ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

Hesitancy versus acceptability: An observational study for acceptance of COVID-19 vaccine among parents and guardians of children under 17 years age in South East Rajasthan

Ashutosh Sharma[1], Vinita Gupta[2], Anita Sharma[3], Saurabh Sharma[4]

[1]Associate Professor, Department of Community Medicine, [2]Assistant Professor, Department of Obstetrics and Gynaecology, [3,4]Assistant Professor, Department of Microbiology, Government Medical College, Kota, Rajasthan, India

Submission: 01-05-2022 Revision: 11-06-2022 Publication: 01-08-2022

ABSTRACT

Background: Vaccination against COVID-19 is necessary to reach herd immunity and essential for mitigating the spread. To establish herd immunity, the immunity generated by natural infection or vaccination must prevent onward transmission, not just clinical disease. However, several studies have shown that achieving herd immunity through natural infection might be difficult. **Aims and Objectives:** The aim of the study is to enquire about parental acceptability for COVID-19 vaccination for their children, factors affecting acceptability, perceptions for pediatric COVID-19 vaccines. **Materials and Methods:** We conducted an online questionnaire survey in mode of Google form which was distributed through social media platforms to parents/guardians of children below 17 years of age in months of November and December 2021. The questionnaire had various sections: Socio demographic characteristics, family members and medical history, COVID-19-related history, attitudes toward COVID-19, attitudes toward COVID-19 vaccines, and acceptance of COVID-19 vaccination for their children. **Results:** The most of the parents (71.77%) were ready to vaccinate their child. Graduated parents were showing maximum acceptance. Variables related to maximum vaccine acceptance include English medium of education, higher income, COVID-19-positive member in family, vaccinated parents/guardians, and vigilant parents/guardians about child COVID vaccination. In case of side effects, 68.05% of responders agreed to follow the professional advice of personal doctor/vaccinator. About 35% of respondents want government to roll out vaccination in a phased manner. About 69% responders are in favor of making hospitals and schools as COVID-19 vaccination center for children. **Conclusion:** The study found high multifactorial acceptability for pediatric COVID-19 vaccination which should be rolled out in phased manner.

Keywords: Acceptance; Adolescent; Child; COVID-19 vaccines; Hesitancy; Parents; Vaccination refusal

Access this article online

Website: http://nepjol.info/index.php/AJMS

DOI: 10.3126/ajms.v13i8.44777

E-ISSN: 2091-0576

P-ISSN: 2467-9100

INTRODUCTION

Since the start of the COVID-19 pandemic to September 29 2020, COVID-19 pandemic is going on with new variants coming. As of December 8, 2021, there have been 265,713,467confirmed cases of COVID-19, accounting 5,260,888 deaths globally.[1] To reduce the hostility and spread of the COVID-19 pandemic, several public health measures have been found effective, including universal mask wearing, maintaining physical distances, and reducing social contact. The long-term success of the public health response to COVID-19 would depend on herd immunity.[2]

Address for Correspondence:
Dr. Saurabh Sharma, Assistant Professor, Department of Microbiology, Government Medical College, Kota, Rajasthan, India.
Mobile: 8696339220. **E-mail:** drsaurabhsharma09@gmail.com

To establish herd immunity, the immunity generated by natural infection or vaccination must prevent onward transmission, not just clinical disease. However, several studies have shown that achieving herd immunity through natural infection might be difficult.[3] Vaccination is a very important tool for achieving the herd immunity threshold for COVID-19.

As a consequence of reliance on scientific and epidemiological evidence and pro-active implementation, India's COVID-19 vaccination program has achieved historical milestone of administering more than 141 crores doses so far. About 90% of the adult population of the country has been covered with at least one dose and 62% of the adult population has been covered with both the doses. Keeping in view the recent global surge of COVID-19 cases, detection of Omicron variant which has been categorized as a Variant of Concern, scientific evidence, global practices, and the inputs/suggestions of "COVID-19 Working Group of National Technical Advisory Group on Immunization (NTAGI)" as well as of "Standing Technical Scientific Committee" of NTAGI, Government of India has decided to further increase the coverage of COVID-19 vaccination asCOVID-19 Vaccination of children in the age-group of 15–18 years from January 3, 2022. For such beneficiaries, vaccination option would be "Covaxin" only.[4]

