CLINICAL AND EXPERIMENTAL VACCINE RESEARCH

Clin Exp Vaccine Res 2023;12:240-248
https://doi.org/10.7774/cevr.2023.12.3.240
pISSN 2287-3651 • eISSN 2287-366X

Factors associated with parental intention to vaccinate their preschool children against COVID-19: a cross-sectional survey in urban area of Jakarta, Indonesia

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Received: March 10, 2023
Revised: April 7, 2023
Accepted: April 12, 2023

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No potential conflict of interest relevant to this article was reported.

This research is a preliminary study in order to develop a full research project about immune responses among children upon receiving the Comirnaty vaccine in Indonesia, that funded by Directorate of Research and Development, Universitas Indonesia under Hibah PUTI 2023 (Grand number: 1394).

Purpose: We reported a survey-based study assessing the parental intention to vaccinate children of 5 to 7 years old against coronavirus disease 2019 (COVID-19). The aim of this study is to assess factors influencing the parental intention to vaccinate their children against COVID-19.
Materials and Methods: This study adopted a cross-sectional design, held at the public health center of Senen district, Jakarta, Indonesia from November 1–30, 2022. The off-line questionnaires were distributed via the school administrator to all eligible parents. Factors associated with intention to vaccinate were analyzed with the regression logistic models.
Results: Of the 435 parents in this study, 215 had already vaccinated their children against COVID-19 (49.4%), and the overall intention of the participants to vaccinate was 69.7%. Factors associated with intention to vaccinate the children against COVID-19 were parental employment status, parental COVID-19 vaccine status and concern of contracting COVID-19. Parents who are employed, had completed vaccines with COVID-19 booster vaccine, and had concern of their children contracting COVID-19 were more likely to vaccinate their children (odds ratio [OR], 2.10; 95% confidence interval [CI], 1.22–3.69; p=0.011; OR, 2.15; 95% CI, 1.21–3.83; p=0.013; OR, 2.40; 95% CI, 1.34–4.30; p=0.004, respectively). Concern on the vaccine's side effects was negatively associated with the willingness to vaccinate.
Conclusion: This study showed that childhood COVID-19 vaccine only covered half of the population, with parental intentions for childhood COVID-19 vaccination being high, reaching almost two-thirds of the study participants. Factors influencing parental intentions were employment status, parental COVID-19 vaccine status, concerns about COVID-19 and concerns about vaccine side effects.

Keywords: COVID-19, Parents, Intention, Pediatrics, Vaccination, Indonesia

Introduction

The coronavirus disease 2019 (COVID-19) has devastated the healthcare and public health institutions worldwide since the beginning of 2020. One population of interest during COVID-19 pandemic is the pediatric population. During the initial pandemic phase, infected children represented 1% of reported global cases [1]. However, along with the emergence of the Delta and Omicron variants, infection in children appeared to be more frequent and severe [2]. The recent data in 2022 reported an increasing number of infected children during a surge of the Omicron variant to 12.9% of reported global cases [3].

Similarly, while the incidence of COVID-19 among Indonesian children at the beginning of the pandemic were reported as 1%–2% of total cases, recent data in December 2022 showed increased incidence to 13.5% [4]. The case fatality rate of children with COVID-19 in Indonesia in 2021 was 1.4 in which Indonesia had the highest child deaths due to COVID-19 in Asia Pacific [5,6]. In 2021, the Delta variant rampantly caused infection across Indonesia, causing it to become Asia's pandemic epicenter and increasing cases of pediatric COVID-19 [7]. The infected children could transmit the virus to others, impacting vulnerable elderlies in the community [8]. The COVID-19 pandemic also has indirect consequences, such as declining in routine childhood immunizations and worsening of mental, emotional, social, and physical wellbeing among children. Taken together, it is understandable that parents were concerned about COVID-19 among Indonesian children.

The Indonesian Food and Drug Agency has recently issued a recommendation to vaccinate children of 6 months till 5 years of age by using the Comirnaty vaccine (Pfizer-BioNTech, Mainz, Germany), in December 2022 [9]. This age group partly comprises of pre-school aged children, who are considered to have extensive social interaction with individuals outside of their families, and are vulnerable to be infected by various vaccine-preventable diseases, and at the same time, could become the sources of infection within their families [10]. Therefore, the vaccination coverage among pre-school age children, including vaccination against COVID-19, must be increased. Although survey in early pandemic showed that the majority of Indonesians were willing to receive COVID-19 vaccine, the parental intention to vaccinate their children against COVID-19 have not been assessed yet [11].

Here, we reported a survey-based study assessing the parental intention to vaccinate children of 5 to 7 years old against COVID-19. This survey served as an initial part of our study to determine immune responses among those children upon receiving the Comirnaty vaccine. Factors influencing the parental intention to vaccinate their children were analyzed as well.

