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Factors Associated with Parental Intention to Vaccinate Their Primary School-Aged Children in Indonesia

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ABSTRACT

Along with the consistent increase in the COVID-19 vaccination rate, the Indonesian government continues to strive to control the pandemic with various policy programmes. On the other hand, the vaccination programme has also been expanded to 6-11 years school children to foster the implementation of school reopening despite many debates and controversies circulated in the country. Identifying parental health beliefs toward vaccination, this study aims to examine factors influencing parental intention to vaccinate their children. An online survey was conducted to attain responses from 400 study participants from 9 selected provinces. The data were analysed using descriptive and inferential statistical techniques on the SPSS version 26. This study revealed that vaccination acceptance is high among parents in Indonesia. Parents' intention to vaccinate their children was significantly influenced by health beliefs. The multiple regression analysis suggested perceived susceptibility ($\beta = .146$, $p = .012$), perceived benefits ($\beta = .249$, $p = .000$) and cues to action ($\beta = .220$, $p = .000$) as significant predictors which positively influenced the vaccination intention, while the perceived barrier ($\beta = -.316$, $p = .000$) was identified as a negative predictor of the dependent variable in the model. There was a significant mean difference in parental intention within gender, age group, and household income. The findings of this study emphasised the need to provide a more strategic health messaging and health education programme to address the issues surrounding the barriers to implementing vaccination for children in Indonesia.

Keywords: *COVID-19, vaccine acceptance, health belief model, school children, Indonesia.*

INTRODUCTION

Public acceptance and willingness to be vaccinated is a country's big capital in handling the COVID-19 pandemic. Several factors were linked to the willingness to take vaccines such as knowledge, beliefs, individual preferences, the availability of vaccine options, and the availability of clear and reliable information. Although many were hesitant to be vaccinated at the very beginning of vaccine administration, vaccination has been proven to be the most effective measure in reducing the global spread of COVID-19. To date, 70.5% of the global population has been vaccinated (Holder, 2022). However, the anti-vaccine movement, misinformation related to vaccines, and doubts about vaccines remain as major challenges for the government in achieving the objective of the national vaccination plan (Widiartanto et al., 2021). Yong et al. (2022) through their mathematical model synthesised key strategies to bring Indonesia from the pandemic to the new normal. These include increasing the vaccination rate and vaccine efficacy, and implementing disciplined social restrictions.

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When the COVID-19 vaccine was first introduced, a study on public acceptance of the COVID-19 vaccine involving European countries showed that most national vaccine acceptance rates were below the estimated threshold required for the immunity group (Lindholt et al., 2021). The acceptability of the COVID-19 vaccine and its predictors in addition to attitudes towards the vaccine among the Jordan population showed that public acceptance is very low, which was only 37.4% (El-Elimat et al., 2021). Investigations in the Global South consistently found that the acceptance of the COVID-19 vaccine is much higher in low-income countries, compared to the United States and Russia (Geddes, 2021). Younger and healthier residents in the State of California were less likely to receive the vaccine than the older and medically susceptible population (Chin et al., 2021). While a study in Malaysia revealed a high willingness for vaccination among the studied population although much of their knowledge about the COVID-19 vaccine is not insufficient (Mohamed et al., 2021).

As one of the countries with the highest incidence of infection and mortality due to COVID-19 in Southeast Asia (Ophinni et al., 2020; Tri Sakti et al., 2021), Indonesia is also implementing vaccination as one of the protective measures in stopping the pandemic. However, many concerns related to its safety, effectiveness, and implications are still a matter of debate in the country despite the government's tremendous success in providing the vaccine from multiple modalities within a very short time (Ophinni et al., 2020). Although factors influencing the worse COVID-19 situation in Indonesia have been properly documented (i.e., the quality and quantity of testing and screening, vaccination programmes, and restriction policies), the COVID-19 vaccination coverage in Indonesia is still lower compared to neighbouring countries (Lubis et al., 2022).

