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COVID-19 vaccine for adolescents with chronic disease or disabilities



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ABSTRACT

Background: Indonesia has a relatively high number of COVID-19 cases and mortalities, including children and adolescents groups. Vaccination coverage for these groups is currently low, especially in the population of children with disabilities and special needs, due to the difficulty of assisting them. The objective of this study was to share the data on the COVID-19 vaccine for adolescents with chronic diseases or disabilities.

Methods: This descriptive study uses data collected from two hospitals in September 2021. We analyzed the patients' characteristics, age groups, diagnoses, comorbidities, and adverse events following immunization (AEFI) of the adolescents injected with the COVID-19 vaccine.

Results: From a total of 94 adolescents, 51 have disabilities, and 43 have chronic disease. Disabilities include children with special needs (54%), attention deficit and hyperactivity disorder (4%), autism (11%), cerebral palsy (4%), and Down syndrome (27%). The accompanying chronic diseases vary widely, such as diabetes mellitus (28%), asthma (14%), rheumatic heart disease (14%) and thalassemia (14%). There were 6 patients found to have AEFI. Three of them have diabetes mellitus, the other two patients have thalassemia, and the other one patient has Down syndrome. Various AEFIs were found, including fever, drowsiness, weakness, dizziness, hunger, and itching. All symptoms were improved within hours and did not require hospitalization.

Conclusion: Adolescents with disabilities and chronic diseases require special assistance and extra care during vaccination. The COVID-19 vaccine is relatively safe for adolescents in these groups without significant side effects.

Keywords: COVID-19 vaccine, adolescents, disabilities, chronic disease.

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INTRODUCTION

Global health and well-being were substantially impacted by the Coronavirus Disease (COVID-19) pandemic, and these effects are still being felt well into 2021.¹ On March 2, 2020, the first case was reported in Indonesia. As of December 21, 2020, the total number of cases had increased to 671,778, and the total number of deaths was 20,085.² Concerning the number of COVID-19 cases, Indonesia is now among the top three countries in Southeast Asia and the top 20 globally.³ The COVID-19 vaccines were rapidly developed, with some already approved and available to individuals of all ages.¹ Recommendations for implementing the COVID-19 vaccination for adolescents in Indonesia starting at the end of June 2021.⁴ This paper aims to provide a slight picture of vaccine safety in adolescents

with disabilities or chronic diseases in Indonesia.

METHODS

All data were collected from two hospitals (Hermina Tangkuban Prahur Hospital and Saiful Anwar General Hospital) in September 2021. The study follows the Helsinki Declaration and its revisions. For this study, neither the patients' identities nor personal information was gathered. The total sampling method was used to gather study data from medical records. The subjects' age, gender, comorbidities, anthropometry, and adverse events after immunization (AEFI) are included in this study. This study's inclusion criteria are all adolescents (aged 11-20 years old) in the sampling hospitals who received COVID-19 vaccines and are willing to join this study. The exclusion criteria of this

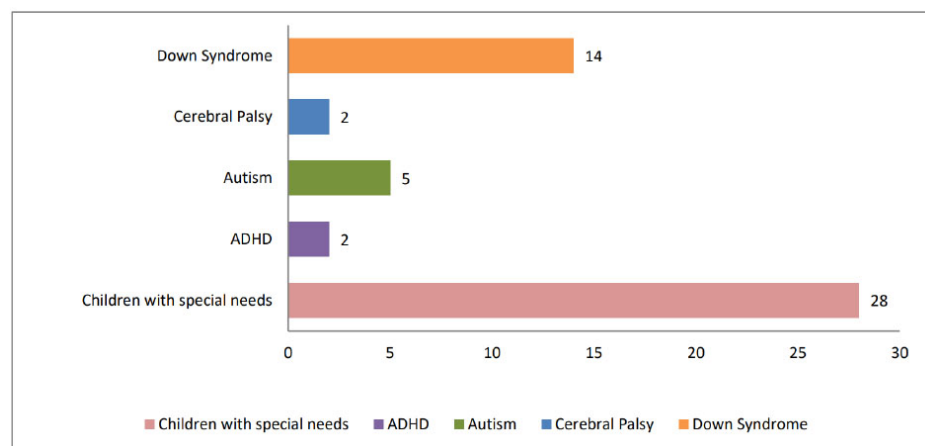
study are patients with incomplete medical records data. Since the data for this study was only gathered in one location in Indonesia, it does not accurately represent the data for the entire nation. The World Health Organization's (WHO) published criteria are adhered to by the AEFI.⁵ Data were presented as descriptive data under frequency and questionnaire, generated using Microsoft Excel.