Materials and Methods

Study design and subject

This study adopted a cross-sectional design, held at the public health center of Senen district, Jakarta, Indonesia from November 1–30, 2022. To improve quality of reporting, the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines were followed [12]. Schools in the Senen district were randomly chosen via the cluster random sampling methods. Parents having at least one child of 5 to 7 years old who attend a pre- or elementary schools were eligible to participate in the study. The offline questionnaires were distributed via the school administrator to all eligible parents. The questionnaires, which took approximately 10 minutes to complete, consisted of 35 questions on demographic data, COVID-19 vaccine status of the parents and the children, intention to allow their children to be vaccinated against COVID-19 and reasons associated with it (Supplement 1).

The questionnaire comprised demographic variables (such as gender, age of the parents, employment status, income, parental and children's history COVID-19, as well as the educational level) and variables associated with parental willingness to vaccinate their children against COVID-19. The parental status of COVID-19 vaccination was asked via "Have you receive COVID-19 vaccine? (yes/no)" and "If yes, how many times? (1/2/3 times)." The family's concern of COVID-19 was asked via "Are you worried that you or your family members may have COVID-19? (yes/no)." The concern of vaccination-associated side effects was asked via "Are you worried about vaccine side effect? (yes/no)." Next, the parents were asked whether they were willing to vaccinate their children against COVID-19, in which the answers were categorized in yes or no. Subsequently, the reasons on willingness to vaccinate their children were asked via "Please state the most compelling reason why you want your child to receive a COVID-19 vaccine : (1) I want to protect my child from COVID-19; (2) I'm worried of getting COVID-19; (3) I'm worried about my child bringing the coronavirus from school and infecting the family; (4) there are many COVID-19 cases in my neighborhood; (5) my healthcare provider suggested to take COVID-19 vaccine; and (6) others." Vice versa, the reasons on unwillingness to vaccinate their children were asked via "Please state the reason why you do not want your child to receive a COVID-19 vaccine: (1) I'm worried about the vaccine's side effects; (2) its effectiveness is unknown; (3) I avoid most vaccines; (4) I do not think the vaccine will prevent infection; (5) it's inconvenient to take a vaccine that requires multiple doses; (6) I do not think COVID-19 virus will cause serious illness; and (7) others."

The survey validity was tested with a pilot study involving 20 parents in schools that were not a part of the study population. Before filling the questionnaire, all participants were

given written explanations and informed consents were obtained. The sample size was calculated based on the rule of thumb for logistic regression equation, according to the number of dependent variables to be explored, and calculated to be a minimum of 110 subjects.

Statistical analyses

Descriptive data were presented as means and standard deviations (SD) for continuous variables, while the categorical variables were presented as frequency and percentage. Chi-square tests were performed to assess the association between demographic characteristics and parental vaccine willingness, with statistical significance defined as two-sided $p<0.01$. The factors associated with willingness to vaccinate that had significance level with p-value less than 0.05 were further analyzed by the regression logistic models. The statistical analysis was performed using the IBM SPSS Statistics for Windows ver. 26.0 (IBM Corp., Armonk, NY, USA).

Ethical approval

The study protocol was approved by The Ethics Committee of The Faculty of Medicine, University of Indonesia and Cipto Mangunkusumo Hospital (protocol number: 22-09-1080). Informed consent was confirmed by the by the Ethics Committee of the Faculty of Medicine University of Indonesia and Cipto Mangunkusumo Hospital.

Results

The eligible participants of this survey-based study were parents of children attending pre- or elementary school in the Senen district, Jakarta, Indonesia. A parent of one eligible child was counted as one participant. Out of total distributed questionnaires (n=612), 506 participants completed the questionnaires (i.e., the proportion of completed questionnaires was 82.7%). After excluding 106 parents who did not have 5–7-year-old children, the final sample included 435 parents. Of the 435 parents in this study, 215 had already vaccinated their children against COVID-19 (49.4%). The summary of this survey is described in Fig. 1.

The age range of recruited subjects was between 24–65 years old, with the mean±SD age was 36.1±6.1 years old. Majority of the subjects were females (77%) with low socioeconomic status (81.1% have incomes less than the minimum wage in Jakarta). The overall intention of the participants to vaccinate their children against COVID-19 was 69.7%. The details of demographics of the participants are shown in Table 1.

