



## PARENTAL ACCEPTANCE OF COVID-19 VACCINE AND DETERMINANTS OF VACCINE HESITANCY.

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**ABSTRACT** **Background:** Our study aimed to assess the parental acceptance of COVID-19 vaccination for their children and evaluate the factors influencing their decision toward vaccination. **Materials And Methods:** A cross-sectional survey in Tamil Nadu gathered data from parents of children aged 6 months to 18 years. It assessed their willingness to vaccinate both their children and themselves against COVID-19 and examined their opinions on the vaccine. The study used multistage random sampling and employed Chi-square tests to analyze factors influencing vaccination acceptance. **Results:** Among the 653 participants, 493 parents (75.5%) intended to vaccinate their children against COVID-19. Parents of children aged 12 to 18 years ( $p=0.0005$ ), parents aged 35 to 44 years ( $p=0.001$ ), parents who have not refused any vaccine in the past ( $p=0.0005$ ), parents who were aware of Covid19 vaccination drive for children ( $p=0.001$ ), parents who have received the vaccine for themselves ( $p=0.0005$ ) were significantly more likely to accept the Covid19 vaccine for their children. Parents who considered the vaccine safe and effective ( $p=0.0005$ ) had better acceptance. The Availability of free vaccines was identified as the major barrier toward vaccination (39%). **Conclusion:** Raising public awareness, enhancing routine childhood vaccination, and providing free vaccines can improve vaccination program effectiveness.

**KEYWORDS :** Covid-19 vaccine, Children, Parents, Vaccination refusal.

### INTRODUCTION:

Covid19 infection was declared a Global Pandemic by the WHO on January 2020[1]. Since then, the virus has undergone various mutations and WHO has coined the terms Variants of Interest and Variants of Concern to identify the changes at the earliest and take appropriate actions against these emerging strains [2]. From Jan 16 to 22, 2023 1.9 million new cases and 12000 deaths were reported globally, which amounts to a 13% increase in deaths over the past 1 month [3].

Wearing masks, hand hygiene, and social distancing are the measures being practiced for the prevention of Covid19 infection. The social, mental, and economic impact associated with the lockdown and quarantine was huge [4]. The advent of Covid19 vaccines is a breakthrough towards protection against the Covid19 virus.

In India, the vaccine drive began in May 2021 and was introduced in a phased manner to involve all adults >18 years of age. Children aged 15 to 18 years are given the Covaxin vaccine and children aged 12 to 14 years are given the Corbevax vaccine from Jan 2022 and March 2022 respectively [5]. According to UNICEF, there are 444 million children under 18 years of age in India [6]. Of these, 86 million children have received both doses of the COVID vaccine which is about 20 % of the pediatric age group [7]. The CDC recommends Covid19 vaccination for children from 6 months of age [8]. In India, the Covid19 vaccines are under trial for children <12 years and will be soon released into the market for vaccinating children.

Though the burden of Covid19 cases in children is less and most infections are asymptomatic, still vaccinating children is vital because of risk of severe disease and death in high-risk children with comorbidities, risk of transmission through children to adults who may contribute to the perpetuation of infection and surge in cases, risk of potential complications like Multisystem inflammatory syndrome in children and long-term covid symptoms [9].

The success of any vaccination program relies on the parental acceptance, thus knowing the factors influencing their decision will improve vaccine coverage. The concerns about the safety and efficacy of the vaccine coupled with false information circulating through social media have led to a decrease in uptake of the vaccine [10]. Most of the available data on Covid 19 vaccine hesitancy are from high income countries, hence we have done this study to estimate vaccine acceptance and the factors influencing it among parents of children aged six months to 18 years in Tamilnadu, India.

### METHODOLOGY:

A community-based cross-sectional survey was conducted in Tamilnadu using a self-administered questionnaire from Jan 15, 2023, to February 15, 2023.

### Study Population:

Parents or guardians of children aged six months to 18 years willing to participate in the study and able to make an informed decision were included in the study. Parents of children having comorbid conditions precluding vaccination and those who could not read and write were excluded from the study.

