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A cross sectional study of the parent's willingness to vaccinate children of age group between 5-12 years against covid-19

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Abstract: *Introduction:* The emerging respiratory illness caused by SARS-CoV-2 has posed the threat to human life across the globe. Various physical measures applied to curb the spread of the virus in initial phase of pandemic but high level of immunity by vaccination is an effective strategy to reduce the morbidity and mortality. To achieve this parent's willingness is important for vaccination of children. *Objectives:* To study the parent's willingness and associated factors to vaccinate the children with Covid-19 vaccine. *Material & Methods:* The cross sectional study conducted in the month of July 2022. A confidential interview of 300 parents visited to OPD was taken. Information obtained about socio-demography, routine immunization and comorbidity in children, parents COVID-19 vaccination, COVID-19 infection and hospitalization in family members and willingness for children's covid-19 vaccination. *Results:* Out of 300 parents around 253(84.3%) parentswere willing, 10(3.3%) not willing and 37(12.3%) not sure about children's vaccination. hospitalization of family members, parental vaccination against Covid-19, vaccination of siblings > 12 years, parents having 1-2 children were significantly associated with willingness. *Conclusion:* Counselling of parents to relieve the anxiety is needed, communicating clear information about vaccination and expected side effects of the vaccine, provision of reliable source of information like family physician, health care workers.

Keywords: COVID-19 vaccination, Parent's willingness, Unwillingness.

Introduction

The COVID-19 was emerging respiratory illness caused by SARS-CoV-2 has posed the threat to human life across the globe, including India. Various physical measures applied to curb the spread of the virus in initial phase of pandemic including lockdown, stay at home orders, mask-wearing and social distancing, hand hygiene. Closure of schools, collages, auditoriums, play grounds, offices, shift works at many places to avoid overcrowding of peoples. Major stress is given on the Covid appropriate behaviour by peoples.

The higher level of immunity in community by vaccination is an effective strategy to reduce the morbidity and mortality. Reduction in overall morbidity and mortality of many infectious diseases in the past was done by vaccination [1]. Vaccination can similarly play an important role in controlling the COVID-19 pandemic. [2]. According to statistical models, 60-72% of people need to be vaccinated to reach the threshold of herd immunity, in the case of vaccines that are 80% effective [3]. So children will also need to receive the covid-19 vaccine for effective heard immunity to be achieved. Considering the emergence of new variants having high transmissibility like Omicron variant, a higher vaccination uptake may be needed [4].

Government of India started the COVID vaccination program on 16 January 2021 to all Health Care Workers and expanded with time to include Front Line Workers, citizen >60 years of age, comorbid peoples, citizen >45 years of age and eventually citizen >18 years of age [5]. As the scientific knowledge

evolved the government of India introduced vaccination for the 15-18 age group in January 2022, and for the 12-14 age group in March 2022. Mainly 4 vaccines are used in India for drive- Covishield, Covaxin, Sputnik V, and Corbevax. In United States, the Centres for Disease Control and prevention (CDC) recommended that everyone aged 5 years and older should get vaccinated against covid-19. The CDC notes that children aged 5-12years are most frequently affected by multisystem inflammatory syndrome in children (MIS-C), a condition associated with covid-19 [6].

India has given emergency use permission to Covaxin made by Bharat Biotech in 6-12years age group, along with this Corbevax for 5-12 year age group [7]. But in India covid-19 vaccination in children's <12years age group is yet not started. As the schools are opened and children will expose outer environment. To protect them vaccination of this children is needed. Early studies on the COVID-19 pandemic showed that few numbers of children were infected by the virus [8].

Parents and guardians are the decision makers on their children's vaccination. Parents are facing tremendous stress in relation to the COVID-19 pandemic and fear about vaccine safety, risks of children becoming infected by the virus affected parent's acceptance of the new COVID-19 vaccination program. The factors like fear of side effects, especially among children and those with co-morbidities, resulting primarily from fake news and misinformation circulated through social media. Hence, the present study aimed to identify factors associated with parental willingness to vaccinate their children with Covid -19 vaccination.

Study Objectives:

i. To study the parent's willingness to vaccinate the children with Covid-19 vaccine.
ii. To identify sociodemographic and other factors associated with parent's willingness.