Among 435 participants, 215 (49.4%) reported that their children were vaccinated against COVID-19. Factors that might influence the parental willingness to vaccinate their children were analyzed with the bivariate analysis (n=220) (Table 2). The results indicated that there were four main factors: first, parents who were employed were more likely to vaccinate their children against COVID-19 (odds ratio [OR],

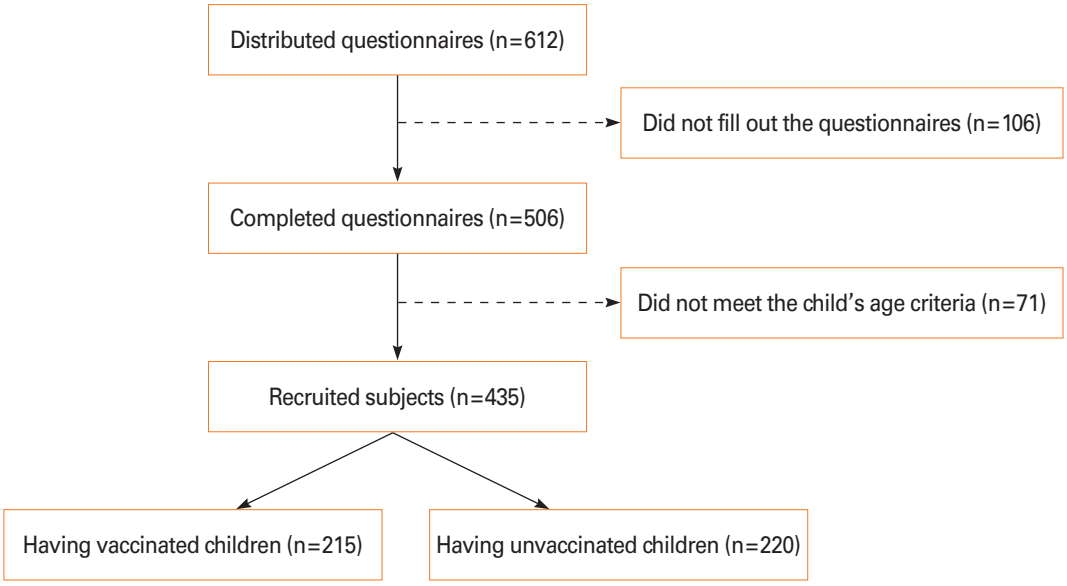

Fig. 1. Summary of the survey. The questionnaire was distributed directly to eligible parents who were having children at the corresponding preschool.

 https://doi.org/10.7774/cevr.2023.12.3.240

Table 1. Demographics of the recruited subjects (n=435)

Characteristic	No. (%)
Gender	
Male	100 (23.0)
Female	335 (77.0)
Age (yr)	
17–25	6 (1.4)
26–35	210 (48.3)
36–45	179 (41.1)
46–55	33 (7.6)
55–65	7 (1.6)
Employment status	
Employed	221 (50.8)
Unemployed	214 (49.2)
Income[a]	
Below the minimum wage	353 (81.1)
Equal or above the minimum wage	82 (18.9)
Level of education	
Illiterate	16 (3.7)
Elementary	29 (6.7)
Junior high school	51 (11.7)
High school	225 (51.7)
University of bachelor degree	114 (26.2)
No. of people in household (person)	
2	6 (1.4)
3	50 (11.5)
4	137 (31.5)
>4	242 (55.6)
Trust in health facility	
Yes	416 (95.6)
No	19 (4.4)
Age distribution of children (yr)	
5	80 (18.4)
6	98 (22.5)
7	257 (59.1)
Parental COVID-19 vaccination status	
Vaccinated once	38 (8.7)
Vaccinated twice	158 (36.3)
Vaccinated 3 times/received booster	185 (42.5)
Not vaccinated	54 (12.4)
Parental history of COVID-19	
Yes	398 (91.5)
No	37 (8.5)
Children's COVID-19 vaccination status	
Vaccinated	215 (49.4)
Not vaccinated	220 (50.6)
History of COVID-19 in children	
Yes	398 (91.5)
No	37 (8.5)
Parental willingness to vaccinate the children against COVID-19	
Willing to vaccinate	303 (69.7)
Not willing to vaccinate	132 (30.3)

COVID-19, coronavirus disease 2019; IDR, Indonesian rupiah.
[a]Minimum wage in Jakarta for January 2023 is IDR 4,901,798 (approximately US$ 323.32).

2.10; 95% confidence interval [CI], 1.22–3.69; p=0.011). Second, parents who completed vaccination that includes COVID-19 booster vaccine were more likely to vaccinate their children (OR, 2.15; 95% CI, 1.21–3.83; p=0.013). Third, the parental willingness to vaccinate the children was also associated with their concern of contracting COVID-19 (OR, 2.40; 95% CI, 1.34–4.30; p=0.004). And fourth, the parental willingness was negatively associated with their concern on vaccination's side effects (OR, 2.80; 95% CI, 1.53–5.13; p=0.001). The aforementioned factors that had significance level with p-value less than 0.05 were further analyzed by the multivariate analysis, as described in Table 3.

