

## A Study to Understand Parents' Perceptions and Societal Attitudes on Bharat Biotech's Covaxin for Children

Akanksha Nadkarni<sup>1</sup>, Ishu Sharma<sup>2</sup>, Sonali Kudale<sup>3</sup>, Shubham Shetye<sup>4</sup>, Rajesh Kumar Nair<sup>5</sup>, Modhi Aljuaid<sup>6</sup>, Majdi Quttainah<sup>7</sup>, Liem Gai Sin<sup>8</sup>

SIES School of Business Studies<sup>1,2,3,4,5</sup>

Kuwait University<sup>6,7</sup>

Universitas Machung<sup>8</sup>

Correspondence Email: [ishu.sharma1999.is@gmail.com](mailto:ishu.sharma1999.is@gmail.com)

### ARTICLE INFORMATION

#### Publication information

#### Research article

#### HOW TO CITE

Nadkarni, A., Sharma, I., Kudale, S., Shetye, S., Nair, R. K., Aljuaid, M., Quttainah, M., & Sin, L. G. (2022). A Study to Understand Parents' Perceptions and Societal Attitudes on Bharat Biotech's Covaxin For Children. *Journal of Community Development in Asia Pasific*, 5(3), 98-114.

#### DOI:

<https://doi.org/10.32535/jcda.v5i3.1869>

Copyright©2022 owned by Author(s).  
Published by JCDA



This is an open-access article.  
License: Attribution-Noncommercial-Share Alike (CC BY-NC-SA)

Received: 25 June 2022  
Accepted: 20 July 2022  
Published: 20 September 2022

### ABSTRACT

The recent COVID-19 pandemic has reshaped the perceptions of vaccines worldwide. Presently, vaccines are the most efficacious resource that holds the strength to reduce the risk of the disease. In contrast, public health authorities are concerned about vaccine apprehension among the general public. The distribution and consumption of these vaccines began by segregating the age groups. The eligibility of Covaxin vaccines manufactured by Bharat Biotech for children over 12 years of age makes it critical to investigate its credibility among the parents and public views regarding children receiving these vaccines. This research study aims to learn more about parents' perspectives and societal attitudes towards immunity building in children by the Covaxin vaccines. This research combine a descriptive and analytical method. Furthermore, the methodology adopted here leads to a precise understanding if there is any ambiguity or acceptance towards Covaxin for children in the minds of the general public. The results show that parents are willing to vaccinate their children with moderate immunity. Thus, the child's immunity is one of the factor that influenced the parent's attitude towards Covaxin.

**Keywords:** Bharat Biotech, Children, Clinical Trial, Covaxin, COVID-19, Immunity, Perception.

## **INTRODUCTION**

### **Overview of the COVID-19 Vaccine**

The COVID-19 pandemic began worldwide towards the end of 2019. Immediately after the official declaration of the global pandemic in March 2020, India imposed a full-scale lockdown and swiftly implemented preventive and administration strategies. This is in line with the research of Nair et al. (2022), who said that the health authorities suggest people to stay at home due to the fast-paced spread of coronavirus. Therefore, vaccine development and deployment was an effective strategy as vaccines are a powerful weapon for disease prevention. India launched the world's most extensive COVID-19 vaccination campaign in January 2021, using two indigenous vaccines, Covishield and Covaxin. Vaccination drives began in March 2021 with frontline and healthcare workers, the elderly, and those with comorbidities and were later expanded to all adults (18 years or more). These vaccines required two doses, separated by a few weeks.

India has provided over 1.3 billion doses of vaccines to its adult population by the end of 2021. Even though most of India's adult population was vaccinated, a small percentage of those who were reluctant chose to stay unvaccinated. According to statistics, about 7% of adults are currently hesitant to be vaccinated. This resulted in a phase of vaccine hesitancy among individuals who were unsure about vaccinations or chose to delay or avoid vaccinations even when they were readily available, depicting the importance of clearance of these doubts that prevent citizens from getting vaccinated against COVID-19. Furthermore, limited information on public acceptability and trustable opinions contribute to vaccine hesitancy among parents. Consequently, the major deciding factors are getting accurate data about Covaxin's clinical trial by Bharat Biotech, the persistence and nature of the child's immune response, and reassurance from society. As a result, the Indian government put the whole responsibility of vaccine production, distribution, and supply on India's leading biotech companies.

### **Bharat Biotech International Limited (BBIL)**

In developing countries, such as India, the cost, quantity, and quality are the three primary parameters that form the foundation of any Biotech company in the healthcare sector. Making healthcare products and facilities economically viable for such a vast population is a challenge to any government, especially during COVID-19, when everything was majorly unpredictable, and the whole nation was waiting for a vaccine miracle. The entire country was dependable on medical infrastructure. Bharat Biotech International Limited (BBIL), with top-quality manufacturing ability, was the ultimate hope for India.

Bharat Biotech is a multinational biotechnology company based in Hyderabad, India, specializing in drug discovery, development, and manufacturing of vaccines, biotherapeutics, pharmaceuticals, and healthcare products. Their Research and development team successfully developed Covaxin, India's first vaccine for COVID-19, in partnership with the Indian Council of Medical Research (ICMR). After receiving the approval of DCGI (Drugs Controller General of India) for the first and second phases of Human Clinical Trials in July 2020. It has now conducted Phase three efficacy trials with 25,800 subjects.