For a vaccine to be effective in controlling the spread of COVID-19, it is estimated that 67% of the population will need to receive the vaccine to reach herdimmunity.[2] In 2020, about 26.16% of the Indian population fell into the 0–14 year, thus in countries like India, it is very difficult to achieve herd immunity/community protection against COVID-19 without including and implementing a robust vaccination effort for children.[5]

Unfortunately, vaccine hesitancy, disbelief, and refusal have been a longstanding public health problem for routine immunizations in developing countries like India. However, the acceptability level of the COVID-19 vaccine for children is less well known, and there could be major differences in the rates of acceptance vaccine against COVID-19 among parents/guardians. Lower vaccine confidence and hesitancy among parents have been observed and uptake has been observed in socio demographic groups in certain studies.[6] Thus, it is important to understand the differences in acceptability/hesitancy in parents for children's COVID-19 vaccination across varying communities and socio demographic groups so as to identify the populations for whom the vaccine information may be insufficient to promote uptake. The success of any COVID-19 vaccination program will depend on public willingness to receive the vaccination. With this knowledge, hesitant groups will be recognized so that vaccine communication and distribution strategies could be focused to hesitant groups which will help in ensuring equitable vaccine allocation among children.

Aims and objectives

The aims of this study are to enquire about parental acceptability toward COVID-19 vaccination for their children and to determine factors affecting their acceptability. The main outcome of the study will be parents' willingness to vaccinate their children with COVID-19 vaccine and which in return will help the policy makers in formulating the policies to reduce factors affecting vaccine acceptance and immunization programs.

MATERIALS AND METHODS

Study design and study setting

An internet-based cross-sectional survey was conducted from November 2021 to December 2021. We conducted an online questionnaire survey in the Google forms mode to know about the perceptions of parents/guardians with children <17 years of age toward COVID-19 vaccination for their children.

Study population and study tool

Residents of Rajasthan who are 18-years-old and above and of either gender having children <17 years of age were selected and included in the study. The online self-administered questionnaire was designed so as to explore and assess each and every aspect of parents'/guardians' views and perceptions toward childhood vaccinations. The contents of the questionnaire included (1) socio demographic characteristics such as age, gender, place of residence, and educational level of both parents and family income; (2) previous COVID-19 related family history and vaccination status; (3) questions regarding COVID-19 vaccine acceptance or reluctance, reasons behind it, attitudes toward COVID-19 vaccines, and vaccination preferences for the future COVID-19 vaccination.

Ethics statement

The study protocol was reviewed and approved by the Institutional Ethical Committee of Government Medical College Kota. (No.Acad/Ethical clearance/2022/05 dated January 4, 2022).

Inclusion criteria

As the questionnaire was circulated electronically, the implied consent was obtained from all the participants who took this online survey.

Exclusion criteria

Those who not filled/incompletely filled Google form were excluded from the study.

Process of data collection

Google form-based questionnaire was sent through various social media platforms. The online link for questionnaire was made available for about 2 months. Our study was completely a voluntary online survey. For better understanding, the questionnaire was provided both in English and Hindi language.

Data analysis

The data collected in the online Google form were examined for any errors and then exported into Microsoft Excel 2016 for further analysis. Descriptive statistics were used to summarize the respondent's socio demographic. Chi-square test was used to analyze the significance of the association between various qualitative variables. $P<0.05$ was taken as significant in the study.