Among 220 subjects whose children were not yet vaccinated against COVID-19, 128 parents (58.1%) were willing to vaccinate their children against COVID-19. Fig. 2 depicts various reasons of parental willingness to vaccinate their children against COVID-19. The most frequent stated reason was to protect the children and other members of the family from COVID-19. Fig. 3 describes various reasons of parental unwillingness to vaccinate their children against COVID-19. The most frequent stated reason was the side effects of the vaccine against COVID-19.

The reasons given by the parents who refused to vaccinate their children against COVID-19 were listed in Fig. 3. The most common concern was the side effects of the vaccines, followed by the unknown efficacy of the vaccines.

Discussion

The vaccination coverage against COVID-19 among children in Indonesia is still low [4]. Among the pediatric population, priority should be given to 5–7 years of age pre-school children as they were in a period of their life when they are starting a more extensive social interaction outside of their nuclear family. The unique timeline put them at a higher risk of contracting communicable diseases as well as becoming the sources of infection [8]. Although the COVID-19 vaccination with the CoronaVac vaccine (Sinovac Biotech Ltd., Beijing, China) started in December 2021, the uptake among 6–7-year-old children was low. The low coverage was further restricted by the lack of CoronaVac vaccine availability in Indonesia during the writing of this report in late 2022. A temporary solution was provided in December 2022, when the Indonesian Food and Drug Agency released emergency used of authorization for the Comirnaty vaccine to be used by children of 6 months to 11 years old [9]. We report here the parental willingness to vacci-

Table 2. Factors associated with parental willingness to vaccinate their children against COVID-19 (n=220)

Characteristic	Willing tovaccinate		p-value	OR (95% CI)
	Yes (n=128)	No (n=92)		
Gender			0.392	1.44 (0.72–2.88)
Male	28 (65.1)	15 (34.9)		
Female	100 (56.5)	77 (43.5)		
Age (yr)			0.850	0.89 (0.46–1.71)
>30	99 (57.6)	73 (42.4)		
≤30	29 (60.4)	19 (39.6)		
Employment status			0.011**	2.10 (1.22–3.69)
Employed	75 (67.0)	37 (33.0)		
Unemployed	53 (49.1)	55 (50.9)		
Income[a)]			0.078	1.93 (0.98–3.80)
Below the minimum wage	35 (70.0)	15 (30.0)		
Equal or above the minimum wage	93 (54.7)	77 (45.3)		
Education level			0.625	1.22 (0.67–2.24)
High school and above	37 (61.7)	23 (38.3)		
Less than high school	91 (56.9)	69 (43.1)		
Parental vaccine COVID-19 status			0.013**	2.15 (1.21–3.83)
Booster and primary	57 (69.5)	25 (30.5)		
Uncomplete or unvaccinated	71 (51.4)	67 (48.6)		
Parental history of COVID-19			0.920	1.22 (0.43–3.47)
Yes	10 (62.5)	6 (37.5)		
No	118 (57.8)	86 (42.2)		
Children's history of COVID-19			0.920	1.22 (0.43–3.47)
Yes	10 (62.5)	6 (37.5)		
No	118 (57.8)	86 (42.2)		
Concern of COVID-19 in family			0.004**	2.40 (1.34–4.30)
Yes	98 (64.9)	53 (35.1)		
No	30 (43.5)	30 (56.5)		
Concern of vaccine's side effects			0.001**	2.8 (1.53–5.13)
Yes	72 (50.0)	72 (50.0)		
No	56 (73.7)	20 (26.3)		

Values are presented as number (%), unless otherwise stated.
COVID-19, coronavirus disease 2019; OR, odds ratio; CI, confidence interval; IDR, Indonesian rupiah.
**p<0.05. [a)]Minimum wage in Jakarta for January 2023 is IDR 4,901,798 (approximately US$ 323.32).

Table 3. Multivariate analysis for factors associated with parental willingness to vaccinate their children against COVID-19 (n=220)

Variable	Coefficient	p-value	OR (95% CI)
Employment status	0.590	0.047	1.804 (1.01–3.23)
Concern of COVID-19 in family	1.097	0.001	2.996 (1.58–5.67)
Concern of vaccine's side effects	1.110	0.001	3.034 (1.57–5.86)
Parental COVID-19 vaccine status	0.589	0.064	1.801 (0.97–3.36)
Constanta	-1.264		

For the employment status, "unemployed" was used as the reference. For the parental COVID-19 vaccine status, "incomplete/unvaccinated" was used as the reference. For the concern of COVID-19 in family, "no" was used as the reference. For the concern of vaccine's side effect, "yes" was used as the reference. Regression logistic test: Hosmer-Lemeshow test step 1 (p=0.892). Area under curve (95% CI) step 1=73.5% (67.0%–80.1%). The regression logistic equation is Y=-1.264+0.590 (employment status)+0.589 (parental COVID-19 vaccine status)+1.097 (concern of COVID-19)+1.110 (concern of vaccine side effect).
COVID-19, coronavirus disease 2019; OR, odds ratio; CI, confidence interval.