With a 60% vaccine hesitancy prevalence obtained from previous studies considering a precision level of 0.05, the sample size was estimated to be 367, allowing for a 10 % increase for missing data the effective sample size was estimated to be at least 406 participants [11].

### Questionnaire:

Information about the study, investigator details, the right to make a voluntary decision to participate in the study, and the right to withdraw from the study at any point was followed consent. The participation was voluntary, anonymous, and confidential.

The questionnaire consisted of four sections covering demographic details of the participants, Willingness to vaccinate Children against Covid19, Willingness to vaccinate themselves against Covid19, Opinions on Covid 19 vaccines like safety, efficacy and accessibility.

Willingness to vaccinate was assessed by a 4-point Likert scale of "Yes, unsure but leaning towards yes, unsure but leaning towards no, and No". Opinion on Covid was assessed by a 5-point Likert scale of Strongly agree to Strongly disagree. The questionnaire was pretested and then used for the study.

### Data Collection:

Four districts from Tamilnadu namely Madurai, Erode, Thanjavur, and Chennai were selected by random method. Checkanurani PHC from Madurai, Chennimalai PHC from Erode, Nadukaveri PHC from Thanjavur, and Mandaveli PHC from Chennai were selected randomly. A List of houses with children under 18 years of age was obtained from the Auxiliary Nurse Midwife. The houses were sampled by stratified sampling technique. 172 houses from Chennai, 163 houses from Madurai, 158 houses from Thanjavur, and 160 houses from Erode districts were sampled. If there are multiple children in a family, responses were obtained for the youngest child. After obtaining

consent in the local language, parents answered a self-administered questionnaire.

#### Data Analysis:

The collected data was analyzed with IBM SPSS Statistics version 23. For descriptive statistics frequency analysis and percentage were used. To find significance in categorical data Chi-square tests were used. Statistical significance was considered at  $p < 0.05$ .

#### RESULTS:

The questionnaire reached 821 parents of which 653 accepted to participate with a response rate of 79.5%. The majority of the responses (62.7%) were from the parents of children aged 12 to 18 years of which 46% have vaccinated their children already with at least one dose of vaccine. Most of the responses were from the mother (62.1%), parents aged 35 to 44 years (45.0%), having an undergraduate or postgraduate degree (46.2%) and either not working (38.1%) or working in nonhealthcare related sectors (43.1%) at the time of interview. More than 90% of parents have not avoided any vaccines in the past and only 70 % were aware that Covid19 vaccination is available for Children in India.

Nearly 75% of the parents were willing to vaccinate their children against Covid19 of which 46% had already vaccinated their children with one dose of vaccine [TABLE:1].

**Table 1: Willingness To Vaccinate Children**

WILLINGNESS	NUMBER	PERCENTAGE
Yes	493	75.5
Unsure but leaning towards Yes	130	19.9
Unsure but leaning towards No	18	2.76
No	12	1.84
TOTAL	653	100

The remaining people (25%) were either unsure or not willing to vaccinate their children against Covid19. At the time of the study, 86% of the parents had already taken the vaccine [TABLE:2].

Of the respondents who accepted to vaccinate their children, there was a statistical correlation between those who already received the vaccine and those willing to vaccinate their children ( $p=0.0005$ ).

**Table 2: Willingness To Vaccinate Self Against Willingness To Vaccinate Children**

	YES	UNSURE BUT LEANING TOWARDS YES	UNSURE BUT LEANING TOWARDS NO	NO	TOTAL	df	P value
WILLINGNESS TO VACCINATE SELF	N(%)	N(%)	N(%)	N(%)	N(%)	12	0.0005
No	10 (2.0)	2(1.5)	0(0)	5(41.7)	17(2.6)		
Unsure but leaning towards No	0(0)	0(0)	2(11.1)	1(8.3)	3(0.5)		
Unsure but leaning towards yes	3(0.6)	6(4.6)	2(11.1)	0(0)	11(1.7)		
Yes I am willing to take the vaccine	40 (8.1)	14(10.8)	3(16.7)	1 (8.3)	58(8.9)		
Yes I have already taken the vaccine	440 (89.2)	108(83.1)	11(61.1)	5(41.7)	564(86.4)		
Total	493 (100)	130(100)	18(100)	12(100)	653 (100)		