RESULTS

Total of 486 parents and guardians attended the survey. Nineteen were excluded because of failure in fulfilling the inclusion criteria and incomplete data. Hence, 457 parents and guardians were eligible and included in the final analysis. Baseline characteristics of these participants with their tendency toward vaccinating their ward with COVID-19 vaccine are presented in Table 1. Themost (85.78%) of the participants were urban inhabitants and want to vaccinate their ward with COVID-19 vaccine if available (61.71). About 96.93% of participants were parents (either mother or father) and among them, 71.77% were ready to vaccinate their child. In relation to educational status of participants, parents having education above secondary were showing maximum acceptance (82.49% and 85.12% of mother and father, respectively.). Other variables related to maximum vaccine acceptance include English medium of school education (63.02%), higher annual income (51.43%),history of COVID-19 positive member in family (72.65%), completely vaccinated parents/guardians (66.08%), vigilant parents/guardians about government child COVID vaccination schemes (60.18%), who rely more on governmental agencies/healthcare workers information about COVID-19 (51.64%), and who does not experienced any post-COVID-19 vaccination side effects (67.18%). The most of responders (80.30%) think that pediatric vaccination program is not taken in a hurry by government and maximum among them (64.77%) are willing to vaccinate their ward if vaccine is available. About 63.68% responders are ready to vaccinate their child even if he/she was positive in the first/second wave of COVID-19. In case of any side effects, 68.05% of responders agreed to follow the professional advice including personal doctor and vaccinator.

Table 2 shows the acceptance, attitudes, and preferences of participants toward the future COVID-19 vaccine. Of the 457 respondents, 95.84% thought that vaccination would be an effective way to prevent and control COVID-19. About 35% of respondents want government to roll out vaccination in a phased manner. About 69% responders are in favor of making all hospitals including the child care hospitals and schools should be used as COVID-19 vaccination center for children.

DISCUSSION

In this study, we identified differences in acceptability toward COVID-19 vaccine among parents by socio demographic characteristics and also emphasized on awareness and attitudes toward COVID-19 including sources of COVID-19 information. The World Health Organization has noted that vaccine hesitancy is a leading threat to global health in regard to known vaccine preventable illnesses.[7] Vaccine hesitancy is a complex issue especially in context of pediatric COVID-19 vaccines as it is comparatively new concept for general population. Hence, it is important to explore and address specific concerns for optimal counseling and vaccine uptake.

About 95% of respondents recognize the fact that vaccination would be the best possible and effective way to prevent and control COVID-19.

We observed that overall 73.52% of respondents accept the vaccine and wanted to get their ward vaccinated when it became available, while 25.16% was hesitant, they either wanted to consult their family doctor or wanted to wait before the vaccine's safety was confirmed. Only 1.32% completely refused to accept vaccine. There are a few studies regarding COVID-vaccine hesitancy or acceptance among parents.[8-11] Attitudes toward a COVID-19 vaccine acceptance appear more positive in our study (73%) as compared to study done in US (40–60%),[12] 36.3% in turkey,[11] and 51% intended to have their children vaccinated in Germany;[13] however, results were nearby to that of results reported by a Chinese study (72.6%)[10] and 75.8% reported by Australian investigators.[14] The wide heterogeneity in the rate of vaccine acceptance reported by the various studies depends on several factors including several demographic, socioeconomic, cultural, and geographic factors. This could also be due to difference in vaccination coverage, type of questionnaire used in surveys, and sample size used in survey. Our survey indicates more positive attitude toward COVID-19 vaccination in our study appear that reflect the high level of parent trust in vaccines.

Compared to rural areas, urban residents had a higher acceptance rate for COVID-19 vaccines. This may be

Table 1: Comparison of socio demographic characteristics of respondents with their tendency toward vaccinating their ward with COVID-19 vaccine