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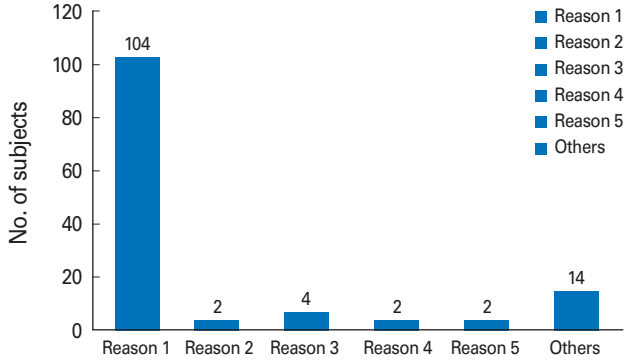

Fig. 2. Reasons of the parents regarding their willingness to vaccinate their children against coronavirus disease 2019 (COVID-19) (n=128). A number on top of each bar indicates the number of subjects choosing a particular reason. The data was collected from 128 parents out of 220 subjects whose children had not been vaccinated against COVID-19. Reason 1: I want to protect my child from COVID-19. Reason 2: I'm worried of getting COVID-19. Reason 3: I'm worried about my child bringing the coronavirus from school and infecting the family. Reason 4: there are many COVID-19 cases in my neighborhood. Reason 5: my healthcare provider suggested to take COVID-19 vaccine.

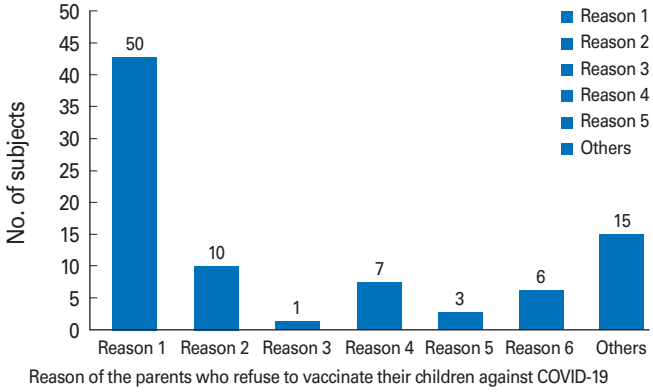

Fig. 3. Reasons of the parents who refuse to vaccinate their children against coronavirus disease 2019 (COVID-19) (n=92). A number on top of each bar indicates the number of subjects choosing a particular reason. The data was collected from 92 parents out of 220 subjects whose children had not been vaccinated against COVID-19. Reason 1: I'm worried about the vaccine's side effects. Reason 2: its effectiveness is unknown. Reason 3: I avoid most vaccines. Reason 4: I do not think the vaccine will prevent infection. Reason 5: it's inconvenient to take a vaccine that requires multiple doses. Reason 6: I do not think COVID-19 virus will cause serious illness.

nate children of pre-school age in Indonesia, following the newly available vaccine for this age group.

In the present study, the overall willingness of parents to vaccinate their children against COVID-19 was 69.7% (303/435). A systematic review by Chen et al. [13] reported that the estimated parental willingness to vaccinate their children against COVID-19 in Asia was 58.33% (95% CI, 47.96–68.01). Galanis et al. [14] in their meta-analysis found that the overall proportion of parents that intend to vaccinate their children against the COVID-19 was 60.1% with a wide range among studies from 25.6% to 92.2%. As compared to other neighboring countries in Asia, the intention of parents in South Korea and India to vaccinate their children against COVID-19 were only 34.2% and 33.5%, respectively [15,16]. This suggests that the parental willingness to vaccinate their preschool-age children against COVID-19 in our study was higher. This may be due to the COVID-19 vaccination for adults which has been implemented for approximately 2 years in Indonesia. In addition, increased parental awareness in vaccinating children also occurred after the omicron wave which has also infected many Indonesian children. The willingness of parents to vaccinate should be supported with the availability of COVID-19 vaccines for children in Indonesia in order to achieve herd immunity in this country.

