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Research Article

Analysis on the Acceptance of COVID-19 Vaccine Administration for Children in Indonesia Based on the Theory of Planned Behavior

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ABSTRACT

The administration of COVID-19 vaccine in children aims to control the spread of this disease in Indonesia. Parents make the decision whether to vaccinate their children against COVID-19 or not. This study was conducted to analyze parents' acceptance of the COVID-19 vaccination for children in Indonesia based on the Theory Planned Behavior (TPB). The research design used a cross-sectional survey involving 400 parents of children aged 6-11 years in Indonesia in 34 provinces. Samples were purposively selected based on inclusion criteria: parents are older than 18 years, parents of children aged 6-11 years and live in Indonesia. The exclusion criteria were parents of children who recovered from COVID-19 less than 3 months and children with COVID-19 contraindications. The chi-squared test was conducted to determine the correlation between parents' acceptance and TPB constructs that include attitudes, subjective norms and behavioral control. A multivariate logistic regression analysis was employed to analyze the TPB construct with the largest contribution on parents' acceptance of the COVID-19 vaccination. The results showed high acceptance toward COVID-19 vaccination for children aged 6-11 years (98.5%). Positive subjective norms and positive behavioral control also contributed to the parental acceptance of the COVID-19 vaccine for children in Indonesia (p-value = 0.000), in which subjective norms had the largest influence (sig. 0.096 value with Exp B value of 6.203). TPB is a useful framework in developing proper interventions to raise the vaccination acceptance of parents in Indonesia.

INTRODUCTION

Severe Acute Respiratory Syndrome-2 (SARS-Cov-2) is the source of the infection now known as Coronavirus Disease 2019 (COVID-19), which was initially discovered in China. In Indonesia, COVID-19 was first reported in March 2019. A year after, on March 11th, 2020, the World Health Organization (WHO) officially declared COVID-19 as a global pandemic (WHO, 2022) Vaccination has been a prominent effort to control the spread of COVID-19. The Ministry of Home Affairs made a regulation and gave specific instructions written in regulation number 66 of 2021, encouraging the vaccination of children

aged 6 to 11 years, provided that the coverage target has reached a minimum of 70% of the first dose of the total target (Kemendagri, 2022). Vaccines have advanced significantly in the fight against the COVID-19 pandemic, and the use of vaccinations for children has become one of the most debated issues surrounding efforts to prevent further transmission (Ioannidis, 2021). COVID-19 vaccination reduces the morbidity and mortality rates and it minimizes the transmission and builds herd immunity (Kemenkes, 2021). Vaccinations help to obstruct the contagion's spread, and can keep people economically and socially productive (Lidia and Widayati, 2021). The availability of vaccines prepared by the government does not necessarily make everyone want to be vaccinated; various reasons arise regarding concerns from religious, or political views and even health reasons (Azizah *et al*., 2022). However, vaccinations remain a controversy. It requires proper identification and effective handling of the hindering factors to be able to fully implement the vaccinations (Chellaiyan, 2022). Although children tend to experience milder symptoms of the disease with lower mortality than adults, they play a significant role in the spread of disease as asymptomatic carriers (Ashraf *et al*., 2021).

On February 5th, 2022, Indonesia set a national vaccination target of 208,265,720 shots, with the first dose vaccination given to 89.50% of the target. However, the first dose COVID-19 vaccination among children aged 6-11 years with 26,400,300 vaccination targets was still low (61%). One study found that 50 mothers (37%) still doubted the safety of the COVID-19 vaccine and could not accept to vaccinate their children (Chellaiyan, 2022). Parental acceptance of the COVID-19 vaccine may play an important role in successfully establishing herd immunity (Xu, 2021)

The behavioral theories can be employed to better understand parents' reception of the COVID-19 vaccine for their children, including the Theory of Planned Behavior (TPB). The use of TPB in this field of study is still very limited. One recent epidemiological study used this theory in research conducted in China (Zhang *et al*., 2020).

The exploration of constructs in behavioral theory that significantly influence COVID-19 vaccination success can be used as an insight to make intervention plans that aim to increase the vaccination acceptance (Wong *et al*., 2020). Research on parents' attitudes regarding the COVID-19 vaccination for children has never been conducted in Indonesia. Accordingly, this study aimed to conduct research concerning parents' acceptance towards COVID-19 vaccination for their children in Indonesia based on the TPB.

METHODS

This descriptive-analytic study was conducted with a cross-sectional survey design. Variables were observed simultaneously, where each subject was measured once. The cross-sectional design was used to determine the relationship among attitude, subjective norms, behavioral control on the approval of COVID-19 vaccination in 34 provinces as presented in Figure 1.



Figure 1. The Map of Indonesia.