Apart from the vaccination polemic in Indonesia, the government continues to strive to control the pandemic with various policy programmes and has succeeded in gaining world recognition (Kholisdinuka, 2021; Luthfan, 2021). The government's consistent efforts in socialising COVID-19 policies managed to increase public awareness of this pandemic (Prayoga, 2020). The progress of COVID-19 vaccination has now reached 72.80% of the population receiving the first dose of vaccination, 51.41% have received the second dose of vaccination, and the booster dose has reached 1,288,890 population (Reuters, 2022). There are two types of COVID-19 vaccination programmes carried out, which are government vaccination programme that is given to health workers, public officials, the elderly, the general public, and youth, and mutual cooperation vaccination programme which targets employees and their families (Supriatin, 2021). On the other hand, the vaccination programme has also been expanded to 6-11 years school children to foster the implementation of school reopening.

Like other countries in the world, the pros and cons of implementing vaccination for children are also experienced in Indonesia. Although vaccination among the adult population has yielded good results, parents are concerned about vaccinating their children. The Covid-19 vaccination for children aged 6 to 11 years began in December 2021, targeting 26.5 million children. However, this children's vaccination programme raised parents' concerns regarding the safety aspect of the vaccine following death incidents of several children due to vaccination (Budianto, 2022; Aditya, 2022). Consecutively, the occurrence of misinformation related to the potential negative effects of the vaccine on children's health went viral on social media, resulting in numerous negative responses which reflected hesitancy toward children's vaccination. The events presented on online and social media encouraged the public to express their rejection and propose the discontinuation of COVID-19 vaccination in children, asking not to risk children's future because of the side effects of the vaccines. The most

common side effects of COVID-19 vaccines are fever, sore arm, headache, drowsiness, nausea, diarrhea, and skin rash (Araminda & Ramatillah, 2022).

Studies have covered factors associated with parental vaccine hesitancy. Several most prevalent factors encouraging the hesitancy were the belief that all vaccines are not safe (Khatatbeh et al., 2022), concern about vaccine side effects (Wojcicki et al., 2022), low COVID-19 perceived risk, belief that vaccines are not effective (Ali et al., 2022), and low health beliefs toward vaccination (Du et al., 2022). Common reasons among parents who were willing to vaccinate their children were the belief that the vaccine will protect their children and family, and the perceived effectiveness of the vaccine (Ng et al., 2022). More worryingly, many parents who refused to vaccinate their children and/or themselves still agreed to send their children back to school (Pudjiadi et al., 2022)

Vaccination against COVID-19 in children is the most effective way to reduce the burden of disease and ensure a safe return to face-to-face schooling and other social activities. The role of parents is very important in determining the success of the national vaccination acceleration programme. Despite many concerns surrounding the implementation of COVID-19 vaccination for children in Indonesia, evidence of factors encouraging vaccine acceptance among Indonesian parents is still poorly documented in any literature. Therefore, by identifying parental health beliefs toward vaccination, this study aims to examine factors associated with parental willingness to vaccinate their children.

LITERATURE REVIEW

Research on parental acceptance of vaccines in children in various countries can be found in previous literature (Alfieri et al., 2021; Bono et al., 2022; Fazel et al., 2021; Kyprianidou et al., 2021; Rane et al., 2021; Suran, 2022), but up till now, there has been no research that specifically discusses this topic in Indonesia. Thus, the novelty offered in this study is to produce an analysis of parental acceptance of the implementation of COVID-19 vaccination among children in Indonesia. Mapping the factors associated with parental acceptance of COVID-19 is important as a basis for further handling the fatal effect of the pandemic on children, and in determining the right message and media for the government in information on policies that have been and will be carried out.

A study in India explained how the lack of parental knowledge related to vaccine safety and side effects can cause an inadequate intention to vaccinate children (Padhi et al., 2022). The high level of parental refusal on COVID-19 vaccine for children at the earlier phase of its introduction has invited scholars from around the globe to study this issue from various perspectives. For instance, Wang et al. (2022) conducted an experimental study to see how the framing of COVID-19 information may affect parents' vaccination uptake. A study in Ireland examined positive and negative attitudes as factors associated with vaccine acceptance and hesitancy (Marron et al., 2022). Al-Qerem et al. (2022) discussed vaccine acceptance from the knowledge, attitudes and practice (KAP) perspective. Aside from knowledge and attitudes, Akgün et al. (2022) examined concerns about the safety and acceptability of vaccines as the negative predictors of vaccine acceptance in Turkey. While several studies in middle-east countries consistently explored the relationship between sociodemographic aspects with vaccination intention (AlKetbi et al., 2022; Kharaba et al., 2022; Swed et al., 2022). Additionally, a review study has summarised the contribution of trust in public willingness to accept vaccination, in which, trust was divided into three

categories; trust in the quality and safety of vaccines, institutional trust, and interpersonal trust towards those who communicate about vaccines.