RESULTS

We have collected 94 adolescents in this study, consisting of 43 female subjects (46%) and 51 male subjects (54%) with ages ranging from 11 to 20. There were 51 patients with disabilities (54%) and 43 patients with chronic disease (46%) (Table 1). The most frequent disability was adolescents with special needs (54%), followed by Down syndrome (26%), autism

Table 1. Demographic characteristics of patients

Demographic	All subjects n = 94 (100%)	Patients with disability n = 51 (54%)	Patients with chronic disease n = 43 (46%)
Age			
11-15	57 (60.6 %)	33 (64.7 %)	24 (55.8 %)
16-20	37 (39.4 %)	18 (35.3 %)	19 (44.2 %)
Gender			
Male	51 (54.0 %)	28 (54.9 %)	23 (53.4 %)
Female	43 (46.0 %)	23 (45.1 %)	20 (46.6 %)
BMI			
Underweight	13 (13.9 %)	8 (15.7 %)	5 (11.6 %)
Normal	54 (57.4 %)	28 (54.9 %)	26 (60.5 %)
Overweight	12 (12.8 %)	7 (13.7 %)	5 (11.6 %)
Obese	15 (15.9 %)	8 (15.7 %)	7 (16.3 %)
AEFI			
Drowsiness	3 (3.2 %)	1 (1.96 %)	2 (4.6 %)
Itchiness	2 (2.1 %)	-	2 (4.6 %)
Headache	2 (2.1 %)	-	2 (4.6 %)
Fever	2 (2.1 %)	1 (1.96 %)	1 (2.3 %)
Hunger	1 (1.1 %)	-	1 (2.3 %)
Weakness	1 (1.1 %)	-	1 (2.3 %)
Pain	1 (1.1 %)	-	1 (2.3 %)

**Figure 1.** List of disabilities among adolescent patients in this study.

(10%), cerebral palsy (6%), and attention deficit and hyperactivity disorder (ADHD, 4%) (Figure 1). The accompanying chronic diseases vary widely, such as diabetes mellitus (25.6%), asthma (15.3%), and rheumatic heart disease (15.3%) (Figure 2).

There were 7 patients presenting with AEFI after COVID-19 vaccination. The most frequent AEFI were drowsiness (3 patients), followed by itch (2 patients), headache (2 patients), fever (2 patients), hunger (1 patient), weakness (1 patient), and pain (1 patient). (Figure 3). Among patients who had AEFI, comorbidities

recorded with highest AEFI were diabetes mellitus (3 patients), thalassemia (2 patients), Down syndrome (2 patients) and obesity (2 patients) (Table 2). All symptoms improve within hours and do not require hospitalization.

DISCUSSION

Despite appearing to have a milder form of COVID-19 than adults, children, and adolescents can still get infected and experience severe symptoms at any age.⁶ Most often, COVID-19 in children presents as a feverish, coughing, flu-like illness.⁷ Approximately one-third of patients who

need to be admitted to the hospital will end up in intensive care.⁸ It is believed that children with a history of cardiovascular or respiratory diseases are more vulnerable to contracting the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). More substantial evidence is warranted, but a recent systematic review supported this idea and showed that patients with asthma or renal malformation are more susceptible to infections.⁹

The available information regarding children's involvement in the spread of SARS-CoV-2 and mucosal carriers is inconclusive.^{10,11} Nonetheless, their importance cannot be understated, given the breadth and depth of their contacts. Immunization of comorbid older adults ought to be a top priority. However, immunizing children and adolescents may raise the likelihood of developing herd immunity if not all adults will receive vaccinations (also due to their choice).¹² Immunizations for kids and teenagers should also allay concerns about their going back to school. The forced lockdown of children at home for over a year has resulted in a build-up of psychological, developmental, and educational issues. A quicker return to regular classroom instruction and peer interaction is essential to reverse these trends. Immunizations for children will also promote the return of routine pediatric care, which was severely disrupted during the pandemic and lockdown, and include vaccinations against other infectious diseases.¹³