Parents of children aged 12 to 18 years were more likely to vaccinate their children with a statistical significance of p-value

0.0005[TABLE:3]. Parents who have not refused any vaccine in the past and those who were aware of Covid vaccination drive in India were more likely to vaccinate their children [ $p = 0.0005, 0.001$  respectively].

**Table 3: Willingness To Vaccinate Against Demographic Characters**

	VARIABLE	YES	UNSURE BUT TOWARDS YES	UNSURE BUT TOWARDS NO	NO	TOTAL	Df	P value
AGE OF THE CHILD	6 mo to 3yrs	30(6.1)	17(13.1)	5(27.8)	2(16.7)	54(8.2)	9	0.0005
	4 to 6yrs	43(8.7)	13(10.0)	2(11.1)	2(16.7)	60(9.2)		
	6 to 12yrs	86(17.4)	38(29.2)	4(22.2)	1(8.3)	129(19.8)		
	12 to 18yrs	334(64.7)	62(47.7)	7(38.9)	7(58.3)	410(62.8)		
GENDER	Male	276(56.0)	66(50.8)	11(61.1)	6(50.0)	359(55.0)	3	0.676
	Female	217(44.0)	64(49.2)	7(38.9)	6(50.0)	294(45.0)		
YOUR AGE	18-24	55(11.2)	11(8.5)	0(0.0)	3(25.0)	69(10.5)	12	0.001
	25-34	82(16.6)	45(34.6)	5(27.8)	3(25.0)	135(20.7)		
	35-44	225(45.6)	52(40.0)	12(66.7)	5(41.7)	294(45.0)		
	45-54	117(23.7)	20(15.4)	1(5.6)	1(8.3)	139(21.3)		
	≥ 55	14(2.8)	2(1.5)	0(0.0)	0(0.0)	16(2.5)		
	≥ 55	14(2.8)	2(1.5)	0(0.0)	0(0.0)	16(2.5)		
YOUR OCCUPATION	Healthcare and allied	89(18.1)	23(17.7)	5(27.8)	5(41.7)	122(18.7)	6	0.445
	Non healthcare related	217(44.0)	55(42.3)	6(33.3)	4(33.3)	282(43.2)		
	Not working at present	187(37.9)	52(40.0)	7(38.9)	3(25.0)	249(38.1)		
HAVE YOU AVOIDED ANY OTHER VACCINE IN THE PAST	No	471(95.5)	113(86.9)	15(83.3)	7(58.3)	606(92.8)	9	0.0005
	Yes, because I felt it is not necessary	14(2.8)	12(9.2)	3(16.7)	3(25.0)	32(4.9)		
	Yes, because of allergy/side effect	6(1.2)	4(3.1)	0(0.0)	2(16.7)	12(1.8)		
	Yes, because of use of cost	2(0.4)	1(0.8)	0(0.0)	0(0.0)	3(0.5)		
	Yes, because of use of cost	2(0.4)	1(0.8)	0(0.0)	0(0.0)	3(0.5)		
ARE YOU AWARE THAT COVID19 VACCINATION HAS BEEN STARTED FOR >12 YEAR OLD CHILDREN IN INDIA	Yes	365(74.0)	74(56.9)	13(72.2)	6(50.0)	458(70.1)	3	.001

	No	128(26.0)	56(43.1)	5(27.8)	6(50.0)	195(29.9)		
	Total	493(100.0)	130(100.0)	18(100.0)	12(100.0)	653(100)		

Those who felt that the available Covid vaccine is safe and effective were willing to vaccinate their children [TABLE:4]. Paradoxically, those who have received negative information on Covid through media were willing to vaccinate their children [p - 0.001]. More people agreed to vaccinate their children if their colleagues or neighbors are vaccinating [p value 0.0005].