Attitude is one of the most used frameworks when studying vaccination intention. Attitude is defined as individual evaluative dispositions and judgments about an entity, it can be in a form of a being, thing, event, idea, issue, or action) that is derived from their experience or situation. Attitude has three main components, which are cognitive, affective, and behavioural components (Marcinkowski & Reid, 2019). Attitude has been widely used as one of the dimensions to measure public willingness or intention to perform certain health behaviour in COVID-19-related studies. An earlier study in Malaysia has used this dimension to examine public feeling toward the implemented COVID-19 control measure and how the government handles the health crisis (Azlan et al., 2020). While Feleke et al. (2021) concluded that the public poor knowledge, attitude, and practice toward COVID-19 precautionary measures were among the main cause why the COVID-19 positive cases rate was high in Ethiopia (Feleke et al., 2021).

Another most used framework to predict vaccination intention is health beliefs. The health beliefs model which consists of several dimensions; perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, cues to action, and intention, has been utilised to measure vaccination intention among cross-population such as healthcare workers (Meysamie et al., 2022), students (Le et al., 2022), pregnant women (Firouzbakht et al., 2022), older adults (Siu et al., 2022), and the general population (Ung et al., 2022). In Indonesia, this model has been utilised to predict the COVID-19 booster vaccine intention among healthcare workers in Jakarta (Maria et al., 2022) and the general population in Jakarta and Bali (Wirawan et al., 2022). In a study determining factors associated with vaccine uptake among the elderly in Indonesia, health beliefs, trust in media authorities, and protocol compliance were found as unique predictors (Putri & Purnomo, 2022).

In its application, perceived susceptibility and perceived severity which are often categorised as risk perception were the most used among all the dimensions of HBM when studying vaccine acceptance. Risk perception can be defined as someone's point of view that can be various to the object he witnesses or experiences according to observation, understanding, and experience which later is realized into the concept of perception that includes understanding indicators, responses, and expectations (Mansur et al., 2022). Health risk perception is how individuals think and feel about the risk of certain diseases or negative health behaviour, which often leads to performing protective behaviours (Renner et al., 2015). Thus, COVID-19 risk perception can be defined as beliefs about the possibility of contracting COVID-19 infection. In a prior study, Dryhurst et al. (2020) suggested that risk perception is positively correlated with the adoption of disease prevention behaviour. Therefore, the understanding of individual risk perception toward COVID-19 can be an imperative tool to predict public intention to perform health behaviour of them is COVID-19 vaccination (Dryhurst et al., 2020).

Presently, the discussion about the intention to get vaccinated was dominated by two common assumptions; the increase in vaccines uptake intention was highly influenced by beliefs that the COVID-19 pandemic will last long, while the decrease in vaccines uptake intention was correlated with beliefs that the COVID-19 severity has been exaggerated by the media (Sherman et al., 2021). In their study as well, Sherman et al. (2021) also concluded that the vaccination intention among the public in the UK was positively associated with their belief and attitude toward vaccination. In some psychological studies, the intention was placed as the mediating factor which facilitates the influence of sets of independent variables

toward individual behaviour. While in the present study, this dimension will be operationalised as the measured variable.

METHODOLOGY

This study employs quantitative methodology through a survey to examine the parental acceptance of the COVID-19 vaccination among children. A total of 400 people from nine provinces in Indonesia where the vaccine has been administered for kids (Banten, DI Yogyakarta, DKI Jakarta, West Java, Central Java, East Java, East Kalimantan, Riau Islands, West Nusa Tenggara, North Sulawesi, and Bali) were involved as participants in this study. The sample size was calculated by identifying the smallest sample size of a demographic subgroup with a 5% margin of error and a confidence level of 95%.

The sample of this study was limited to parents whose children are primary school students in the selected provinces. The data of this study was through an online survey, in which the participants were asked to fill in the questionnaire via Google Forms. The survey instrument consisted of several basic information such as respondent demographics (gender, age, respondent's highest level of education, occupation, household income, children's grade at school, and children's health problems), history of COVID-19 infection and vaccination in their family, and parental health beliefs according to the dimensions of Health Belief Model (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and intention). The items of health beliefs were operationalized into sets of variables and were measured with 4 points Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree).