Our study was conducted in Jakarta, Indonesia. As the capital city of Indonesia and as one of the main entry points for international and domestic travels in Indonesia, Jakarta is arguably a vulnerable hotspot for COVID-19 transmission. Moreover, the severe overcrowding in Jakarta has created a further strain as it has been linked to the increase in COVID-19 cases within urban communities [17]. In Indonesia, one of the most rapidly urbanizing regions in the world, the policy of the national government on the pandemic frequently encountered several limitations. For example, the social distancing was challenging to be implemented and the masks requirement was frequently flouted [18]. Therefore, it was of interest to observe severe acute respiratory syndrome coronavirus 2 transmission in Jakarta and to analyze the parental willingness to vaccinate their children in Jakarta, because the result might become a representative finding of other urban areas in Indonesia.

The willingness to vaccinate children was associated with the parental COVID-19 vaccination status. Chen et al. [13] and Galanis et al. [14] reported that the parents' or guardians' intention to receive a COVID-19 vaccine for themselves was a significant independent factor associated with vaccination intention for their children. Research on parents in Europe and Canada shows that parents' willingness to vaccinate their children was related to their own acceptance of the COVID-19 vaccine for themselves, as parents who had received at least one shot of COVID-19 vaccine were more likely to be willing to vaccinate their children [19-21]. In contrast, studies in Asia also

reported that adult vaccine hesitancy for children was related to their own vaccination against COVID-19 [22,23]. Our study shows that parents who completed vaccination that includes COVID-19 booster vaccine were more likely to vaccinate their children (OR, 2.15; 95% CI, 1.21–3.83; p=0.013). Based on the results of our data, health promotion targeting the pediatric COVID-19 vaccine should be aimed at the perception of parents first. Parents need to be enlightened that the success of resolving a pandemic is to increase community immunization through vaccination. Therefore, parents who already have a positive perception of the importance of vaccination for themselves would be more likely to have a good attitude towards the intention to vaccinate their children against COVID-19.

We also observed strong association between parents' COVID-19 vaccination intent for their children with their perception of COVID-19. The most common reason for vaccination given by parents in our study who were willing to vaccinate their children against COVID-19 was to keep their family, including the children, from COVID-19. Our report is in accordance with other studies that analyzed that the fear of COVID-19 was associated with parents' intention to vaccinate their children against COVID-19 [19,23]. Study from low to middle economic countries in 2021 also found that individuals, who were more worried or fearful about COVID-19, were more likely to accept COVID-19 vaccination for their children [24]. This is likely due to the lack of health insurance in low to middle economic countries. Therefore, considering the high cost of healthcare, parents are more concerned if their child is infected with COVID-19. A health promotion approach that resonates with parents is that prevention is better than cure. So, if parents can be convinced of the importance of prevention, then vaccination as the best preventative measure will be a priority option.

Finally, the concern of vaccine's side effects was an important factor associated with the intention of the parents to vaccinate their children against COVID-19 [13,23]. The most common reason against vaccination given by the parents who refused to vaccinate their children against COVID-19 was a concern about the vaccine's side effect, followed by the uncertainty about the efficacy of the new vaccine. These findings are in line with reports from Malaysia [25] and Saudi Arabia [26,27], that revealed the same reasons the parents had who refuse to vaccinate their children. Parents' concerns about the side effects of this vaccine need special attention by continuing to provide information regarding adverse events after immunization. Parents need to be given an explanation that the COVID-19 vaccine given to children has gone through research covering a large number of subjects, with reports of only mild side effects without serious events. Parents also need to be given an explanation that the COVID-19 vaccine used for children has received approval from the World Health Organization and has been used in many countries. With adequate information, it is hoped that parents will be less worried and can make the decision to vaccinate their children against COVID-19.

The limitation of this study includes the use of questionnaires by offline methods, that may have impacted the careless answer by the parents. Secondly, this study was conducted only in two wards in Jakarta, which may limit the general representation of the target population in Indonesia. A similar study with online questionnaires should be performed to support the current study.

In conclusion, here, we report, to the best of our knowledge, the first data regarding the parental willingness to vaccinate their preschool children in Indonesia. Our report also showed that the childhood COVID-19 vaccine coverage only covered approximately half of the population. The parental intention for childhood COVID-19 vaccination was high, reaching almost two-thirds of the study participants. Factors influencing parental intentions were employment status, COVID-19 vaccine status, concerns about COVID-19 and concerns about vaccine side effects.

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Supplementary Materials

Supplementary materials are available at Clinical and Experimental Experimental Vaccine Research website (http://www.ecevr.org).