Material and Methods

A hospital based observational cross- sectional study was conducted in OPD of UHTC of medical college in the month of July 2022 after obtaining the Ethics Committee clearance. Considering the parent's willingness to vaccinate the children between age group of 5-12 years to be 44 % from study in Saudi Arabia [9]. The sample size to be covered was calculated to be 274, absolute precision 6%, rounded of 300 parents was taken.

*Inclusion criteria w*ere voluntary participation of parents of child between 5-12 years age group visited to OPD of UHTC.

Exclusion criteria were parents not willing to participate.

The confidential interviews of parents was carried out with the help of structured questionnaire by the trained staff of department of Community Medicine after taking their written informed consent. The purpose of study is explained to the participant. It consists of information about the sociodemographic characteristics, number of children, >12 years age children in family. Information about routine immunization of children, comorbid condition in children. Covid-19 vaccination details of children >12 years old were taken. Information related to parent's covid-19 vaccination status, covid-19 infection in family members, hospitalisation due to severe disease, sources of getting information about vaccination and willingness for children covid-19 vaccination were taken.

Definition of Vaccination willingness: Vaccination willingness was defined as the proportion of participants willing or likely to vaccinate their children against COVID-19 [11].

Ethical Considerations: Permission of Institute Ethical Committee (IEC) was taken. A written informed consent was obtained from all participants. Full confidentiality of respondent's information was kept and information was used only for research purpose.

Data Analysis: Microsoft excel was used for data entry. The data was tabulated and analysed using SPSS version 23. Chi-square test and Fischer Exact test has been used to test the significance of the parent's willingness for Covid-19 vaccination of

children in association with various sociodemographic factors. A p-value less than 0.05 considered as significant.

Results

In this study total 300 parents participated, majority of parents 188(62.7%) between 21-35 years of age with mean age of 34.09 ± 4.55 years.156 (52%) were male and 144(48%) were female. Among the participant 124(41.3%) belong to Hindu religion, 132(44%) were educated up to middle school, 243(81%) were skilled worker, 27(9%) were working in health care setting. 175(58.3%) parents belong to class IV socio-economic class and 281(93.6%) had monthly income less than thirty thousand. 219(73%) has 1-2 children, 4(1.3%) has children with comorbidity, 294(98%) completed the routine vaccination of their children.

Among parents 79(26.3%) has > 12 years children and 10(3.3%) completed the COVID-19 vaccination of their children. 232(77.3%) parents had taken 2 doses ofCOVID-19 vaccination. 32(10.7%) parents had family members with covid-19 infection and hospitalization due to severe disease. All parents used social media to take updates of covid-19 pandemic and vaccination. 252(84%) had got information from health care workers, 228(76%) from family physician, 198(66%) from friends, 183(61%) from neighbors, 156(52%) from family members. The sociodemographic characteristics and vaccination details of the parents are presented in table.1

Table-1: Sociodemographic characteristics and vaccination details of parents

Characteristics	N = 300(%)
Age(years)	
21-35	188 (62.7)
36- 50	112 (37.3)
Gender	
Male	156 (52)
Female	144 (48)
Religion	
Hindu	124 (41.3)
Muslim	77 (25.7)
Buddha	77 (25.7)
Sikh	22 (7.3)
Socio economic status*	
II	19 (6.4)
III	102 (34)
IV	175 (58.3)
V	4 (1.3)
Working in healthcare system	
Yes	27 (9)
No	273 (91)
Number of children	
1-2	219 (73)
3 and more	81 (27)
Routine immunization of children	
Complete	294 (98)
Incomplete	6 (2)
Having >12years child	
Yes	79 (26.3)
No	221 (73.7)
Covid-19 vaccination of children >12 years	
Parents with vaccinated >12yr child	10 (3.3)
Parents with unvaccinated >12yr child	69 (23)
Parents not having > 12yr child	221 (73.7)
Type of family	
Nuclear	170 (56.7)
Joint	55 (18.3)
Three generation	75 (25)
Number of family member	
1-5	198 (66)
>5	102 (34)
Covid-19 infection in family members	
Infected and hospitalized	32 (10.7)
Infected but not hospitalized	20 (6.6)
Not infected	248 (82.7)
Covid-19 vaccination in parents	
1 Dose	58 (19.3)
2 Dose	232 (77.3)
Unvaccinated	10 (3.3)
*No any parents belong to socioeconomic class I	