The instrument used in this study was adapted from Almalki et al. (2022). The internal reliability of the study instrument was examined using Cronbach's alpha, where the score of all HBM dimensions is above .70, indicating an accepted and reliable instrument. The data analysis techniques of this study involved statistical analysis using Statistical Packages for The Social Sciences (SPSS) version 26, divided into two main analyses: descriptive and inferential. A descriptive statistical analysis will be run to describe the respondent's demographic characteristics. Further, multiple regression analysis will be conducted to examine the influence of parents' health beliefs towards their intention to vaccinate their children, as well as to identify which dimension in the model significantly contributes to the intention. Additionally, an analysis of variance (ANOVA) will be carried out to see whether there is a significant difference in terms of vaccination intention between groups in each respondent's demographics.

RESULTS AND DISCUSSION

Respondent Characteristics

The data collection process was conducted from August until October 2022. A total of 400 respondents from different provinces in Indonesia were involved in this study, where 269 (67.2%) of them were female. Most of the respondents were aged 31-50 years old (77.3%). Half of the respondents are bachelor's degree holders, and 164 (41.0%) of them reported having a household income ranging from 1 to 5 million Rupiah per month. There was a slight difference in children's grade levels at school, in which 190 (47.5%) of them were in the lower grade, and 210 (52.5%) were in the upper grade. Most respondents (90.5%) reported that their children had no health problems or long-term diseases. The overall respondent characteristics are presented in Table 1 below.

Table 1: Characteristics of respondent

Characteristics	Number (%)
Gender	
Male	131/400 (32.8)
Female	269/400 (67.2)
Age	
18-30 years old	64/400 (16)
31-40 years old	178/400 (44.5)
41-50 years old	129/400 (32.8)
51-60 years old	27/400 (6.8)
>60 years old	2/400 (.5)
Highest level of education	
No schooling completed	1/400 (.3)
Primary school	2/400 (.5)
Lower secondary school	6/400 (1.5)
Upper secondary school	103/400 (25.8)
Bachelor's degree	200/400 (50)
Master's degree	73/400 (18.3)
Doctorate	15/400 (3.8)
Occupation	
Civil servant	51/400 (12.8)
Private employee	108/400 (27.0)
Entrepreneur	25/400 (6.3)
Merchant	13/400 (3.3)
Teacher/lecturer	75/400 (18.8)
Police/army	1/400 (.3)
Housewife	107/400 (26.8)
Agriculture and forestry worker	2/400 (.5)
Others	18/400 (4.5)
Household income	
<Rp. 1,000,000	33/400 (8.2)
Rp. 1,000,000 – Rp. 5,000,000	164/400 (41.0)
Rp. 5,000,000 – Rp. 10,000,000	106/400 (26.5)
> Rp. 10,000,000	97/400 (24.3)
Children's grade	
Lower grade (grades 1 – 3)	190/400 (47.5)
Upper grade (grades 4 – 6)	210/400 (52.5)
Do your children have any health problems / long-term diseases?	
Yes, more than one disease	0/400 (0)
Yes, only one disease	38/400 (9.5)
No disease	362/400 (90.5)

Parental Acceptance of Children's Vaccination

Descriptive statistical analysis was run to explore the level of parental acceptance toward COVID-19 vaccination among children. The mean value for each HBM variable will be a basis to indicate the level of acceptance. The results suggested that the level of acceptance was generally high, ranging from 2.72 – 3.52 on average on a scale of 1 – 4. Table 2 below presents the mean value for each study variable.

Table 2: Mean value of Health Beliefs Model variables

Variables	Mean
Perceived Susceptibility	2.72
Perceived Severity	2.80
Perceived Benefits	3.31
Perceived Barriers	2.79
Cues to Action	3.52
Intention	3.34

Factors Associated with Parental Intention to Vaccinate Their Children

A multiple regression analysis was conducted to examine factors associated with parental intention to vaccinate their 6-12 years old children based on the dimension of health belief models. The multiple regression model with all five predictors (perceived susceptibility, perceived severity, perceived benefits, perceived barrier, and cues to action) was statistically significant with $R^2 = .339$, $F(5, 394) = 40.36$ $p < .001$. It was found that respondents' perceived susceptibility to COVID-19 ($\beta = .146$, $p = .012$), perceived benefits ($\beta = .249$, $p = .000$) and perceived barrier of vaccination ($\beta = -.316$, $p = .000$), and cues to action ($\beta = .220$, $p = .000$) significantly predicted their intention to vaccinate their children. Parents' perceived barrier to vaccination negatively influenced the dependent variable, in which, the higher their perception of the vaccination barrier, the less likely it is for them to intend to vaccinate their children. Perceived severity ($\beta = -.015$, $p = .817$) was the only variable within the model which did not significantly influence the vaccination intention. The overall result of the multiple regression analysis is presented in Table 3 below.