Covaxin was formulated by Whole-Virion Inactivated Vero Cell-derived platform technology to win the battle against the COVID-19 pandemic. As said by health experts, it is an inactivated vaccine that does not replicate and is unlikely to revert

and make pathological effects. It contains dead viruses that are incompetent to contaminate people but still capable of instructing the immune system to ascend a defensive response against the virus. In India, the consumption of vaccines began among senior citizens, and now it has come to a stage where children of the age groups 5 to 12 can get vaccinated.

#### **Defining Parental and Societal Attitudes Towards Vaccine Hesitancy**

Infections in children account for roughly 14% of Covid-19 occurrences. While most SARS-CoV-2 infections in children are milder than in adults, many cases of multisystem inflammatory syndrome have been recorded in boyh adolescents and children. Even though children showcase mild symptoms of COVID-19 and are not frequent to huge complications, there are still health risks associated with children who are not yet vaccinated. Also, the students must be vaccinated for schools to provide offline education and resume extra-curricular activities. Especially children with medical issues related to the heart, lungs, kidneys, and more need Vaccination to reduce the risks of COVID-19.

Adults may decline or be concerned about having their children vaccinated as vaccine hesitancy causes them anxiety. Soon Covaxin will be provided to the children, and there are unwillingness and thoughts of unacceptability in parents' minds. Parents are the decision-makers of actions towards their children and are influenced mainly by community beliefs. Therefore, it has become important to investigate the perceptions and societal attitudes on COVID-19 vaccines for children to develop the necessary strategies to overcome hesitancy. Furthermore, many research papers have highlighted that cost, religion, philosophical institutions, or willingness to wait for more information leads to cancellations or delaying. As a result, it is beneficial for the Indian government, pharmacists, and other healthcare workers to learn about the reasons for hesitancy to educate the families better. It is critical to provide parents with the knowledge to make informed immunization decisions for their children.

From the explanation above, the **primary objective of the research** is to understand the perceptions of parents and society towards Bharat Biotech's Covaxin for children. We also want to learn the perceived safety, immunity, and efficacy beliefs of Covaxin for children. Also, to find the factors influencing the acceptance and generating hesitancy towards COVID-19 vaccines for children.

### **LITERATURE REVIEW**

Community plays an important role in influencing the mind of an individual (Dutta et al., 2021). The intake of vaccines somehow depends on perceived notions of a community and is delivered to us subconsciously. Those research paper uses the Social-Ecological Model to determine the obstacles and enablers of Indian community dealings with vaccination. It states that the vaccine policy influences neighborhoods. It highlights the need to develop a detailed manual that guides population-based operational activities and overcomes the barriers.

Health authorities are constantly running to overcome any hesitancy that prevents a person from getting vaccinated. These hesitant attitudes toward COVID-19 vaccines must be evaluated to increase vaccine acceptance among the public. The researchers find out that safety and expenditure concerns discourage most of the population from getting COVID-19 vaccines. Hence, there is a need to design a multimedia awareness campaign that spreads reliable information addressing the

problems. Emphasizing the robust technology and protocols being followed while producing the vaccines can generate acceptability in public.

According to McKee and Bohannon (2016), parents make the decisions for their children. They may refuse to vaccinate their children. This detailed study categorizes parents' concerns to understand the primary reasons behind their unacceptability of vaccines. Religion, safety and cost concerns, personal beliefs, and the desire to wait for more information on vaccines are the primary reasons that affect parents' decisions regarding their children's immunization.

The COVID-19 vaccine for children is secure and effective as it prevents them from spreading COVID-19 to others, like family and friends in school (Kostoff et al., 2021). As said by the experts, the Pfizer COVID-19 vaccine for kids effectively stops COVID-19. However, those research paper highlights the side effects after vaccination based on age, not weight, and it differs from adults. That paper states that the younger age groups have a lower risk of death from COVID-19 and an increase in the risk-benefit ratio. Kostoff et al. (2021) discuss children's problems related to COVID-19 vaccinations. The majority of the deaths are the senior population with continual diseases. In children, the demise is low. The prediction changed into susceptibility for teens and children due to their lower risk rates. This study states that the trials performed did not represent the whole population as they were tested in a hurry. The clinical trials now no longer dealt with the long-time period outcomes and did now no longer deal with adjustments in biomarkers. The research study follows a systematic review of issued and continuing clinical investigations on the COVID-19 vaccination safety and efficacy in children (Lv et al., 2021). The COVID-19 vaccines have protective results in kids and youngsters, however, cognizance is necessary to display adverse effects that may occur after injection.

The study by Vannice et al. (2011) deals with the parent beliefs and attitudes who are worried about the effect of immunization time. Involving 272 mothers with immunization concerns participated in the study, the review showed that mothers in all groups responded positively to questions and statements supporting the vaccine safety and importance (Vannice, 2011). Participating mothers indicated that they would prefer to have vaccine information before the first vaccination visit. As per the research, the distribution of vaccine-information pamphlets and Vaccine Information Statements improved attitudes about vaccination significantly.

Mc Elfish (2022) analyzes the intentions of the parents & guardians of children in a specific age group to vaccinate their children. A survey was undertaken to assess the parent and guardian intentions to vaccinate their children against COVID-19; the target group was parents or guardians with older children in the age group 12 to 17 years and 0 to 11 years. About 19% of parents/guardians confirmed their children was vaccinated. About 34% reported they would get their child vaccinated immediately. About 28% would only have their child vaccinated only if their schools required it. The education of the parents/guardians about the vaccination, COVID-19 vaccination status, and vaccine hesitancy played a major role in their intention.