As of December 21, 2020, the Ministry of Health (MOH) reported that 77,254 (or 11.5%) of the total 671,778 confirmed cases were related to children. Children ages 0 to 5 accounted for 0.9% of all deaths, while those ages 6 to 18 accounted for 1.8% (total cases 542; total CFR 0.7).¹⁴ Data on COVID-19 vaccination coverage in Indonesia based on MOH was 15.1 million doses of vaccine, which consisted of vaccinations for the elderly about 2 million people, public officers 6.5 million, and the rest were medical team and citizens, with a capacity injection dose per day is 500 thousand. Data on immunization coverage for Indonesian adolescents still has not yet been described.¹⁵

Because Indonesia is such a large country, the healthcare system is still

not evenly distributed throughout the country. Based on MOH data from 2019, Jakarta, the country's capital, had 7.16 primary health centers per subdistrict, compared to 2.11 in Bali. On the other hand, West Papua, one of Indonesia's less developed regions, only had 0.28.¹⁶ These numbers show how easy it is for citizens to access healthcare services. Health service disparities will significantly impact the

degree of COVID-19 vaccination coverage among adolescents.

A broad category of chronic conditions that start in childhood and can affect functioning at any stage of life is known as developmental disabilities (DDs). According to reports from 2015 to 2017, 1 in 6 children between the ages of 3 and 17 were reported to have an intellectual disability (ID), cerebral palsy,

or autism spectrum disorder (ASD).¹⁷ Some evidence suggests that certain children with developmental disabilities may be disproportionately impacted by COVID-19, both in terms of the illness itself and the pandemic's effect on service delivery, even though data from public health surveillance systems are scarce.¹⁸ Children with DDs are more likely to have medical conditions that increase their risk of developing a severe illness from COVID-19. They may also face obstacles to receiving the necessary medical care and have additional characteristics that increase their risk, such as limited mobility, the need for direct care, difficulties communicating illness symptoms, and difficulties practicing preventive measures.¹⁹

When controlling for age and sex, individuals with COVID-19 who had ASD, ID, learning disabilities, or ADHD were three to nine times more likely to be hospitalized than those without these conditions, and their hospital stays were also longer. The odds of dying were roughly three times greater for those with DDs than for those without DDs.²⁰ From March 2020 to January 2021, children with neurodevelopmental disorders were 1.6 times more likely than children without neurodevelopmental disorders to be hospitalized with COVID-19, according to data on 43,465 children under the age of 18. However, the frequency of severe illness was lower among children hospitalized for COVID-19 with neurodevelopmental disorders than among children with other conditions.²¹

Information on influenza immunization can be utilized to anticipate possible obstacles to COVID-19 vaccination in kids with developmental disabilities. Even though vaccination rates among children with developmental disabilities are consistently low, many of

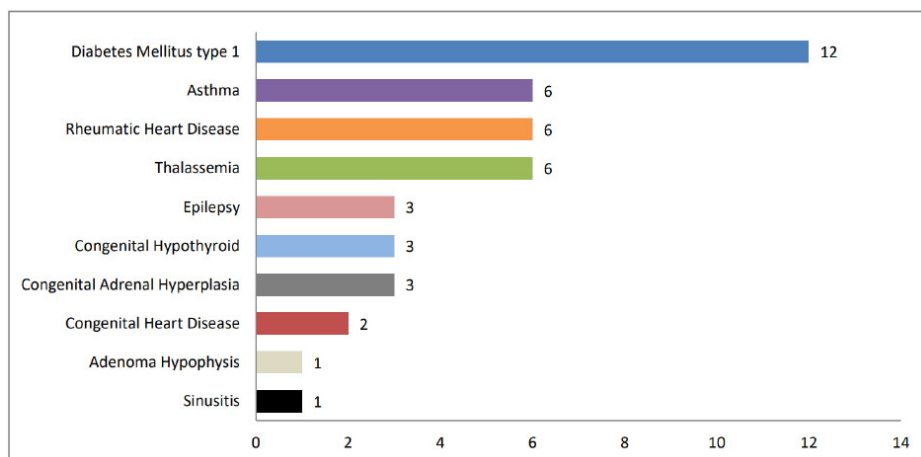


Figure 2. List of chronic diseases among adolescent patients in this study.