Table 3: Results of multiple regression analysis

Variables	Unstandardised B	Standardised Coefficients Beta	t	Sig.	95.% CI	
					Lower	Upper
Per. Susceptibility	.051	.146	2.520	.012	.011	.090
Perc. Severity	-.006	-.015	-.231	.817	-.056	.044
Perc. Benefit	.154	.249	4.556	.000	.088	.221
Perc. Barrier	-.090	-.316	-6.942	.000	-.116	-.065
Cues to Action	.104	.220	4.224	.000	.056	.153

Dependent variable: Vaccination intention

The results of multiple regression analysis suggested health beliefs as a significant predictor of parental vaccination intention with a total of 33.9% of variances that can be predicted by the independent variables. Noting that the perceived severity was the only unsignificant predictor in the model, it indicates that the parental perception or concern of their kids experiencing worse conditions when contracting COVID-19 would not be affecting their intention to vaccinate their children. This is maybe because kids are more resilient to the infection compared to the adult age group. Several studies have documented that although the likelihood of COVID-19 infection among kids was no different from among adults, they are less likely to develop severe symptoms (Zimmermann & Curtis, 2020). In addition, a previous study in Indonesia revealed that most of the COVID-19 cases involving kids in the country are asymptomatic (Soebandrio et al., 2021). Another factor that can be linked to this low level of perceived severity is the fact that the COVID-19 vaccines have been widely administered and nearly reach the whole targeted population in the country (78.2% as of July 2022) (Reuters, 2022). However, despite the insignificant influence of perceived

severity on vaccination intention, parental risk perception of COVID-19 infection, measured by the perceived susceptibility variable, was found as a unique predictor in the model.

Perceived vaccination benefits, like in other studies, significantly influenced parents' intention to vaccinate their children (Goren et al., 2022; Meysamie et al., 2022; Yu et al., 2022). While low perceived benefits were associated with higher vaccine hesitancy (Du et al., 2021; Fieselmann et al., 2022). In this study, parents were asked their opinion on how COVID-19 vaccines can decrease the worry of their children contracting COVID-19 and how it helps to protect their children from the infection and the potential severe effect caused.

The significant influence of cues to action variables shows the importance of external factors in influencing parents' vaccination intention. In this study, cues to action were measured by three items; willingness to vaccinate children if there is adequate information, willingness to vaccinate children when the vaccine is already publicly accepted, and willingness to vaccinate children when the government or school make it compulsory. Previously, a cross-sectional study involving a population from five Arab countries used cues to action element with the same items plus "willingness to take vaccine by doctor's recommendation" and found it as an effective strategy to encourage vaccination (Mohammed et al., 2022). Further, this dimension also significantly influenced public willingness to take COVID-19 booster injections in China (Hu et al., 2022), otherwise, another study noted that perceiving no cues to action was significantly associated with vaccine hesitancy and vaccine resistance among the studied population in the same country (Rehati et al., 2022).

Parental vaccination intention was negatively influenced by their perceived barriers. This indicates that the perception of the vaccination barrier may cause parents to not vaccinate their children. Barriers to vaccination were captured in previous studies, for instance, difficulties in obtaining permission from the employer and the presence of more than two comorbidities (Octavius et al., 2022). If not addressed properly, a more problematic implication might rise, for instance, negative attitudes toward vaccination. An earlier study conducted in China highlighted the positive and significant association between perceived barriers and vaccine hesitancy (Du et al., 2022). In line with the findings of this study on parental perceived severity, parents who are less worried about COVID-19 risks to their child were more likely to be vaccine-hesitant parents (Ruiz & Bell, 2022). Therefore, several proactive actions need to be taken to address the concerning issues of vaccination among children. A tailored health education programme can be developed to increase parental perceived severity. Identifying barriers which could prevent parents from accessing and receiving vaccines for their children is also imperative. The availability of adequate information from media and healthcare workers personally can play a role as social norms that the public may refer to when seeking vaccine information. Several aspects can be taken into account when promoting the importance of vaccination among parents, such as vaccine effectiveness, confidence, convenience, and advantages, and emphasising that vaccination is a shared responsibility (Harapan et al., 2020; Susilawaty et al., 2021).