References

1. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the chinese center for disease control and prevention. JAMA 2020;323:1239-42.
2. Khemiri H, Ayouni K, Triki H, Haddad-Boubaker S. SARS-CoV-2 infection in pediatric population before and during the Delta (B.1.617.2) and Omicron (B.1.1.529) variants era. Virol J 2022;19:144.
3. World Health Organization. WHO coronavirus (COVID-19) dashboard [Internet]. Geneva: World Health Organization; 2023 [cited 2023 Feb 8]. Available from: https://covid19.who.int/
4. Indonesian Task Force for COVID-19. COVID-19: confirmed local and area distribution map [Internet]. [place unknown]: Indonesian task force for COVID-19; 2023 [cited 2023 Feb 8]. Available from: https://covid19.go.id/peta-sebaran
5. Pulungan AB. Indonesia set to have world's highest rate of child deaths from COVID-19 [Internet]. Jakarta: APPA Bulletin; 2020 [cited 2021 Sep 18]. Available from: http://a-p-p-a.org/pdf/1202-APPA-Bulletin-79-69-may-aug-2020.pdf
6. Pudjiadi AH, Putri ND, Sjakti HA, et al. Pediatric COVID-19: report from indonesian pediatric society data registry. Front Pediatr 2021;9:716898.
7. Dyer O. COVID-19: Indonesia becomes Asia's new pandemic epicentre as Delta variant spreads. BMJ 2021;374:n1815.
8. Vardavas CI, Nikitara K, Aslanoglou K, et al. Systematic review of outbreaks of COVID-19 within households in the European region when the child is the index case. BMJ Paediatr Open 2023;7:e001718.
9. Badan Pengawas Obat dan Makanan. EUA publication of Comirnaty children's vaccines for use in children aged 6 months to 11 years [Internet]. Jakarta: Badan Pengawas Obat dan Makanan; 2022 [cited 2023 Feb 9]. Available from: https://www.pom.go.id/new/view/more/pers/670/Penerbitan-EUA-Vaksin-Comirnaty-Children-untuk-Penggunaan-pada-Anak-Usia-6-Bulan-Hingga-11-Tahun.html
10. Kusumaningrum S, Siagian C, Beazley H. Children during the COVID-19 pandemic: children and young people's vulnerability and wellbeing in indonesia. Child Geogr 2022;20:437-47.
11. Survey shows majority Indonesians are willing receive COVID-19 vaccine [Internet]. Jakarta: Ministry of Health of the Republic of Indonesia; 2020 [cited 2023 Feb 14]. Available from: https://www.unicef.org/indonesia/press-releases/survey-shows-majority-indonesians-are-willing-receive-covid-19-vaccine-once
12. Von Elm E, Altman DG, Egger M, et al. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol 2008;61:344-9.
13. Chen F, He Y, Shi Y. Parents' and guardians' willingness to vaccinate their children against COVID-19: a systematic review and meta-analysis. Vaccines (Basel) 2022;10:179.
14. Galanis P, Vraka I, Siskou O, Konstantakopoulou O, Katsiroumpa A, Kaitelidou D. Willingness, refusal and influential factors of parents to vaccinate their children against the COVID-19: a systematic review and meta-analysis. Prev Med 2022;157:106994.
15. Noh Y, Kim JH, Yoon D, et al. Predictors of COVID-19 booster vaccine hesitancy among fully vaccinated adults in Korea: a nationwide cross-sectional survey. Epidemiol Health 2022;44:e2022061.
16. Padhi BK, Satapathy P, Rajagopal V, et al. Parents' perceptions and intention to vaccinate their children against COVID-19: results from a cross-sectional national survey in India. Front Med (Lausanne) 2022;9:806702.
17. Herlinda O, Bella A, Kusnadi G, et al. Seroprevalence of antibodies against SARS-Cov-2 in the high impacted subdistrict in Jakarta, Indonesia. PLoS One 2021;16:e0261931.
18. Handayani W, Insani TD, Fisher M, Gim TT, Mardhotillah S, Adam UE. Effects of COVID-19 restriction measures in Indonesia: a comparative spatial and policy analysis of selected urban agglomerations. Int J Disaster Risk Reduct 2022;76:103015.
19. Krakowczyk JB, Bauerle A, Pape L, et al. COVID-19 vaccine for children: vaccination willingness of parents and its associated factors: a network analysis. Vaccines (Basel) 2022;10:1155.
20. Di Giuseppe G, Pelullo CP, Volgare AS, Napolitano F, Pavia M. Parents' willingness to vaccinate their children with COVID-19 vaccine: results of a survey in Italy. J Adolesc Health 2022;70:550-8.
21. Humble RM, Sell H, Dube E, et al. Canadian parents' perceptions of COVID-19 vaccination and intention to vaccinate their children: results from a cross-sectional national survey. Vaccine 2021;39:7669-76.
22. A K, Lu X, Wang J, Hu L, Li B, Lu Y. Association between