Fig-1: Parent's willingness for COVID -19 vaccination in children

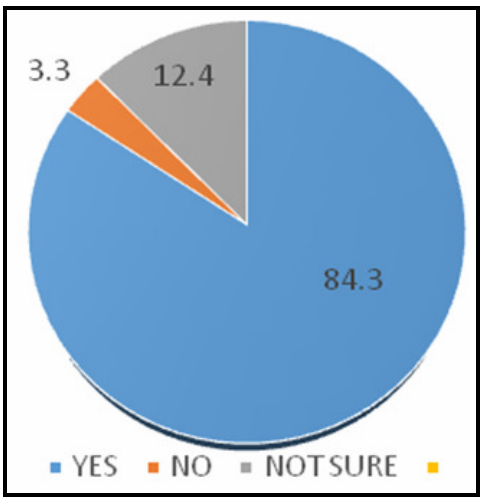

Figure 1 shows the willingness of parent's for covid-19 vaccination of their children, 84.3% were willing, 3.3% not willing, and 12.4 % not sure about vaccination.

Figure 2 shows the reasons for willingness, majority of parents 229(76.33%) wants keep other household members safe and 226(75.33%) were willing due to fear of getting sick.

Figure 3 shows the reasons for parental unwillingness, 44(0.14%) parents worried about side effects after vaccination 39(0.13%) parents unwilling due to new vaccine, 6(0.02%) parents think that vaccine will not prevent the infection.

Fig-2: Reasons for parental willingness to vaccinate their children with covid-19 vaccine

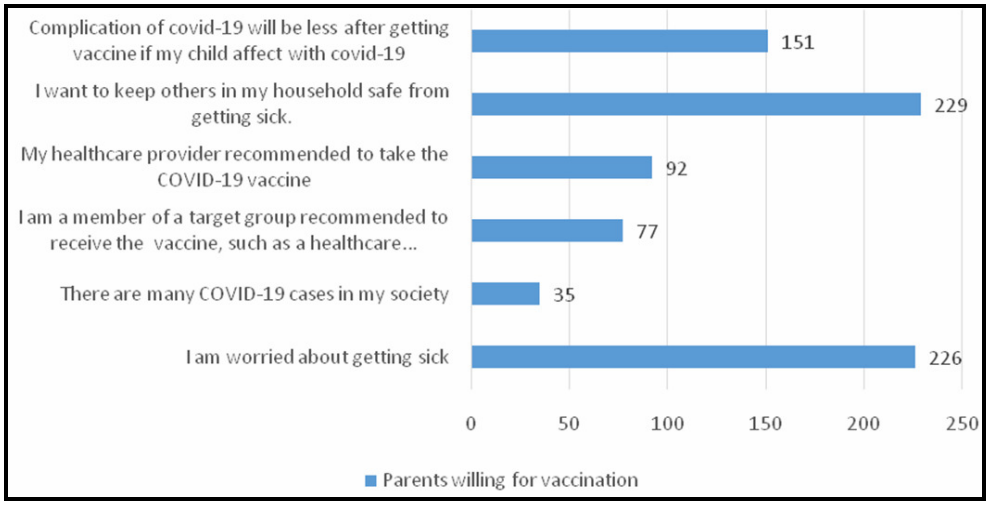

Fig-3: Reasons for parental unwillingness to vaccinate their children with covid-19 vaccine