**Table 4: Willingness To Vaccinate Against Opinion On Covid**

		YES	UNSURE BUT TOWARDS YES	UNSURE BUT TOWARDS NO	NO	TOTAL	df	p value
I FEEL THE COVID VACCINE AVAILABLE IN INDIA IS SAFE AND EFFECTIVE IN PREVENTING SEVERE DISEASE	Strongly agree	247(50.1)	48(36.9)	3(16.7)	2(16.7)	300(45.9)	12	0.0005
	Agree	11(2.2)	7(5.4)	2(11.1)	1(8.3)	21(3.2)		
	Neutral	110(22.3)	62(47.7)	12(66.7)	5(41.7)	189(28.9)		
	Disagree	111(22.5)	10(7.7)	1(5.6)	1(8.3)	123(18.8)		
	Strongly disagree	14(2.8)	3(2.3)	0(0)	3(25.0)	20(3.1)		
I FEEL THE COVID19 IS NOT SEVERE IN CHILDREN, SO NO NEED TO VACCINATE THEM	Strongly agree	38(7.7)	15(11.5)	6(33.3)	5(41.7)	64(9.8)	12	0.0005
	Agree	200(40.6)	45(34.6)	6(33.3)	2(16.7)	253(38.7)		
	Neutral	103(20.9)	51(39.2)	5(27.8)	2(16.7)	161(24.7)		
	Disagree	15(3.0)	6(4.6)	0(0)	1(8.3)	22(3.4)		
	Strongly disagree	137(27.8)	13(10.0)	1(5.6)	2(16.7)	153(23.4)		
I HAVE SEEN NEGATIVE INFORMATION ABOUT THE VACCINE ON SOCIAL MEDIA	Strongly agree	111(22.5)	45(34.6)	6(33.3)	0(0)	162(24.8)	12	0.001
	Agree	184(37.3)	30(23.1)	1(5.6)	3(25.0)	218(33.4)		
	Neutral	112(22.7)	40(30.8)	8(44.4)	5(41.7)	165(25.3)		
	Disagree	28(5.7)	6(4.6)	0(0)	2(16.7)	36(5.5)		
	Strongly disagree	58(11.8)	9(6.9)	3(16.7)	2(16.7)	72(11.0)		
I FEEL IF MY FRIEND/COLLEAGUES VACCINATE THEIR CHILDREN THEN I WILL ALSO VACCINATE MY CHILD	Strongly agree	174(35.3)	54(41.5)	3(16.7)	0(0)	231(35.4)	12	0.0005
	Agree	96(19.5)	20(15.4)	8(44.4)	7(58.3)	131(20.1)		
	Neutral	97(19.7)	44(33.8)	5(27.8)	4(33.3)	150(23.0)		
	Disagree	70(14.2)	9(6.9)	1(5.6)	0(0)	80(12.3)		
	Strongly disagree	56(11.4)	3(2.3)	1(5.6)	1(8.3)	61(9.3)		
	TOTAL	493(100)	130(100)	18(100)	12(100)	653(100)		