On the other hand, the U.S. Food and Drug Administration has authorized the emergency use of the Pfizer- BioNTech COVID-19 Vaccine in children 5 to 11 years of age (FDA, 2021). It was done based on a randomized, placebo-controlled study & evaluation of the available data. The vaccine was 90.7% effective. The vaccine is administered in two doses, three weeks apart. The vaccine gives mild to moderate

side effects, and most went away within one to two days. Based on efficacy and safety data from pediatric phase II and III interim trial results, the Indian government approved Covaxin (Narayan, 2021). Children constitute a low risk for COVID-19 hospitalization, mortality, and complications and mostly show mild symptoms. However, a comprehensive study prevents parents from vaccinating their children as it is time-consuming but is required to reduce parental anxiety with accurate information or facts figures.

A total of 22% children and adolescents all COVID-19 positive cases were recorded so far, and hospitalizations among this group have increased (Morgan, Schwartz, & Sisti, 2021). Children account for low-risk and high-benefit healthcare interventions. Those paper highlights that state laws should allow minors to consent to vaccinations without the consent of their parents. Some older youngsters may better know the vaccine's hazards and benefits than their apprehensive guardians. Current regulations can be leveraged to build new possibilities for allowing children to consent to vaccinations.

Covaxin (indigenous, Bharat Biotech) or Covishield is given to adults and showcases effective results. The World Health Organization recently emphasized that vaccination is critical for children. This report highlights a few essential parameters for the vaccination drive to succeed among children. The paper highlights that parents prefer proven policy decisions to decide to vaccinate their children. The safety, reactogenicity, and immunogenicity of COVAXIN are demonstrated in pediatric clinical trials (Bharat biotech, 2021). Its research study included 976 healthy children and adolescents aged 2 to 18, with 374 reporting mild or moderate-intensity symptoms. Moreover, it highlights that antibody responses in children are detected. Their neutralizing antibodies are 1.7 times higher in children than in adults. Meanwhile, Babicki, Pokorna-Kalwak, Doniec, and Mastalerz-Migas (2021) find out how Polish parents felt about their children receiving COVID-19 vaccinations. Its study was carried out by collecting replies to the original questionnaire via the internet. It highlights that mothers have higher positive sentiments towards COVID-19 vaccination. Also, the parents are surrounded by a range of emotions and concerns, which may lead to an extension in getting their child vaccinated against COVID-19.

Another study by Temsah et al. (2021) determines how pleasingly the parents of Saudi Arabia accepted the COVID-19 immunization for their children. A total of 47.6% of 3,167 parents were determined to vaccinate their children (Temsah et al., 2021). The most common cause for vaccine refusal was a lack of knowledge and accurate data regarding the vaccine for children. However, parents are concerned about the vaccine's adverse effects. Therefore, most parents are cautious of the vaccine due their uncertainty of its efficacy and safety for their children.

## **RESEARCH METHOD**

This research study is partially descriptive and partially analytical. The primary purpose of descriptive research was to understand the parent's perception of COVID-9 vaccination for children of age 12 and above. At the same time, an analytical study was examined to understand parental behavior towards vaccination in detail. The Indian government approved Bharat Biotech's Covaxin based on efficacy and safety data from clinical trials II and III. But many parents fear giving the COVID-19 vaccine to their children due to concerns about its efficacy and safety. So, to understand the behavior of the parents towards the use of vaccination

in children, we have used both primary and secondary research methodology.

### **Primary Research**

Primary research involves the collection of original data which is specific to a particular research project. While performing primary research, the researcher gathers first-hand information rather than choosing readily available information in any database. Primary research is carried out to build new knowledge, so it is also referred to as original research. We can answer unique questions that were never asked or answered by doing preliminary research, leading to the initial set of goals. Therefore, primary research can produce reliable and relevant data for the researcher. Moreover, prior research is customizable as instruments like structured questionnaires, surveys, and interviews can be set according to the standardization level. Therefore, it is ideal for researchers seeking high control over data collection methods as it involves a process-oriented inquiry for efficient results.

A survey was conducted to understand the parent's perceptions and societal attitudes on COVID-19 vaccines for children. It comprised 12 questions which 110 respondents answered. The main aim of the primary research was to understand parents' attitudes towards the factors that determine the safety and efficacy of COVID-19 vaccines. This survey consists of multiple-choice questions and close-ended questions. And this survey shows an objective approach to understanding the parents' perceptions. This survey helped us discover if there is any ambiguity or acceptance towards Covaxin for children in the minds of the general public.

### **Secondary Research**

Secondary research summarizes or synthesizes data and literature organized and published by others. It is a common way of conducting a systematic investigation that relies exclusively on gathered information. This research plan involves arranging, combining, and evaluating the data samples for accurate results. Secondary research is also called desk research since it integrates data from the internet, peer-reviewed publications, textbooks, government archives, and libraries. Here, the researcher uses and analyzes the data from primary research sources while doing secondary research. It helps outline the scope of a study and sets the stage for field research. The data for secondary research was collected from over 15 research papers based on vaccination. Articles were referred to understand the parents' perception toward vaccinating children aged 12 and above. This research methodology played an essential role in understanding the importance of vaccination to children and the parental thoughts towards childhood vaccination. Researchers can find it challenging to determine the authenticity of the data as they are not directly involved in the secondary research process. So, there is a fear that invalid data can negatively affect research outcomes. Hence, our study needs to evaluate data efficiently before using it. This methodology shows the subjective approach of the study. This research acknowledges the source of information that parents rely on to get their children vaccinated.