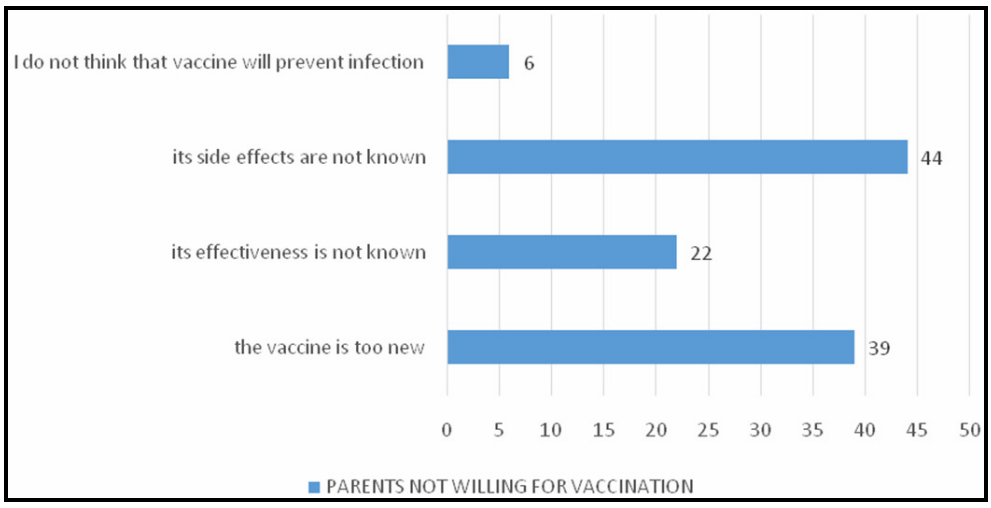

Table-2: Sociodemographic and other factors affecting the willingness of parents for children's covid-19 vaccination					
Characteristics		**Willing for vaccination**	**Not willing for vaccination****	**Chi square value**	**P value**
Sociodemographic factors					
Age	21-35	161(85.6)	27(14.4)	0.649	0.420
	36- 50	92(82.1)	20(17.9)		
Gender	Male	133(85.3)	23(24.4)	0.210	0.647
	Female	120(83.3)	24(16.7)		
Religion	Hindu	109(87.9)	15(12.1)	2.039	0.153
	Others	144(81.8)	32(18.2)		
Education	Illiterate to primary	30(75)	10(25)	5.423	0.060
	Middle to Intermediate	189(84.4)	35(15.6)		
	Graduation to post graduation	34(94.4)	2(5.6)		
Occupation	Professional	15(100)	0	6.441	0.040
	Skilled work	207(85.2)	36(14.8)		
	Unskilled work	31(73.8)	11(26.2)		
Income(in thousand)	< 30	235(83.6)	46(16.4)	1.662	0.197
	31 -60	18(94.7)	1(5.3)		
Socio-economic status ***	II	19(100)	0	5.689	0.058
	III	89(87.3)	13(12.7)		
	IV	145(84.3)	34(19)		
Working in healthcare system	Yes	27	0		0.012 FET
	No	226	47		
Number of children	Up to 2	191(87.2)	28(12.8)	5.097	0.024
	3 and more	62(76.5)	19(23.5)		
Type of family	Nuclear	137(80.6)	33(19.4)	7.836	0.020
	Joint	53(96.4)	2(3.6)		
	Three generation	63(84)	12(16)		
Number of family member	1-5	162(81.8)	36(18.2)	2.788	0.09
	>5	91(89.2)	11(10.8)		
Vaccination factors					
Routine immunization	Complete	250(85)	44(15)	5.462	0.019
	Incomplete	3(50)	3(50)		
Covid-19 vaccination in parents	1 dose	25(43.1)	33(56.9)	162.58	0.000
	2 dose	228(98.3)	4(1.7)		
	Unvaccinated	0	10(100)		
Covid-19 vaccination in children >12 years	Parents with vaccinated >12yr child	10(100)	0	6.793	0.033
	Parents with unvaccinated >12yr child	52(75.4)	17(24.6)		
	Parents not having > 12yr child	191(86.4)	30(13.6)		
Covid infection in family members					
Covid infection in family	Infected and hospitalized	31(96.9)	1(3.1)	6.685	0.035
	Infected but not hospitalized	19(95)	1(5)		
	Not infected	203(81.9)	45(18.1)		

*Others- Muslim Buddha Sikh. ** Not willing for vaccination- total of parents not sure and parents not willing to vaccinate their children with a covid-19 vaccine. *** Socioeconomic class IV, V combined.