Demographic characteristics (N=457)	Will you vaccinate your child with COVID-19 vaccine if available					
	Yes n(%)	No n(%)	Wait for safety data n (%)	Consult family doctor n (%)	n (%)	P value
Residence						
Rural	54 (11.81)	4 (0.88)	7 (1.53)	0 (0)	65 (14.22)	0.00001
Urban	282 (61.71)	2 (0.44)	28 (6.13)	80 (17.50)	392 (85.78)	
Relationship with child						
Parents	328 (71.77)	6 (1.31)	33 (7.22)	76 (16.63)	443 (96.93)	0.2116
Guardian	8 (1.75)	0 (0)	2 (0.44)	4 (0.88)	14 (3.07)	
Education status of mother						
Above secondary	277 (60.61)	2 (0.44)	30 (6.56)	68 (14.88)	377 (82.49)	
Uptosecondary	40 (8.75)	2 (0.44)	5 (1.09)	12 (2.63)	59 (12.90)	
Illiterate	19 (4.16)	2 (0.44)	0 (0)	0 (0)	21 (4.60)	
Education status of father						
Above secondary	290 (63.45)	4 (0.87)	25 (5.47)	70 (15.31)	389 (85.13)	
Up to secondary	46 (10.07)	2 (0.44)	10 (2.19)	10 (2.19)	68 (14.87)	
Illiterate	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Medium of school education of child						
English	288 (63.02)	0 (0)	7 (1.53)	12 (2.63)	307 (67.18)	0.00001
Hindi	48 (10.5)	6 (1.31)	28 (6.13)	68 (14.88)	150 (32.82)	
Annual income						
Up to 10lacs	180 (39.38)	0 (0)	25 (5.47)	17 (3.72)	222 (48.57)	
>10 lacs	156 (34.13)	6 (1.31)	10 (2.18)	63 (13.78)	235 (51.43)	
Have you or any member in your family ever had COVID-19 infection						
Yes	332 (72.65)	0 (0)	7 (1.53)	28 (6.13)	367 (80.31)	0.00001
No	4 (0.88)	6 (1.31)	28 (6.13)	52 (11.38)	90 (19.69)	
Vaccination status of parents/guardians with COVID-19 vaccine						
With both doses	302 (66.08)	0 (0%)	1 (0.22)	2 (0.44)	305 (66.74)	0.00001
With single dose	34 (7.44)	0 (0)	29 (6.35)	78 (17.07)	141 (30.85)	
Not vaccinated	0 (0)	6 (1.31)	5 (1.09)	0 (0)	11 (2.41)	
Most trustworthy source of information on COVID vaccine for children for you						
Family Members/Friend	10 (2.19)	0 (0)	0 (0)	5 (1.09)	15 (3.28)	0.00001
Government (State/Union)	200 (43.76)	5 (1.09)	15 (3.28)	35 (7.66)	255 (55.80)	
Health Workers	36 (7.88)	1 (0.22)	0 (0)	15 (3.28)	52 (11.38)	
Media/Social media	90 (19.69)	0 (0)	20 (4.38)	25 (5.47)	135 (29.54)	
Do you know that vaccine against COVID-19 has been approved for children of 12–17 years of age						
Yes	275 (60.18)	5 (1.09)	25 (5.47)	50 (10.94)	355 (77.69)	0.0019
No	61 (13.35)	1 (0.22)	10 (2.19)	30 (6.56)	102 (22.31)	
Do you think that decision of approval of vaccine for children was taken in Hurry in our country						
Yes	40 (8.75)	5 (1.09)	0 (0)	45 (9.85)	90 (19.70)	0.00001
No	296 (64.77)	1 (.22)	35 (7.66)	35 (7.66)	367 (80.30)	
What will you do for post vaccination effect						
Will consult personal doctor	145 (31.73)	0 (0)	20 (4.38)	60 (13.13)	225 (49.24)	
Follow advice of vaccinator	166 (36.32)	5 (1.09)	5 (1.09)	20 (4.38)	196 (42.89)	
Will wait to subside automatically	25 (5.47)	1 (0.22)	10 (2.19)	0 (0)	36 (7.87)	

because urban dwellers are more affected by the pandemic as compared to rural dwellers. Another reason might be that rural people are comparatively more culturally conservative for vaccination.

Parents education level plays a significant role in acceptance toward vaccination. In this study, parents acceptance toward COVID vaccine is more with higher level of education as compared to those with a lower level of education (secondary education or less). This indicates that health authorities should increase awareness regarding COVID-19 vaccination targeting the people with lower education, leading to an overall improvement in acceptance and compliance of the general public. Including in above aspect, more acceptance was seen among mother with higher educational level. This shows the direct positive impact of female education on family health.

More acceptance was seen among parents whose ward's medium of school education was English. This could

Table 2: Awareness toward acceptance for COVID-19 vaccines in participants

Characteristics (N=457)	n (%)
What should government do to increase trust/ acceptance for COVID vaccination of children below 17	
Do more trials	124 (27.13)
Focus on raising more awareness in media	79 (17.28)
Involve more scientist/doctors	63 (13.78)
Roll out vaccination in a phased manner	162 (35.44)
Involve School Teachers	29 (6.37)
Where should government make COVID-19 vaccination center for children	
Only hospitals	35 (7.67)
Only child hospitals	15 (3.28)
Only schools	90 (19.69)
All of the above	317 (69.36)

be possibly explained as the most of the students of an English medium school are urban dweller, belong to a higher income family group with higher educational level of parents which indirectly affect their acceptance toward vaccine.