Furthermore, sampling is a method of choosing a subset of the population for statistical inferences and characteristic estimation of the whole population. It is a process where the researchers select a sample from the population for their studies. A sample is the subpart of the population. Before sample selection size of the sample is fixed according to population.

We gathered 110 respondents from all over the world to study parent perceptions of COVID-19 vaccination for children. It is essential to carefully define your target

population according to the purpose and practicalities of a study. Efficient sampling offers multiple benefits when a researcher knows how and where to sample. Finding participants that fit the definition of a project is crucial because it allows researchers to gather high-quality data. If the population is very large, demographically mixed, and geographically dispersed, it might be challenging to access a representative sample. To conduct this survey, a structured questionnaire was created online by using a Google form distributed to parent groups on social media. They were parents of children ranging in age from 11 to 18 years old. Those who were undecided about whether or not to vaccinate their children were included in this study.

Quality sampling is required for the generalization of the problem. Probability Sampling was used as the sampling method. It is also called "Chance Sampling" or "Random Sampling" in which a known probability of each population member is selected. Each member is highly chosen in a sample when the population is highly homogenous. It ensures that each member has an equal and fair chance to be selected. This aimed to learn whether parents wanted to vaccinate their children and their perceptions of the vaccine's safety and efficacy.

For our research, it was important to have access to every member of the population as it ensures data collection from each member of the sample. Furthermore, deciding the sample size for our research was crucial, as it played an important role in analyzing the study. A balanced subset with tremendous potential for representing the larger group as a whole is free from any bias. The randomized selection of a small section of individuals or members from a whole population for a particular study is the simple random sampling. The sample are randomly and purely by chance. Hence, the sample quality is not affected. In this survey, participants were asked to share their opinions on vaccination, side effects, their child's age, immunity, clinical studies, and reasons for not vaccinating.

Every parent with a child's opinion was recorded on a 10-point scale to determine their level of satisfaction. Parents respondents were asked to rate items on a scale of 0 to 5, with 0 representing "least" and 5 representing "most." For example, the parent respondent rated the following questions: child immunity, factors affecting vaccine safety and efficacy, quality, and long-term effects.

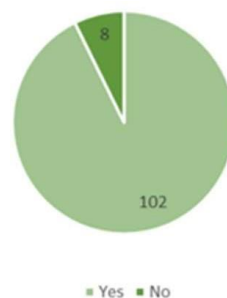
## **RESULTS**

**Table 1.** Data Collection Demographics

Age (Years) of the Children	Respondents
< 11 years	12
11-15 years	62
16-18 years	5
> 18 years	31

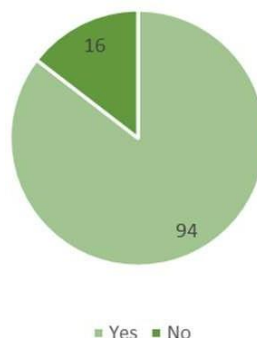
The table above is the demographic data based on the age group of Children (Data provided by the parent respondents).

### Descriptive Analysis



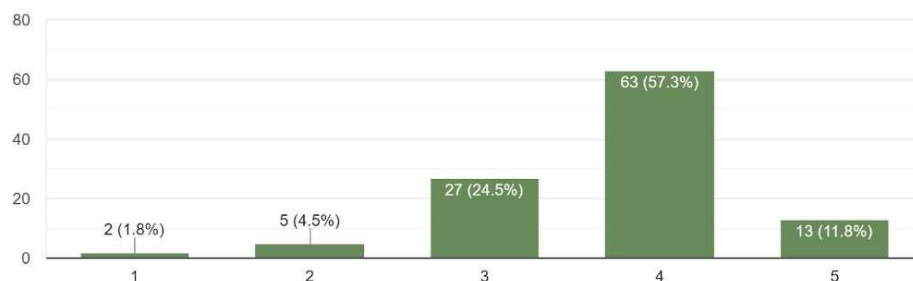
**Figure 1.** Parents With At Least One Shot Of The COVID-19 Vaccine

For the question "Have you received at least one shot of the COVID-19 vaccine?" The diagram reveals that 102 parent respondents have received at least one shot of the COVID-19 vaccine, and 8 parent respondents are not yet vaccinated against COVID-19.



**Figure 2.** Any Side Effects on Parents After COVID-19 Vaccination

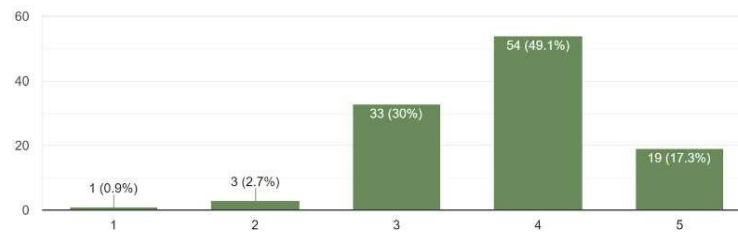
For the question "Have you experienced any side effects after receiving the COVID-19 vaccine?" The diagram reveals that 94 parent respondents have not experienced any side effects from the COVID-19 vaccine, and 16 parent respondents have experienced side effects from the COVID-19 vaccine.