adult vaccine hesitancy and parental acceptance of childhood COVID-19 vaccines: a web-based survey in a northwestern region in China. Vaccines (Basel) 2021;9:1088.
23. Choi SH, Jo YH, Jo KJ, Park SE. Pediatric and parents' attitudes towards COVID-19 vaccines and intention to vaccinate for children. J Korean Med Sci 2021;36:e227.
24. Bono SA, Siau CS, Chen WS, et al. Adults' acceptance of COVID-19 vaccine for children in selected lower-and middle-income countries. Vaccines (Basel) 2021;10:11.
25. Ng DL, Gan GG, Chai CS, et al. The willingness of parents to vaccinate their children younger than 12 years against COVID-19: a cross-sectional study in Malaysia. BMC Public Health 2022;22:1265.
26. Ennaceur S, Al-Mohaithef M. Parents' willingness to vaccinate children against COVID-19 in Saudi Arabia: a cross-sectional study. Vaccines (Basel) 2022;10:156.
27. Almalki OS, Alfayez OM, Al Yami MS, Asiri YA, Almohammed OA. Parents' hesitancy to vaccinate their 5-11-year-old children against COVID-19 in Saudi Arabia: predictors from the health belief model. Front Public Health 2022;10:842862.

Supplement 1. Questionnaire

Survey on parents' intention to vaccinate for children 5–6 years old

1. Parent's name:
2. Address:
3. Mobile number:
4. Gender: man/woman
5. Parent's date of birth: / / (date/month/year)
6. Child's name:
7. Child's gender: man/woman
8. Child's date of birth: / / (date/month/year)
9. Child's weight (kg):
10. Child height (cm):
11. School name:
12. Village area:
13. Number of people living in 1 house:
    a. 2 people b. 3 people
    c. 4 people d. >4 people
14. Diplomas held:
    a. No school b. Primary school
    c. Junior high school d. Senior high school or equivalent
    e. DI/II/III/IV f. S1
    g. S2 h. S3
15. What is your current occupation?
    a. Not working b. Private employee
    c. Government employee d. Military/police
    e. Employee/employee/laborer f. Self-employed/self-employed
    g. Others
16. How much is your monthly income from work/business/transfer receipts (unit: million rupiah)?
    a. 0–1.8 b. 1.8–3
    c. 3–4.4 d. 4.4–7.2
    e. >7.2
17. Has your child received a coronavirus disease 2019 (COVID-19) vaccine?
    a. Yes b. No
18. Has your child ever had COVID-19?
    a. Yes b. No
19. Did your child receive diphtheria-tetanus (DT)/diphtheria-pertussis-tetanus (DPT) vaccine at age 5?
    a. Yes b. No
20. Did your child receive complete DPT (3 times) under 1 year of age?
    a. Yes b. No
21. Did your child receive the 4th DPT at 18 months to 2 years of age?
    a. Yes b. No
22. Has your child received any vaccination other than the COVID-19 vaccine in the past 1 year?
    a. Yes b. No
23. Does your child suffer from a chronic illness (long-term illness of more than 2 months)?
    a. Yes b. No

(Continued on next page)

 https://doi.org/10.7774/cevr.2023.12.3.240

Supplement 1. Continued

24. Does your child have an immune-related disease, cancer, long-term illness of more than 2 months, or congenital disease?
    a. Yes b. No
25. Does your child have a history of serious hospitalization?
    a. Yes b. No
26. Has your child ever suffered from dengue fever or dengue hemorrhagic fever?
    a. Yes b. No
27. Have you ever been affected by COVID-19?
    a. Yes b. No
28. Have you received a COVID-19 vaccine?
    a. Yes b. No
29. If yes, how many times?
    a. 1 time b. 2 times c. 3 times
30. Are you worried that you or your family members may have COVID-19?
    a. Yes b. No
31. Are you worried about the side effects of the vaccine?
    a. Yes b. No
32. Do you trust health facilities?
    a. Yes b. No
33. Do you work in a health facility?
    a. Yes b. No
34. Are you willing for your child to receive a COVID-19 vaccine?
    a. Yes b. No
35. If yes, please state the most compelling reason why you want your child to receive a COVID-19 vaccine (if you answered "yes" to No. 34)?
    a. I want to protect my child from COVID-19
    b. I am worried about getting COVID-19
    c. I am worried about my child bringing the coronavirus from school and infecting my family
    d. There are many COVID-19 cases in my neighborhood
    e. The health worker suggested it
    f. Other
36. If no, please state the reason why you do not want your child to receive a COVID-19 vaccine (if you answered "no" to No. 34)?
    a. I am worried about the side effects
    b. The effectiveness is unknown
    c. I am avoiding the vaccine
    d. I don't think vaccines can avoid getting COVID-19
    e. It is uncomfortable for my child to be injected twice
    f. I am worried that COVID-19 will have serious effects on my child
    g. I do not believe my child will get COVID-19
    h. My child has immunity because he/she has been exposed to COVID
    i. Other