Maximum positive respondents obtained COVID-19 vaccines-related information through governmental agencies including healthcare workers (51.64%) while 19.70% received through media/social media. About 35.44% respondents want government to roll out child vaccination program in a phased manner, so as to increase acceptance of child COVID vaccination among parents. This shows people's trust and confidence in public health authorities. Thus, government should strengthen its educational and awareness program to outreach more and more people. Such supporting information can increase parents' confidence in COVID-19 vaccines and reduce their anxiety. Our study has shown a very positive response as compared to that in a study done in Korea where only 42% respondents show confidence in health authorities in mid-May of 2021.[15] While social media are a powerful tool for disseminating information, there are concerns about false data, unverified rumors, and even malicious misinformation appearing on these platforms. Greater exposure to negative information about COVID-19 vaccination was associated with lower parental vaccine acceptance. If misinformation has spread globally through social media during the COVID-19 pandemic, and this may pose challenges for COVID-19 vaccination programs.

Acceptability toward the future pediatric vaccine was maximum seen among higher income group while it was least among lower income group. This finding is aligned with other recent studies of vaccine hesitancy.[6] This may be hypothesized due to low level of awareness and misconceptions which lead toward vaccine hesitancy among this group. We were unable to explore further reasons for differences in COVID-19 vaccine acceptance due to insufficient representation of lower income groups in agreeing to participate in interviews.

However, as per present study, concerted effort must be done to develop effective approaches toward promoting vaccine uptake among lower income groups.

Vaccine acceptance was more among those families where any one of the members became COVID-positive during any of the previous two waves (72.65%). This might be explained due to the social and economic sufferings experienced by families during the pandemic associated with feelings of fears, anxiety, and insecurities.

The most of the vaccine acceptancy toward pediatric vaccination came from parents who got completely vaccinated by both the doses (66.08%). This might be explained by fact that parents are mainly concerned about side effects and extent of risk involved in COVID vaccination. However, as they have themselves experienced minimal side effects, this make them assured toward the safety of vaccine for children.

Maximum participants have faith in governmental vaccination policies and agree that decision of approval for children vaccination was not taken in a hurry. The most of the respondents are in favor of following the advice of vaccinator if any post-vaccination effects are experienced. As per our study, parents favor in an broad multidisciplinary approach in starting the pediatric COVID vaccination including all hospitals and even schools to be as child vaccination centers.

Limitations of the study

Participation was voluntary in our study. Not all the eligible candidates gave their consent to participate in the study; data were collected online, which means we may not have reached vulnerable groups, including those with poor socioeconomic level and those who were not internet friendly including the illiterate.

CONCLUSION

To achieve herd immunity and mitigate the effect of pandemic, pediatric COVID-19 vaccination program is a must as children comprise a substantial part of susceptible Indian population. Thus, it is essential to include children and their parents in vaccination efforts and know various factors affecting their acceptance. In our study, the pediatric vaccine acceptance was high and the highest rates of acceptance were found among urban participants, parents who were completely vaccinated, families having higher

educational status and income level, and those having COVID positive family member in the previous waves. The most of the participants rely on governmental agencies for COVID-related information and want government to implement pediatric vaccination in a roll out manner, including all types of hospitals and schools as vaccination centers.

