been seen from 90% in China to less than 55% in Russia.[21] The main cause for variable acceptability of vaccine may be due to differences in time periods for vaccine introduction, emergency authorization for use (EAU), availability of vaccine for age groups in different countries, and re-emerging waves of COVID-19 variants across the globe. In Korea, high immunization rate of up to 95.9–100% among children has been recorded due to the availability of compensation against vaccine injury in National programs.[22]

In our study, important determinants associated with COVID-19 vaccine acceptability [Figure 3] include concerns about emerging variants of COVID-19, the availability of information about vaccines through social media platforms (66%), positive perception and attitude on vaccine safety (59%) and efficacy (immunogenicity)(75%) of vaccine, positive attitude for accepting minor adverse effects of vaccine over the major benefit of protection of child to achieve normal social life, schooling (67%) and availing daycare facility (17%), [Table 1] parent's own experience of receiving vaccine doses, concerns for physical and mental health of their children [Figure 3]. The utmost desire not only to prevent infection and social damage but also to restore normal daily life emerged as a positive attitude, leading to high willingness for COVID-19 vaccine.

Around 47% of parents were hesitant to get their children vaccinated, but still willing for the same due to the resumption of normal schooling and children's willingness to socialize among their peer groups [Table 1]. Hesitancy emerged due to the family's own bad experiences with COVID-19, the negative news of morbidity and mortality surrounding the pandemic, personal differences in priorities, financial implications being faced by families due to COVID-19.

In contrast, parents who perceived greater knowledge in the form of misinformation on COVID-19 vaccination reported a higher tendency of vaccine hesitancy. About 21.9% of parents were hesitant to get their children 5–11 years old vaccinated against COVID-19 in Italy.[23] The highest rates of hesitancy among parents of children toward a future COVID-19 vaccine were found in demographic groups in Chicago and Cook County, Illinois, in June 2020, that have been the most severely affected by the pandemic.[24] In countries of the Eastern Mediterranean Region, concerning parents' attitudes toward vaccine safety was about one-third of participants (32.5%) believed that vaccination was unsafe.[25]

Among the predictors of vaccine hesitancy in South Korea in January 2022, are status of job, educational level, family income, health, information available on various media and platforms, and mandatory Government policies including vaccine certificates.[26]

To conclude, factors such as age, gender, educational and job status, income, occupation, marital status, co-morbid status, race/ethnicity, perceived severity of COVID-19, perceived risk and benefit of COVID-19 vaccine, trust in the healthcare system, Government mandatory vaccine certificates and health insurance policies, strict fines for compliance for following preventive instructions in place, myths and rumors among different religions/socioeconomic statuses, perceived vaccine barriers, political leaning have shaped the decision-making process of parents and children for getting COVID-19 vaccination.[27]

Limitations of the study

This study had some limitations. The survey was conducted between (May 2022–July 2022), and the perceived vaccine safety and infection threat (emergence of variants of COVID-19) may have changed over time in different parts across the globe. It is possible that developments like the appearance of the delta-variant and new vaccination safety data would not be reflected by the cross-sectional design. Secondly, an offline mode was used to conduct the survey only on parents visiting the OPD of the Pediatric and Preventive Dentistry Department. Therefore, it is likely that we may not be able to reach vulnerable groups. Finally, the sample size (n = 320) is small, and therefore, results cannot be generalized.

Conclusion and Recommendations

COVID-19 vaccination these days is undemanding, yet controversial. Understanding the opinions and viewpoints of the stakeholders and target population responsible for vaccine implementation during the times of outbreaks of COVID-19 variants is crucial. Shared decisions for COVID-19 vaccination in children taking parents, children, and their family physicians in confidence should be respected. Availability of updated and factual information on the COVID-19 vaccine, especially expected risks and benefits, is paramount, shaping the decision making by parents for vaccination. Conducting mass awareness campaigns and programs for COVID-19 vaccination in children and adolescents, through educational institutions, TV channels, radio, and social media platforms will add on to develop a positive attitude toward prevention strategies planned by Governments. Understanding parental reluctance to receive the COVID-19 vaccine aids policymakers in breaking down stereotypes and promoting widespread COVID-19 vaccination.

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Conflicts of interest

There are no conflicts of interest.

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