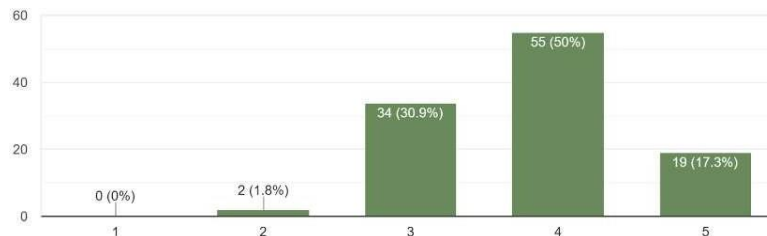
**Figure 3.** Rating a Child's Immunity Against Any Flu

For the question "How would you rate your child's immunity against any flu?" The diagram shows that out of 110 respondents, 63 children, equal to 57.3% of total respondents, rated their child's immunity as 4 on a scale of 5. While 27 respondents, 24.5% of total respondents rated their child's immunity as 3 on a scale of 5. Thus we can conclude that maximum respondents gave an average rating to their child's immunity.



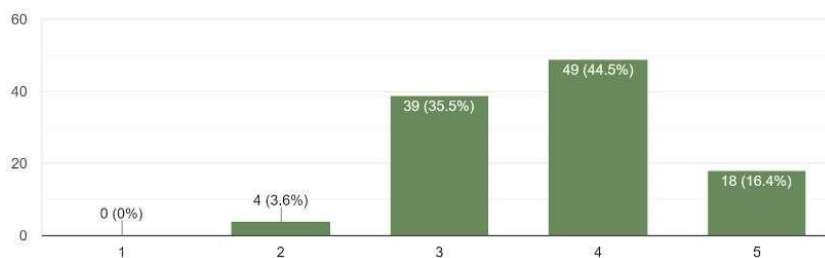


**Figure 4.** Rating The Factor "Quality Clinical Trials" Determines Vaccines' Safety And Efficacy



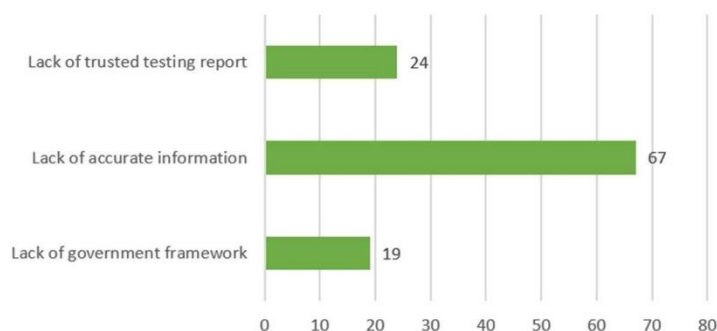
**Figure 5.** Rating The Factor "Long-Term Effects" Determines Vaccine Safety And Efficacy

For the question "Rate how these factors determine vaccines safety and efficacy-Long term effects?" The diagram reveals that out of 110 respondents, 55 respondents, 50% of total respondents rated the factor (Long term effects) 4 on a scale of 5. While 34 respondents, 30.9% of total respondents rated the factor (Long term effects) as 3 on a scale of 5. Thus we can conclude that maximum respondents gave an average rating to Long-term effects to determine vaccines' safety and efficacy.



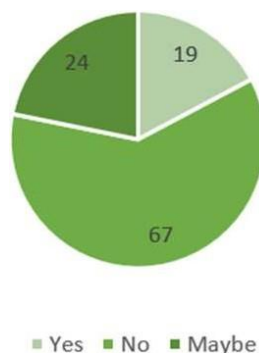
**Figure 6.** Rating the Factor "Trusted Manufacturers" that Determine Vaccines Safety and Efficacy

For the question "Rate how these factors determine vaccines safety and efficacy-Trusted Manufacturers?" The diagram reveals that out of 110 respondents, 49 respondents, 44.5% of total respondents rated the factor (Long term effects) 4 on a scale of 5. While 39 respondents, 35.5% of total respondents rated the factor (Long term effects) as 3 on a scale of 5. Thus we can conclude that maximum respondents gave an average rating to Trusted Manufacturers in order to determine vaccines' safety and efficacy.



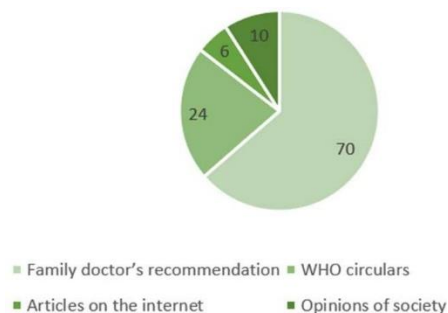
**Figure 7.** Determining the Factors that Could Contribute to COVID-19 Vaccine Hesitancy in Parents

For the question "Which of the following factors contribute to COVID-19 vaccine hesitancy in parents?" The diagram represents that out of 110 respondents, 67 respondents, 60.9% of total respondents feel that parents hesitate to take the COVID-19 vaccine due to a lack of accurate information. While 24 respondents, 21.8% of total respondents, feel that parents hesitate to take the COVID-19 vaccine due to a lack of trust reports. We can also observe that out of 110 respondents, 19 respondents, 17.3% of total respondents feel that parents hesitate to take the COVID-19 vaccine due to a lack of government framework. Thus we can conclude that maximum respondents feel that lack of accurate information is a major factor in vaccine hesitancy in parents.