REFERENCES

1. World Health Organization. WHO Coronavirus (COVID-19) Dashboard. Geneva: World Health Organization; 2021. Available from: https://www.covid19.who.int [Last accessed on 2021 Dec 08].
2. Randolph HE and Barreiro LB. Herd immunity: Understanding COVID-19. Immunity. 2020;52(5):737-741.
   https://doi.org/10.1016/j.immuni.2020.04.012
3. Chen X, Chen Z, Azman AS, Deng X, Sun R, Zhao Z, et al. Serological evidence of human infection with SARS-CoV-2: A systematic review and meta-analysis. Lancet Glob Health. 2021;9(5):e598-e609.
   https://doi.org/10.1016/s2214-109x(21)00026-7
4. Available from: https://www.mohfw.gov.in/pdf/Guidelines for COVID19 Vaccination of Children between 15 to18 years and Precaution Dose to HCWsFLWs&60 population with comorbidities.pdf [Last accessed on 2022 Jan 31]
5. Available from: https://www.statista.com/statistics/271315/age-distribution-in-india [Last accessed on 2022 Jan 31]
6. Alfieri NL, Kusma JD, Heard-Garris N, Davis MM, Golbeck E, Barrera L, et al. Parental COVID-19 vaccine hesitancy for children: Vulnerability in an urban hotspot. BMC Public Health. 2021;21(1):1662.
   https://doi.org/10.1186/s12889-021-11725-5
7. World Health Organization. Ten Threats to Global Health in 2019. Geneva: World Health Organization; 2019. Available from: https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019 [Last accessed on 2021 Jul 06].
   https://doi.org/10.14293/s2199-1006.1.sor-uncat.cl25im3.v1
8. Bell S, Clarke R, Mounier-Jack S, Walker JL and Paterson P. Parents' and guardians' views on the acceptability of a future COVID-19 vaccine: A multi-methods study in England. Vaccine. 2020;38(49):7789-7798.
   https://doi.org/10.1016/j.vaccine.2020.10.027
9. Goldman RD, Marneni SR, Seiler M, Brown JC, Klein EJ, Cotanda CP, et al. Caregivers' willingness to accept expedited vaccine research during the COVID-19 pandemic: A cross-sectional survey. ClinTher. 2020;42(11):2124-2133.
   https://doi.org/10.1016/j.clinthera.2020.09.012
10. Zhang KC, Fang Y, Cao H, Chen H, Hu T, Chen YQ, et al. Parental acceptability of COVID-19 vaccination for children under the age of 18 years: Cross-sectional online survey. JMIR Pediatr Parent. 2020;3(2):e24827.
    https://doi.org/10.2196/24827
11. Brandstetter S, Böhmer MM, Pawellek M, Seelbach-Göbel B, Melter M, Kabesch M, et al. Parents' intention to get vaccinated and to have their child vaccinated against COVID-19: Cross-sectional analyses using data from the KUNO-Kids health study. Eur J Pediatr. 2021;180(11):3405-3410.
    https://doi.org/10.1007/s00431-021-04094-z
12. Centers for Disease Control and Prevention. What Clinicians Need to Know about Pfizer BioNTech COVID-19 Vaccination of Adolescents; 2021. Available from: https://www.emergency.cdc.gov/coca/calls/2021/callinfo_051421.asp [Last accessed on 2021 Jun 10].
13. Yılmaz M and Sahin MK. Parents' willingness and attitudes concerning the COVID-19 vaccine: A cross-sectional study. Int J ClinPract. 2021;75(9):e14364.
    https://doi.org/10.1111/ijcp.14364
14. Rhodes A, Hoq M, Measey MA and Danchin M. Intention to vaccinate against COVID-19 in Australia. Lancet Infect Dis.2020;21(5):E110.
    https://doi.org/10.1016/s1473-3099(20)30724-6
15. Choi SH, Jo YH, Jo KJ and Park SE. Pediatric and parents' attitudes towards COVID-19 vaccines and intention to vaccinate for children. J Korean Med Sci. 2021;36(31):e227.
    https://doi.org/10.3346/jkms.2021.36.e227

Authors Contributions:
AS- Concept and design of the study, statistical analysis and interpretation, preparation of manuscript, and revision of the manuscript; **VG-** Concept and design of the study; **AS-**Concept, coordination prepared first draft of manuscript; and **SS-** Prepared first draft of manuscript, preparation of manuscript, and revision of the manuscript.

Work attributed to:
Government Medical College, Kota - 324 005, Rajasthan, India.

Orcid ID:
Dr. Ashutosh Sharma - https://orcid.org/0000-0003-3131-1410
Dr. Vinita Gupta - https://orcid.org/0000-0002-4960-1371
Dr. Anita Sharma - https://orcid.org/0000-0001-7469-6125
Dr. Saurabh Sharma - https://orcid.org/0000-0001-6511-5368

Source of Funding: None, **Conflicts of Interest:** None.