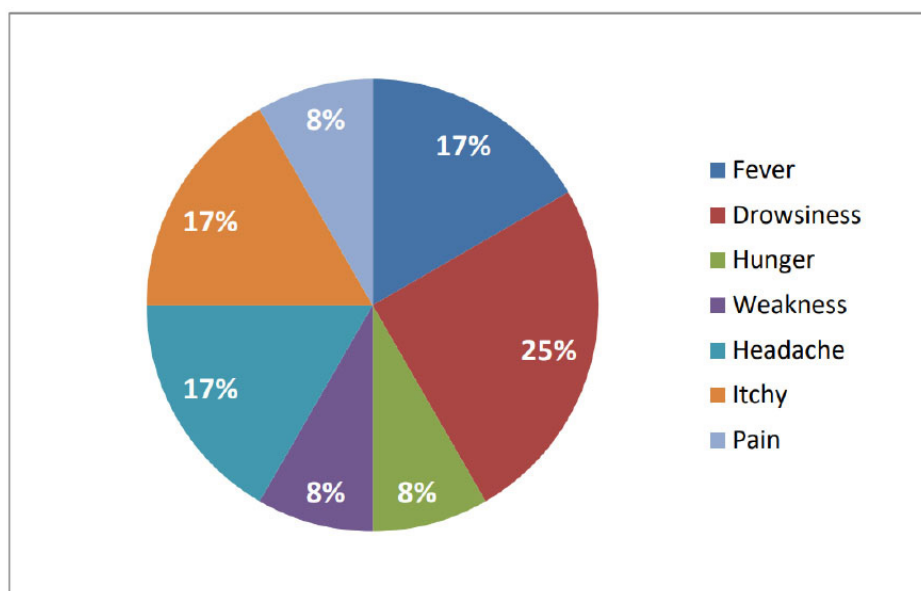


Figure 3. List of AEFI among adolescent patients in this study.

Table 2. Characteristics of patients with AEFI

Number	Gender	Age	Comorbid	AEFI
Patient 1	Female	14	Type 1 diabetes mellitus	Drowsiness, hunger, and pain on injection site
Patient 2	Female	18	Type 1 diabetes mellitus	Headache, weakness
Patient 3	Male	14	Type 1 diabetes mellitus, obesity	Headache
Patient 4	Male	15	Thalassemia	Drowsiness, fever, itchiness
Patient 5	Male	13	Thalassemia	Itchiness
Patient 6	Female	13	Down Syndrome, obesity	Drowsiness
Patient 7	Male	16	Down Syndrome	Fever for 3 days

them are thought to be at high risk for influenza complications.^{22,23} These below-average vaccination rates could be caused by vaccine hesitancy, access issues, or a lack of awareness of the higher risk for serious consequences.

To overcome access and hesitancy issues, pediatricians can collaborate with other providers to customize COVID-19 vaccination efforts for children with developmental disabilities. Compared to general pediatricians, children with developmental disabilities might interact with health care or other service specialists more frequently. Successful vaccination implementation will depend on cooperation between pediatric hospital systems, pediatric specialists, practices and clinics that cater to people with disabilities, and occupational, physical, or speech therapists who are aware of the unique needs of the children with developmental disabilities in their community.

The primary study limitation is that, because of the small sample size and short study duration, we could not provide comprehensive data on the COVID-19 vaccination coverage in Indonesia. More research is required to determine the vaccination coverage and vaccine safety for adolescents with chronic illnesses or disabilities. This will lessen the morbidity and death of Indonesian pediatric COVID-19 patients and help prevent COVID-19 breaks during the pandemic era.

CONCLUSION

Our study suggests the COVID-19 vaccine is safe for adolescents with disabilities and chronic diseases without significant side effects.

ETHICAL CLEARANCE

This study was reviewed and approved by the Ethical Committee of the Faculty of Medicine Universitas Indonesia (S-72/UN2.F1/ETIK/PPM.00.02/2021).

AUTHOR CONTRIBUTION

All authors contributed equally to this study.

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CONFLICT OF INTEREST

None of the authors have a conflict of interest to disclose.

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