**Figure 8.** Determining Whether High Pricing and Lack of Availability for COVID-19 Vaccine, Contribute to Vaccine Hesitancy Among Parents

For the question "Do you feel high pricing and lack of availability for the COVID-19 vaccine may contribute to vaccine hesitancy among parents?" The diagram represents that out of 110 respondents, 57 respondents, 51.8% of total respondents are not sure whether high pricing and lack of availability for the COVID-19 vaccine create hesitancy among parents. While 43 respondents, 39.1% of total respondents feel that due to high pricing and lack of availability for the COVID-19 vaccine create hesitancy among parents. On the other hand, 10 respondents out of 110, only 9.1% of total respondents think that high pricing and lack of availability for the COVID-19 vaccine is not a reason for hesitancy among parents. Thus, we can conclude that most parents are unsure whether high pricing and lack of availability for the COVID-19 vaccine create hesitancy.

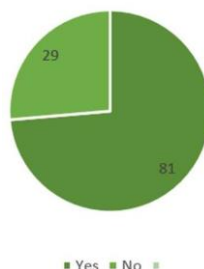


**Figure 9.** Determining Reliable Sources of Information While Getting Your Child Vaccinated Against COVID-19



**Figure 10.** Understanding the Urge or Need to Receive Additional Information About Covid-19 Vaccination for Children

For the question "Do you feel the need to receive additional information about COVID-19 vaccination for children?" The diagram represents that out of 110 respondents, 95 respondents, 86.4% of total respondents feel that there is a need to receive additional information about the vaccination. While 15 respondents, 13.6% of total respondents, feel that there is no need to receive additional information. Thus, we can conclude that maximum parents need additional information about COVID-19 vaccination.



**Figure 11.** Determining The Willingness of Parents to Vaccinate Their Children Against COVID-19

For the question "Are you willing to vaccinate your children against COVID-19?" The diagram represents that out of 110 respondents, 81 respondents, 73.6% of total respondents are willing to vaccinate their children. While 29 respondents, 26.4% of total respondents are willing to vaccinate their children. Thus, we can conclude that maximum parents are willing to vaccinate their children against COVID-19.

### Hypothesis

We used IBM SPSS version 22 in Hypothesis I to find the factors that influence the acceptance and generate hesitancy toward COVID-19 vaccines for children.

H0: Parents believe their child's immunity is insufficient to combat covid.

H1: Parents believe their child's immunity is sufficient to combat covid.

**Table 2.** Group Statistic

	Willingness to Vaccinate child	N	Mean	Std. Deviation	Std. Error Mean
Child immunity against any flu	1	81	3.70	.843	.094
	0	29	3.79	.675	.125

**Table 3.** Independent Samples Test

		Lavene's test for equality of variances		t-test equality of means						
		f	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% of the confidence interval of the difference	
									Lower	Upper
Child immunity against any flu	Equal variances assumed	3.061	.083	-.514	108	.608	-.089	.174	-.434	.255
	Equal variances not assumed			-.571	61.329	.570	-.089	.156	-.402	.224

### Interpretation

Since the Significance value (0.083) is  $> 0.05$ , we will accept H0 and reject H1 (see table 3). Parents believe their child's immunity is not sufficient to combat covid, so they are willing to vaccinate their child against COVID-19. Here, we can interpret that since the child has an average immunity of 3.7 out of 5, the parents are willing to vaccinate their children against COVID-19 (see table 2).

The table below shows data related to whether the vaccinated parents need additional information before vaccinating their children.

H0: Parents who are vaccinated are still not satisfied with the available information about COVID-19 vaccination for their child

H1: Parents who are vaccinated are still satisfied with the available information about COVID-19 vaccination for their child

**Table 4.** Group Statistic

	Needs for additional information	N	Mean	Std. Deviation	Std. Error Mean
Vaccinated parents	1	95	.93	.263	.027
	0	15	.93	.258	.067

**Table 5.** Independent Samples Test

		Lavene's test for equality of variances		t-test equality of means						
		f	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% of the confidence interval of the difference	
									Lower	Upper

Vaccinated parents	Equal variances assumed	.038	.847	-.096	108	.923	-.007	.073	-.151	.137
	Equal variances not assumed			-.098	18.873	.923	-.007	.072	-.158	.144

### **Interpretation**

Since the Significance value (0.847) is > 0.05, we will accept HO and reject H1 (see table 5). Parents who are vaccinated are still not satisfied with the available information, so they wish to seek additional information about COVID-19 vaccination for their children. Here, we can interpret that those parents who are vaccinated still need additional information when it comes to getting their children vaccinated.

## **DISCUSSION**

Our study strives to understand the perceptions of parents and society towards Bharat Biotech's Covaxin for children. The objective is to discover if there is any ambiguity or acceptance of vaccines for children in the minds of the general public. We found that a delay in children's vaccination is caused by a lack of information on efficacy and safety evidence related to the vaccine. Therefore, Bharat Biotech should allocate family physicians as the primary advocate for promoting the efficacy of Covaxin for children while spreading accurate information to clear the concerns in parents' minds.

Furthermore, Bharat Biotech can promote effective strategies for communication intervention to generalize the acceptance of vaccines among the public. Bharat Biotech can provide an AI-powered platform connecting parents with healthcare officials to combat the information deficit obstacle. Also, websites can be predominately used to spread correct information about the vaccine in multilingual languages.