The national vaccination target for children aged 6-11 years in Indonesia was 26,400,300 (Data Source: https://vacsin.kemkes.go.id/#/vaccines, accessed February 5, 2022). The samples were 400 respondents, which sampling size was calculated using the Slovin's formula with the degree of freedom of 5%.

$$n = \frac{N}{(1 + Ne)} = \frac{26{,}400{,}300}{(1 + (26{,}400{,}300 x 5\%^{2}))}$$

$$n = \frac{26{,}400{,}300}{(1 + (26{,}400{,}300\ x\ 0.05^{2}))}$$

$$n = \frac{26{,}400{,}300}{25{,}698{,}735} = 399.98 = 400$$

n:sample size
N : population size
Ne: tolerable margin of error

Sampling was done purposively based on the inclusion criteria: a) parents aged older than 18 years b) children aged 6-11 years c) domiciled in Indonesia. The exclusion criteria included: a) COVID-19 children's survivors of less than 3-month recovery, and b) children with COVID-19 contraindications.

A questionnaire adjusted to fit the population's needs from numerous reports and tested for validity and reliability was used to collect the

data. Everyone could access the questionnaire at https://bit.ly/COVID-19 TPB UNBL. Question items consisting of unfavorable and favorable statements were developed in a 5-point Likert scale. There were 5 statements on the Attitude construct variable with scores ranged from 5-25, the subjective norm construct and behavioral control were measured in 1 statement for each. There were 6 statements on the vaccination acceptance, with the scores ranging from 6-30.

Table 1. Data on the Distribution of Respondents in Every Province

Province	Number	Percentage (%) (n=400)
Java		
SR of Yogyakarta	10	2.5
SR of Jakarta	24	6
West Java	21	5.25
Central Java	18	4.5
East Java	14	3.5
Banten	5	1.25
Kalimantan		
West Kalimantan	2	0.5
South Kalimantan	52	13
Central Kalimantan	21	5.25
East Kalimantan	7	1.75
North Kalimantan	4	1
Sumatera		
Aceh	31	7.75
West Sumatera	6	1.5
South Sumatera	4	1
North Sumatera	5	1.25
Riau	8	2
Riau Islands	4	1
Jambi	11	2.75
Bengkulu	4	1
Lampung	10	2.5
Sulawesi		
Gorontalo	8	2
West Sulawesi	4	1
South Sulawesi	20	5
Central Sulawesi	2	0.5
Southeast Sulawesi	6	1.5
North Sulawesi	7	1.75
Nusa Tenggara, Maluku and Papua		
Maluku	12	3
North Maluku	7	1.75
Bangka Belitung	11	2.75
West Nusa Tenggara	9	2.25
East Nusa Tenggara	19	4.75
Bali	9	2.25
Papua	13	3.25
West Papua	12	3
Total	400	100.0

Source: Primary Data 2022

Table 2. The Frequency Distribution of Respondents' Socio-Demographic Data

Category	Frequency	Percentage (%) (n= 400)
Parents' Age		
19-30 years old	129	32.3
31-40 years old	169	42.3
41-50 years old	88	22.0
>50 years old	14	3.5
Parental Relationship		
Father	186	46.5
Mother	214	53.5
Marital Status		
Divorced	22	5.5
Widow/Widower (spouse died)	13	3.3
Married	365	91.3
Number of Children		
One	144	36.0
Two	139	34.8
>2	117	29.3
Age of Children		
6 years old	116	29.0
7 years old	69	17.3
8 years old	53	13.3
9 years old	55	13.8
10 years old	47	11.8
11 years old	60	15.0
Latest Education		
Elementary	22	5.5
Junior High	20	5.0
Senior High	142	35.5
Higher Education	216	54.0
Occupation		
Housewife	58	14.5
Entrepreneur	94	23.5
Private Employees	126	31.5
Retired	3	0.8
Civil Servant	84	21.0
Others	35	8.8
Employment Sector		
Non-health sector	332	83.0
Health sector	68	17.0
Monthly Income		
1,000,000,- IDR	63	15.8
1,000,000,- IDR to 3,000,000,- IDR	167	41.8
3,000,000,- IDR to 5,000,000,- IDR	115	28.7
> 5,000,000,- IDR	55	13.8
Main Source of COVID 19 Information		
Social media	264	66.0
TV or radio	59	14.8
Health Care Provider	57	14.2
Colleagues or Family	13	3.3
Others	7	1.8
Total	400	100.0

Source: Primary Data 2022

RESULTS AND DISCUSSION

The Distribution of Respondents' Data

The distribution of respondents in this research is presented in Table 1. Based on the distribution data of the 400 respondents from Indonesian people, there are representatives of respondents from each province in Indonesia.