Respondent Demographics and Vaccination Intention

A one-way ANOVA was performed to examine the relationship between demographic variables and respondents' vaccination intention. The analysis revealed that the parental vaccination intention was significantly different within gender [$F(1, 398) = 4.244$, $p = .040$], age [$F(4, 395) = 3.634$, $p = .006$], and household income [$F(3, 396) = 3.946$, $p = .009$]. Female respondents were more intended to vaccinate their children compared to male respondents.

Further, the Tukey HSD test for multiple comparisons also found that the mean value of vaccination intention was significantly different between 18-30 years old and 31-40 years old respondents (p = .007, 95% C.I. = -0.84, -0.08), 18-30 years old and 41-50 years old respondents (p = .013, 95% C.I. = -0.86, -0.06), and between participants with Rp. 1,000,000 – 5,000,000 and > Rp. 10,000,000 household income. While the difference in vaccination intention within the level of education, occupation, children's grade, and children's health problem was not statistically significant.

Table 4: Association between demographic variables and vaccination intention

Demographics	N (%)	*df*	F	p-value
Gender		(1, 398)	4.244	**.040**
Male	131/400 (32.8)			
Female	269/400 (67.2)			
Age		(4, 395)	3.624	**.006**
18-30 years old	64/400 (16)			
31-40 years old	178/400 (44.5)			
41-50 years old	129/400 (32.8)			
51-60 years old	27/400 (6.8)			
>60 years old	2/400 (.5)			
Highest level of education		(6, 393)	1.205	.303
No schooling completed	1/400 (.3)			
Primary school	2/400 (.5)			
Lower secondary school	6/400 (1.5)			
Upper secondary school	103/400 (25.8)			
Bachelor's degree	200/400 (50)			
Master's degree	73/400 (18.3)			
Doctorate	15/400 (3.8)			
Occupation		(7, 392)	.900	.506
Civil servant	51/400 (12.8)			
Private employee	108/400 (27.0)			
Entrepreneur	25/400 (6.3)			
Merchant	13/400 (3.3)			
Teacher/lecturer	75/400 (18.8)			
Police/army	1/400 (.3)			
Housewife	107/400 (26.8)			
Agriculture and forestry worker	2/400 (.5)			
Others	18/400 (4.5)			
Household income		(3, 396)	3.946	**.009**
<Rp. 1,000,000	33/400 (8.2)			
Rp. 1,000,000 – Rp. 5,000,000	164/400 (41.0)			
Rp. 5,000,000 – Rp. 10,000,000	106/400 (26.5)			
> Rp. 10,000,000	97/400 (24.3)			
Children's grade		(1, 398)	1.216	.271
Lower grade (grades 1 – 3)	190/400 (47.5)			
Upper grade (grades 4 – 6)	210/400 (52.5)			
Do your children have any health problems / long-term diseases?		(1, 398)	3.104	.079
Yes, more than one disease	0/400 (0)			
Yes, only one disease	38/400 (9.5)			
No disease	362/400 (90.5)			

Bolded values: $p < .05$

Sociodemographic characteristics have been highlighted as factors associated with vaccine acceptance and hesitancy in previous literature. This study found that female respondents, aged between 18 – 30 years old, with lower household income were having a lower vaccination intention. Similarly to this, the mother population with low household income were reported to express hesitancy toward vaccination in a previous study, and their primary concern was related to vaccine safety (Ruiz & Bell, 2022). Other than safety concerns, many young mothers fear vaccinating their children because they are still too young (Kolek et al., 2022), and concerns about immediate or long-term vaccine side effects on their young children (Fisher et al., 2022). To overcome this issue, we need to underscore the importance of strategic health messaging and transparency when communicating about the safety of the COVID-19 vaccine. Several studies also highlighted the role of healthcare workers in providing recommendations and consultation before vaccination (Footman et al., 2022).