Escalating vaccine literacy on multiple technology platforms can help remove anti-vaccination content while engaging the public with accurate facts and figures. Moreover, offering a full-time telephonic helpline to provide parental support can address apprehensions or clear skepticism in the parents' minds. Also, a 360-degree feedback system can be used to track and measure the program's success, which can be leveraged to customize implementation models accordingly.

High prices and weak distribution channels can prevent parents from vaccinating their children. Bharat Biotech can collaborate with the government to establish an economical and practical government policy framework for all socioeconomic statuses. Moreover, robust analytics can help Bharat Biotech track any misinformation related to Covaxin, as this will ensure the parent's belief is not misdirected towards apprehension. Consequently, appointing a spokesperson to address the vaccine hesitancy on multimedia can generate community ownership, and community members may build up positive attitudes towards Covaxin. Bharat

Biotech can narrate the vaccination's prominence in the form of storytelling and broadcast it over multi-channels to build trust and confidence in the community. Also, they can create a manual or learning module on Covaxin for children and circulate it around to ensure that the whole society demonstrates a shared optimistic belief about children's vaccination.

## **CONCLUSION**

Children have a low risk for severe or fatal effects from the coronavirus. However, vaccinating children is of utmost importance as they can act as carriers of the disease affecting the whole family's health. Moreover, enjoying physical activities at school contributes to a child's mental well-being, highlighting the priority of vaccination. Furthermore, children's health can be protected with improvised immunity to avoid any complications and hospitalization due to COVID-19. As a result, parents have become conscious of exploring the decision to vaccinate their children and subconsciously rely on societal attitudes.

Bharat Biotech can leverage this opportunity to bring down all the factors that contribute to vaccine hesitancy among parents and enhance the overall acceptability of Covaxin. Safety and efficacy are the critical contributors that define the acceptance of any vaccine. Therefore, this research study has looked upon influencing factors such as Clinical Trials, Trusted Manufacturers, Long term effects that generate hesitancy toward COVID-19 vaccines for children.

The survey highlights the willingness of parents to vaccinate their children with moderate immunity. Therefore, the child's immunity can influence the parent's attitude towards Covaxin. Moreover, even if the parents have received at least one vaccine dose, they feel it's essential to gain more information from Bharat Biotech to address their concerns on children's immunity building through Covaxin. Some parents may be hesitant toward their child's vaccination based on the side effects they must have experienced during their time. Therefore, Bharat Biotech has to literate everyone on the reasons behind such side effects in adults and make them understand that the adult immunity system varies drastically from that of a child's immunity.

We asked the parent respondents to provide ratings from least to most influential factors to learn the perceived safety, immunity, and efficacy beliefs on Covaxin for children. The results showcase that "Quality Clinical Trials" are the most compelling factor that will help make informed decisions regarding their child vaccination. This was followed by "Long Term Effects" and "Trusted Manufacturers."

Lack of accurate information is the major contributor to negative perceptions of parents and society towards Bharat Biotech's Covaxin for children. Also, high pricing and lack of availability of COVID-19 vaccine contribute to vaccine reluctance among parents. Our research study shows that a maximum of parents' respondents are willing to vaccinate their children, however there is a huge necessity to receive additional authentic information about COVID-19 vaccination for children. We also discovered that "Family Physicians" are the most reliable sources for any communication regarding their child's immunization. Therefore, Bharat Biotech must define physicians looking after a whole community as their stakeholders to spread accurate factual information on the safety and efficacy of Covaxin to reinforce optimistic attitudes in parents' minds and society as a whole.

The COVID-19 pandemic has underlined the germination and importance of biotechnology companies worldwide. These companies have acted as a miracle for millions of people by providing vaccination to combat the coronavirus pandemic. The emergence and development of vaccines have led to a massive rise in the spread of misleading information on various media. The fear in the public mind is misused to generate disinclination toward clinical trials by the company. Moreover, this can harm the company's overall reputation and develop rebellion against life-saving vaccines. Therefore, we suggest that future researchers perform a holistic research study on developing strategies for biotech companies to deal with misinformation related to clinical trials of vaccines. Also, future researchers can do a survey that includes follow-up with the parents who have vaccinated their children. This will help them learn if there is any change in the parents' perceptions and attitudes before and after their child's vaccination.

### **LIMITATIONS**

In any research paper, the limitations don't only signify potential errors but rather help the reader to understand under what conditions or environment the report needs to be interpreted for the best learning experience. Our research study identified that only the parents with mobile and internet could provide their perceptions and attitudes towards vaccination for children against COVID-19. The survey can be called partially skewed as we cannot discover the real motives of the parent respondents due to no face-to-face physical interactions as we circulated an online Google Form to collect data for our survey. Also, we couldn't gain an understanding of parents' perspectives and attitudes who are not technologically literate. Moreover, the Google form offers only limited customization, so we couldn't include many enhancing features to make the survey form more appealing.

Furthermore, the respondents need to have a Google account to access Google Forms. Therefore, some parent respondents refused to fill out our survey form without a Google account. As a result, we did extra work asking the parent respondents about their presence on the Google account before circulating the questionnaire to them. With this, future researchers can understand that importance needs to be given to selecting digital platforms to conduct an online survey as it could save time. Moreover, the study can be unskewed if we also consider taking responses from those who are not digitally literate, as their perspective can play a significant role in deriving outcomes.