Socio-Demographic Data

The data on the analysis of socio-demographic frequency distribution are presented in Table 2, which shows the majority of the parents aged between 31- 40 years (42.3%). The ratio between father and mother is 1:1 (46.5% father; 53.5% mother). As many as 91.3% of the respondents are married and 36.0 % of them have one child, and most of their children are aged 6 years (29.0%). More than half of the respondents are university graduates (54.0%), and almost 31.5% of them work in private sector, while only 17.0% of them are health workers. Seen from their income, 41.8% of them make between 1,000,000, - to 3,000,000, - IDR. Most of the respondents (66.0%) accessed information regarding COVID-19 from social media.

The overview of COVID-19 vaccination acceptance for children aged 6-11 years

The data on the distribution of COVID-19 vaccines for children are shown in Table 3. Results of the study stated that most of the respondents (98.5%) approved the COVID-19 vaccination for children in Indonesia. These results indicate a high desire to vaccinate their children against COVID-19 because parents believe that vaccination minimizes disease transmission and builds herd immunity opposed to COVID-19. Most of participants (85%) stated accepting the COVID-19 vaccine for their children (Mohan *et al*., 2020).

More than 80% of parents agree that the COVID-19 epidemic can be stopped by making immunization mandatory for children. In the study conducted by Alamliki *et al*. (2022), although the COVID-19 vaccine had been approved to be immunized for children aged 5-11 years, the doubts of their parents were greater than the parents of children aged less than 18 years, which can affect the success of government efforts to tackle the pandemic.

For the successful implementation of the COVID-19 vaccine in Indonesia, the public must first be informed about the vaccine so that the level of public perception and acceptance is relatively high (Arumsari *et al*., 2021).

Table 3. Parents' Acceptance towards COVID-19 Vaccination for Children in Indonesia

Category	Frequency	Percentage (%) (n= 400)
Rejection	6	1.5
Acceptance	394	98.5
Total	**400**	**100.0**

Source: Primary Data 2022

Table 4. The Distribution of Attitude, Subjective Norms, and Behavior Control

Category	Frequency	Percentage (%) (n =400)
Attitude		
Negative	41	10,3
Positive	359	89.8
Subjective Norms		
Negative	25	6.3
Positive	375	93.8
Behavioral Control		
Negative	26	6.5
Positive	374	93.5
Total	**400**	**100.0**

Source: Primary Data 2022

Table 5. The relationship between attitude and the acceptance of COVID-19 vaccination for children in Indonesia

Vaccine Acceptance	Attitude (n =400) in %		*p*-value
	Negative	Positive	
Reject	0.3%	1.3%	0.602
Accept	10.0%	88.5%	

Source: Primary Data 2022.

General Data on the Acceptance, Subjective Norms and Behavior Control

Distribution data of attitude, subjective norms, and behavior control are shown in Table 4. The result findings stated that most parents had a positive attitude and acceptance towards COVID-19 vaccination for their children (89.8%). Based on subjective norms, parental acceptance reached 93.8% and the one of behavioral control was also 93.5% positive.

Putri (2018) defined attitude as either positive or negative responses towards a particular event, object or person. Individuals will show certain behaviors that reflect their positive attitudes. Ajzen (1991) explained that behavioral control is considered apart from subjective attitudes and norms. Behavioral control is perceived as the ability to perform an action. TPB explains that a person's behavior arises out of their intention.

The results of bivariate analysis on attitude, subjective norms, and behavior control on the acceptance towards COVID-19 vaccination for children in Indonesia

Analysis on attitudes, subjective norms, and behavioral controls on approval of COVID-19 vaccination in children in Indonesia is shown in Table 5. The findings of the Chi-squared test used to analyze the link between attitudes and the acceptability of the COVID-19 vaccine for children in Indonesia show a significant *p*-value of 0.602, *p* value of 0.05. Therefore, it implies that there is correlation between attitudes and the acceptability of COVID-19 vaccination in children (Table 6).

One study found that an attitude is not instantly put into action. It takes the supports of other factors to make it happen (Notoatmodjo, 2014). Thus, parents' frame of mind towards COVID-19 vaccination for children is still influenced by other family members and other sources of COVID-19 information that they can easily access on social media. Such behavior then affects parents' decision making. One research attempted to develop the trust related to vaccine supply adequacy which can be a useful strategy (Zhang, 2020).

The analysis of the relationship between subjective norms and the acceptance towards COVID-19 vaccination for children in Indonesia is shown in Table 6. According to recent research, subjective norms are influenced by normative beliefs among the community including parents, relatives, friends, and neighbors. Their beliefs then construct either positive or negative attitudes (Amin, 2021).