#### Demographic characteristics:

In our study, acceptance was more among parents of adolescent children which is similar to a study by Szilyagi et al [16]. This could be because of more safety concerns among the parents of younger children. We did not find any association between vaccine hesitancy among mothers and fathers contrary to other studies in which mothers had more acceptance than fathers [17]. Parents aged 35 to 44 years had more acceptance towards the vaccine contrary to the study by El-Elmat et al in which >35 years people had lower acceptance towards the vaccine [18]. In India 35 to 45 years are the working population, hence can have more exposure to information which could lead to more acceptance among them. Contrary to other studies, there was no significant difference in the acceptance rates among parents having diplomas versus postgraduate degrees [19]. This may be because irrespective of educational status knowledge of Covid19 is the underlying factor influencing the decision to vaccinate. There was no difference in acceptance among healthcare workers versus people working in non-healthcare sectors. Various studies have shown varied acceptance rates among healthcare workers with few showing higher acceptance and some showing lesser acceptance among the HCWs [20–22]. Thus, knowing the vaccine hesitancy in a particular country is important to take necessary actions to decrease vaccine hesitancy among HCWs, as this could lead to a higher infection rate and lower vaccination drive among the HCWs. Parents who have not refused any vaccine in the past had significantly higher acceptance towards Covid 19 vaccine. Childhood vaccination status could serve as a screening tool to determine vaccine hesitancy towards Covid19 and tailor vaccination campaigns accordingly. Parents who were aware of the vaccination drive in India had higher acceptance to Covid19 vaccine. This underlines the importance of health education to improve vaccination rates among the public.

#### Parental vaccination status:

Parents who had already received Covid19 vaccine themselves had a positive attitude towards vaccinating their Children. This is similar to a

#### DISCUSSION:

Vaccine hesitancy or refusal is defined as delaying or refusing vaccination despite the availability of vaccination services [12]. Vaccine refusal is perceived as a major threat and harms COVID-19 control measures. Hence understanding the reasons behind the refusal is crucial to address the issues and improve the implementation of the vaccination program.

In our study, 75.5% accepted vaccination of their children which is similar to a study from China but higher than the studies from high-income countries like Japan and Italy [13–15].

study from Wisconsin [19]. Vaccinated parents will have a better understanding of the safety of the vaccine and have lower vaccine hesitancy to vaccinate their children.

#### Opinion on covid vaccine:

The SAGE group of experts has identified Confidence, Complacency, and Convenience as the 3 major determinants of vaccine hesitancy [12]. The 5C scale by Betsch et al measures Confidence, Complacency, Constraints, Calculation, and Collective responsibility to know the hesitancy towards Vaccination [23]. Various studies have mentioned that negative information on vaccines adversely affects the acceptance of vaccination [10,24–26]. Hence these factors were analysed.

#### Confidence:

Parents who believed that the vaccine is safe and effective had significantly higher acceptance of the vaccine, similar to reports from other studies in Japan, Italy, Turkey, and Saudi [14,15,27,28].

#### Collective responsibility:

As per experts, vaccinating 55 to 82% of the population is essential to achieve herd immunity [29]. In our study, 55% either agreed or strongly agreed to vaccinate if either friends or colleagues vaccinate their children. This necessitates campaigns to improve vaccination coverage as focus groups.

#### Constraints:

Availability of free vaccine (39%), inconvenient timing (9%) and distance of the vaccination centre were identified as the major constraints. Addressing these barriers could improve vaccination in these groups.

#### Misinformation:

Nearly 55% of the parents have received negative information through social media. But paradoxically those people had higher acceptance of vaccination. This could be because of the ability to discard them as

false information.

### Limitations:

Firstly, since it is a cross sectional study involving a limited geographic area, we recommend further studies on large scale. Secondly it is not reflecting the changing attitude towards vaccination. Still, this is one of the very few studies to identify the barriers towards Covid19 vaccine in India and provides valuable inputs for policy recommendations.

### CONCLUSION:

The development of Covid19 vaccine is a breakthrough in the preventive measures against Covid19. Addressing vaccine hesitancy is important for the effective implementation of the vaccination program. In our study, nearly 75% of parents strongly agreed to vaccinate their children. We found various factors influencing their decision towards or against vaccination. Parents aged 35 to 44 years, parents of adolescent children, Parents who have not refused any vaccine in the past, who had received Covid19 vaccine for themselves had better acceptance. Hence this information could serve as a screening tool to assess baseline vaccine hesitancy and tailor the vaccine implementation strategies. Those who were aware of the vaccination being available for children, and who believed that the vaccine is safe and effective had better acceptance. Thus, public health campaigns to increase awareness and trust among the people are crucial.

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