Interestingly, there was no significant association between respondents' level of education with vaccination intention. On the contrary, a study conducted among the general population in Macao suggested that education is significantly correlated with intention (Ung et al., 2022). The findings of the present study might be evidence that the COVID-19 vaccination messaging is already clear and understandable for the public in general. Indonesian health authorities indeed have taken many approaches to optimise the delivery of vaccine information such as establishing a one-stop information centre on coronavirus control, inviting state-owned and private media organisations to support countering vaccine misinformation on social media, and providing a specific feature on the website to combat disinformation related to the vaccine (Triwardani, 2021). Another strategy to increase public belief about the safety of the vaccine is by prioritising the healthcare workers as the first party to receive vaccine injections (Theodorea et al., 2021), and even making president Joko Widodo the first recipient to demonstrate his government support for the vaccination programme.

Parental vaccination intention did not differ in respondents' children's grades at school and children's health problems. In their study covering vaccination coverage among Chinese population, Sun et al. (2022) found a significant difference in terms of willingness to take vaccines according to occupational categories, where the frontline port workers and healthcare providers were more likely to accept the vaccine, while public places and commercial service staff was the occupational category with the lowest intention to receive vaccines. Another study in the same country showed a contrasting result. Lin et al. (2020) reported those who are working in the service sector and self-employed as more likely to express vaccination intention. In the United States, the construction sector was the occupational category with the highest prevalence of vaccine hesitancy (King et al., 2021).

Studies related to vaccines from various perspectives have produced recommendations as well as solutions for various vaccination problems. The safety of COVID-19 vaccination and the lack of clear benefits are recommendations for governments, especially health authorities to rethink their vaccination policies (Walach et al., 2021). Innovative approaches such as culturally aligned messaging strategies for dealing with vaccine hesitancy are needed to encourage vaccination (Foxworth et al., 2021). Mohammed et al. (2022) listed strategies to encourage children's vaccination intake, which are providing doctor's recommendations, and adequate information, and explaining that the COVID-19 vaccine is already publicly accepted. The likelihood of female respondents having a lower intention to vaccinate their children indicated that the mother plays more contribution in vaccination decision-making. Therefore, a strategic approach needs to be taken to reach this

particular population, especially young mothers, to convince them that vaccine is safe and beneficial for children's health.

CONCLUSION

This study revealed that the overall vaccination acceptance is high among parents in Indonesia. Parents' intention to vaccinate their children was significantly influenced by their health beliefs. The multiple regression analysis suggested perceived susceptibility, perceived benefits and cues to action as significant predictors which positively influenced the vaccination intention, while the perceived barrier was identified as a negative predictor of the dependent variable in the model. Perceived severity was the only dimension in Health Beliefs Model (HBM) which did not significantly contribute to parental vaccination intention. The analysis of variance (ANOVA) was conducted to examine the relationship between respondents' demographic characteristics and their vaccination intention. There was a significant mean difference in parental intention within gender, age group, and household income. Female respondents expressed a lower intention compared to males, respondents within the 18-30 age group had a significantly lower intention compared to the 31-40- and 41-50-years old age group, and respondents with Rp. 1,000,000 – Rp. 5,000,000 million monthly household income indicated a lower intention as compared to those with > Rp. 10,000,000 household income. There was no significant association between respondents' highest level of education, occupation, children's grade at school and children's health problems with the intention to vaccinate their children. The findings of this study emphasised the need to provide a more strategic health messaging and health education programme to increase the parental perception of the severity of COVID-19 infection for their children. It is also important to address some barriers which could potentially prevent parents from vaccinating their children. Frontliners, as a public hope in overcoming the pandemic, need to be equipped with adequate health communication skills so that they can provide effective consultation, recommendations, and explanations about the importance of vaccination for children.

There are several limitations to this study. Due to time constraints, this study only managed to attain 400 individuals as study participants. A larger number of respondents is recommended for future studies to assess parental vaccination intention in Indonesia. Next, the number of samples from each selected province was not proportionate, most respondents who participated in this study were from DKI Jakarta, West Java, and Banten province. Therefore, this study could not provide a comparison of vaccine acceptance levels based on the respondent's province of residence. We also encourage future studies to explore the role of information sources and media choice in influencing vaccine acceptance. Lastly, with various concerns relating to children's vaccination in Indonesia, future studies are recommended to explore negative attitudes, misinformation issues, and other factors that contribute to vaccine hesitancy in the country.

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BIODATA

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