Table 6 shows a significance value of *p*-value of 0.000, $p < 0.05$, which indicates the relationship between subjective norms and COVID-19 vaccination acceptance is confirmed.

Recent research found that subjective norms are social enforcement to influence an individual to engage or not engage in certain behaviors that are considered necessary regarding support or rejection of a behavior (Azizah *et al*., 2022).

Family support is essential in deciding whether or not to vaccinate children since it has the power to alter behavior. Moreover, 50% of participants confirmed their family would approve of their child getting the COVID-19 vaccine (Zhang, 2020). Another factor that affects vaccine acceptance is the media. Media is a process of presenting information as a communication channel to gain knowledge (Cahyono, 2016)

The results of a recent study (Amin, 2021) show a significant relationship between subjective norms and the intention to take COVID-19 vaccination ($p = 0.001$). A person who is exposed to positive subjective norms regarding COVID-19 vaccination tend to have strong self-motivation to take the COVID-19 vaccination. Correlation analysis between behavior control and acceptance of COVID-19 vaccination in children in Indonesia is presented in Table 7. Referring to TPB, behavioral control is influenced by a person's perception of their own ability. This perception is based on the easiness and difficulties to apply certain behavior. If someone has strong behavioral control over their

attitude, the person will have a positive perception to control the behavior. On the other hand, if the control of behavior is stronger on factors that can inhibit the behavior, negative perception regarding behavioral control will arise (Amin, 2021).

Table 6 displays the findings of the Chi-squared test analysis of the correlation behavioral control with the acceptability of COVID-19 immunization for children in Indonesia. As can be observed in the Table, the significant value is 0.000 (p value <0.05), demonstrating a connection between behavioral control and the desire to vaccinate children to prevent COVID-19.

Parents know that getting the COVID-19 vaccine will be relatively simple and straightforward. Their trust may enable them to embrace the COVID-19 immunization for children when they consent to have their children immunized**.**

The Results of Multivariate Analysis on the Attitude, Subjective Norms, and Behavioral Control

Multivariate analysis revealed that subjective norms have the strongest influence on parents' acceptance towards COVID-19 vaccination for children in Indonesia with a significance value of 0.096. The Exp B value for subjective norms is 6.203, implying that respondents who received supports from their families have 6.371 higher opportunity to get their children vaccinated.

In research conducted by (Ashar *et al*., 2022), respondents' anxiety is a problem that often occurs. One of the causes of anxiety is the circulation of hoax information that creates a negative reaction to the COVID-19 vaccine. It was emphasized by (Zhang, 2020) that the future health promotion should focus on increasing parents' knowledge about COVID-19 vaccination and encouraging them to discuss their motive for their children to be vaccinated with other family members to gain positive supports. More specific information for parents about vaccination practices during a pandemic is still essential to maintain the coverage of child vaccination (Sinuraya *et al*., 299). The role of parents is also very effective in providing information to their families so increased knowledge leads to increased perceptions of the COVID-19 vaccine (Liaumin and Khalza, 2021). One study mentioned that a person who receives exposure to positive subjective norms for COVID-19 vaccination is likely to have stronger self-motivation to get vaccinated for COVID-19 (Amin, 2021). Parental indecision centers around vaccine safety and side effects (Kwok, 2022). On the other hand, more exposure to negative subjective norms regarding COVID-19 vaccination leads to lower intention and motivation to get vaccinated for COVID-19. Another study stated that the vaccine clinical trial process and its temporary safety affect a person's acceptance of the vaccine (Kalza, 2022). The reliability of vaccine providers is considered essential, and many have stated that they are willing to accept vaccines if Indonesian pharmaceutical companies produce them because it is related to climatic conditions.

Table 6. The relationship between subjective norms and the acceptance of COVID-19 vaccination for children in Indonesia

Vaccine Acceptance	Subjective Norms (n =400) in %		*p*-value
	Negative	Positive	
Reject	0.8%	0.8%	0.000
Accept	5.5%	93.0%	

Source: Primary Data 2022.

Table 7. The relationship between behavioral control and the acceptance of COVID-19 vaccination for children in Indonesia

Vaccine Acceptance	Behavioral Control (n =400) in %		*p*-value
	Negative	Positive	
Reject	0.8%	0.8%	0.000
Accept	5.8%	92.8%	

Source: Primary Data 2022.

The TPB construct is able to explain the approval towards children's vaccination against COVID-19 by 87.3% as shown by the Nagelkerke R square value of 0.873. The remaining 12.7% can be explained by variables that are not included in this study. Accordingly, considering the public safety concerns, COVID-19 vaccination status should be used as a requirement for face-to-face schooling.

CONCLUSIONS

Parents' acceptance of children vaccination of COVID-19 vaccination for age group 6-11 years is high in Indonesia.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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