### **ACKNOWLEDGEMENT**

With immense pleasure, we are privileged to present our research project entitled "A Study to Understand Parents' Perceptions and Societal Attitudes on Bharat Biotech's Covaxin for Children." We are grateful to our mentors, Rajesh Kumar Nair, Professor of SIES SBS, and Majdi Quttainah, Professor Kuwait University, for their invaluable guidance, constructive criticism, and unwavering enthusiasm throughout the research and writing of the manuscript, which led to the successful completion of this work. We express our heartiest gratitude to Dr Liem Gai Sin for his support and encouragement while doing the project. We sincerely thank all the parents for their valuable feedback and views that helped us collect authentic data for the research. Last but not least, our special thanks to our batchmates for their support and constant encouragement during the project work.

## **DECLARATION OF CONFLICTING INTERESTS**

There are no potential conflicts of interest for the authors to disclose.

There are no financial interests to record, and all co-authors have seen and agreed with the contents of the work. We certify that the submission is unique and that it is not currently under consideration by another publisher.

## **REFERENCES**

- Bharat Biotech. (2021). Study demonstrates robust safety and immunogenicity in 2-18 Volunteers. Retrieved from <https://www.bharatbiotech.com/images/press/covaxin-for-children-study-press-release.pdf>
- Babicki, M., Pokorna-Kalwak, D., Doniec, Z., & Mastalerz-Migas, A. (2021). Attitudes of parents with regard to vaccination of children against COVID-19 in Poland. A nationwide online survey. *Vaccines*, 9(10), 1192. doi: 10.3390/vaccines9101192
- Dutta, T., Agle, J., Meyerson, B. E., Barnes, P. A., Sherwood-Laughlin, C., & Nicholson-Crotty, J. (2021). Perceived enablers and barriers of community engagement for vaccination in India: Using socioecological analysis. *PLoS ONE* 16(6), e0253318. doi: 10.1371/journal.pone.0253318
- El-Elmat, T., AbuAlSamen, M. M., Almomani, B. A., Al-Sawalha, N. A., & Alali, F. Q. (2021). Acceptance and attitudes toward COVID-19 vaccines: A cross-sectional study from Jordan. *PLoS ONE* 16(4), e0250555. doi: 10.1371/journal.pone.0250555
- FDA. (2021). FDA authorizes Pfizer-BioNTech COVID-19 vaccine for emergency use in children 5 through 11 years of age. Retrieved from <https://www.fda.gov/news-events/press-announcements/fda-authorizes-pfizer-biontech-covid-19-vaccine-emergency-use-children-5-through-11-years-age>
- Kostoff, R. N., Calina, D., Kanduc, D., Briggs, M. B., Vlachoyiannopoulos, P., Svistunov, A. A., & Tsatsakis, A. (2021). Retracted: Why are we vaccinating children against COVID-19? *Toxicology Reports*, 8, 1665-1684. doi: 10.1016/j.toxrep.2021.08.010
- Lv, M., Luo, X., Shen, Q., Lei, R., Liu, X., Liu, E., Li, Q., & Chen, Y. (2021). Safety, immunogenicity, and efficacy of COVID-19 vaccines in children and adolescents: A systematic review. *Vaccines*, 9(10), 1102. doi: 10.3390/vaccines9101102
- Mantha, S. (2022). COVID-19 vaccination in children in India: A way forward. Retrieved from [https://probiologists.com/Uploads/Articles/11\\_637781690335739309.pdf](https://probiologists.com/Uploads/Articles/11_637781690335739309.pdf)
- McKee, C., & Bohannon, K. (2016). Exploring the reasons behind parental refusal of vaccines. *The Journal of Pediatric Pharmacology and Therapeutics*, 21(2), 104–109. doi: 10.5863/1551-6776-21.2.104
- Mc Elfish, P. A., Willis, D. E., Shah, S. K., Reece, S., Andersen, J. A., Schootman, M., ..., & Warmack, T. S. (2022). Parents' and Guardians' Intentions to Vaccinate Children against COVID-19. *Vaccines*, 10, 361. doi: 10.3390/vaccines10030361
- Morgan, L., Schwartz, J., & Sisti, D. (2021). COVID-19 vaccination of minors without parental consent. *JAMA Pediatr*, 175(10), 995-996. doi: 10.1001/jamapediatrics.2021.1855
- Nair, R. K., V, R. P., Azlan, S. H., Kee, D. M. H., Sazali, S. A., Rahmat, S. N. ..., Ingole, T. (2022). Marketing strategies implemented by hotel industry during COVID-19 in Malaysia. *International Journal of Tourism and Hospitality in Asia Pacific*, 5(1), 100-111. doi: 10.32535/ijthap.v5i1.1405
- Narayan, V. (2021). COVID vaccination for children in India: A step towards better



- health, wellbeing and development. *The Indian Practitioner*, 74(12), 7-10.
- Temsah, M. H., Alhuzaimi, A. N., Aljamaan, F., Bahkali, F., Al-Eyadhy, A., Alrabiaah, A., Alhaboob, A., ... Alhasan, K. (2021). Parental attitudes and hesitancy about COVID-19 vs. routine childhood vaccinations: A national survey. *Frontiers in public health*, 9, 752323. doi: 10.3389/fpubh.2021.752323
- Vannice, K. S., Salmon, D. A., Shui, I., Omer, S. B., Kissner, J., Edwards, K. M., Sparks, R., ..., & Gust, D. A. (2011). Attitudes and beliefs of parents concerned about vaccines: impact of timing of immunization information. *Pediatrics*, 127(1), S120–S126. doi: 10.1542/peds.2010-1722R