In this study, age (P= 0.420) and gender (P= 0.647) was not significantly associated with the willingness of parents but younger parents was more willing compared to older, many times males are the decision maker in the family so males were more than females in both decision. When education factor studied, it was found that education (P=0.060) not significantly associated with willingness but less educated parents were more unwilling for vaccination than educated.

There was a significant association between type of family (P= 0.020), Occupation (P= 0.040), Socio-economic status (P= 0.058), Working in healthcare system (P= 0.012 FET) and willingness of vaccination.In this study, very high statistical significant difference was found among the covid-19 vaccination of parents (P=0.000), complete routine vaccination of children (P=0.019) and willingness. The parents who completed their covid-19 vaccination with 2 dose and completed routine immunization of their children as well as parents having > 12 year children (P= 0.033) with their covid-19 vaccination were more willing. The COVID-19 infection and hospitalization of family members (P= 0.035) due to it were significantly associated with willingness of parents for covid-19 vaccination of their children. There was also no association found between religion, income of parents and number of family members (Table 2).

Discussion

To curb the spread of the COVID-19 pandemic, safe and effective vaccine is needed. Vaccinating children against COVID-19 is critical as a public health strategy to reach herd immunity and prevent serious illness among children. [10] Government of India had started vaccination against covid-19 in adults in phased manner to protect the entire population. Vaccination >12years old children has started and next eligible group will be between 5-12 years old children.

Parent's willingness is an important determinant of success of Covid -19 vaccination in children as parents are decision makers. Fear, anxiety and stress among the parents about newly developed Covid -19 vaccine can become obstacle for the vaccine acceptance. This study was conducted to identify the various factors associated with willingness of parents for covid-19 vaccination of their children. Vaccination willingness was defined as the proportion of participants willing or likely to vaccinate their children against COVID-19 [11].

We found that 235(84.3%) parents were willing for vaccination, 10(3.3%) were not willing for vaccination and 37(12.4%) were not sure. Reported level of parents willingness in previous studies were 89% in England [12], 81% in Australia [13], 80% in United States [14] and New Zealand [15], 76 % in France [16]. One meta-analysis study reported 21.4-91.4% willingness of parents [11].

The most important reasons for willingness were the trust that vaccine could protect against disease and parents are worried about child's sickness, for protection of other household members and many health care worker, family physicians had given advice about vaccination, as the time passed in pandemic the severe complication of covid-19 had been seen by parents similar findings are found in the studies conducted in Saudi Arabia and Turkey [9, [17-18].

Another reason for the more willingness is might be due population-based vaccination program in adults, which led to an increasing willingness among parents this is similar with study done in Israel [19]. The factors associated with willingness for vaccination were working in skilful and professional occupation and health care system, living in joint family, parents completed their covid-19 vaccination, complete routine immunization of children, covid-19 infection and hospitalization in family members and parents with vaccinated > 12year old in family.

On the other hand, parents were concerned about safety and effectiveness of vaccine, worries about side effects of covid-19 vaccine being newly released. Some parents believe that vaccine will not prevent the infection. All these findings are consistent with the studies conducted in Saudi Arabia and Turkey [9, 17-18] the exposure to misinformation was associated with lower parental vaccine willingness. Social media is effective tool for dissemination of false data, false news,

misinformation, unverified rumours appearing on this platform [20]. Vaccines only provide immunity to the body by generating antibodies against the virus. One could get infected even after getting vaccinated. Vaccination can save lives by reducing the complications of infection [21].

The observed limitation of our study were willingness of parents for vaccination is dynamic, changes with legislation by government and public awareness policies. As this was a hospital based study the findings cannot be generalised to the total population. The vaccination willingness may not reflect the actual vaccination behaviour so studies at various interval are needed to see the actual vaccine acceptance when actual vaccine program for children will commence.

Conclusion

Important reasons of parental willingness were fear about getting sick, safety of family member, complication of covid-19, vaccination advised by health care workers. Parents were more concerned about newly developed vaccine, its side effect and unknown effectiveness. These can be reduced by using reliable source of information like family physician, health care workers. Targeted Counselling of parents at all level to relive the anxiety is needed like including Covid- 19 programs in school vaccination program, communicating clear information about vaccination and expected side effects of the vaccine.

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