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Editorial

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Child Malnutrition during the COVID-19 Pandemic in Indonesia

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Malnutrition is a worldwide health concern. Even before the COVID-19 pandemic, low-income and lower-middle-income countries (LMICs) faced severe challenges in ensuring that all children had access to adequate nutrition. The situation worsened during the pandemic. The Global Burden of Disease Study classifies malnutrition based on four variables: mortality rates based on child growth failure, years lived with disability based on iron status, vitamin A deficiencies, and high body mass index (BMI) [1]. Globally, 15% of children were estimated to be malnourished due to the pandemic.

Malnutrition can also increase the risk of being infected by the severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) [2]. Children with a history of malnutrition had high odds of severe COVID-19 and were even higher in the adult group (log-odds and 95% confidence interval: 0.094 [0.012, 0.175]) and (−0.014 [−0.021, −0.006]) in children aged 6–17 years and adults, respectively [3].

In Indonesia, the pre-pandemic stunting rate was 29.9% in children under two years old [4]. The prevalence rates of wasting and underweight were 11.7% and 15.2%, respectively. Malnutrition is caused by various factors, including economic vulnerability, restricting the access to an adequately nutritious diet and health services. In June 2020, UNICEF announced that the number of malnourished children in Indonesia would rise due to the pandemic unless interventions were made [5]. Job losses, layoffs, and a lack of financial resources within the family increase the vulnerability of the poor to food shortages. In addition, travel restrictions and partial community lockdowns tend to increase the consumption of empty-calorie foods, which lack protein, fiber, vitamins, and minerals [5]. A study in China indicated a shift in food patterns among the young during the pandemic. A significant reduction was observed in the intake of rice, meat, poultry, dairy products, vegetables, fruits, and soybean products during this pandemic [6].

Similar to other LMICs, COVID-19 also impacted the delivery of health services in Indonesia. Primary health care centers mainly provide antenatal care and nutritional services to the community. More than a quarter of primary health centers across 34 provinces delivered less than half or no nutrition services during the pandemic because of the infected cases among health workers and human resources management for the COVID-19 response [7]. Meanwhile, a study in five Indonesian districts showed that movement restrictions led to the procrastination of child health services in integrated healthcare posts (*Posyandu*) [8].

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Number of children who receive primary vaccines, regular weighing, and nutritional services has significantly reduced [8]. For example, only one in four households with children under five years had access to immunization services in April 2020 [5]. The main reasons for not seeking healthcare were reluctance to be infected with COVID-19 (83.1%), distance to healthcare facilities (22%), and lack of money (19.8%) [5]. As a result, more children are becoming undernourished, increasing the risk of infection and vulnerability to COVID-19.

Conversely, the pandemic could increase another type of malnutrition in children—obesity. Obesity in children is a chronic disease that is differentiated into three categories: overweight (85th–94th percentiles), obesity (95th–98th percentiles), and severe obesity (≥99th percentile) [9]. Closure of schools and restrictions on going out and socializing resulted in a deficit in physical activity, thereby increasing the risk of obesity. In addition, stay-at-home restrictions resulted in an unbalanced diet, dense energy, and high-fat intake [9]. A study on obese Italian children and adolescents indicated that potato chips, sugary drinks, red meat, sleep time, and screen time increased during the national pandemic lockdown. In contrast, the time spent on sports activities has decreased [10].

Economic difficulties during the COVID-19 pandemic may increase food insecurity in a population, particularly in low-income households. A national survey in Indonesia indicated that 75.3% of families with children experienced an income reduction in 2020, while 12.6% experienced moderate-to-severe food insecurity [5].

Increased dietary intake is a way to cope with isolation-induced boredom during social distancing and quarantine [6]. Excessive modern dietary intake was prevalent among children in urban and rural areas, where the main daily activities were operating digital devices, watching television, and sitting. The lockdown resulted in a reluctance to engage in sports and decreased physical activity, while the intake was excessive to compensate for the boredom. Meanwhile, obesity increases the risk of hospitalization and admission to the intensive care unit (ICU). Those with a high BMI of >35 kg/m^2 were at high risk of requiring mechanical ventilation [11]. Accordingly, weight management should be another priority assuming that obesity is often a problem in LMICs [12].

Although obesity indicates excessive energy intake, micronutrient deficiencies may also occur. Micronutrient deficiencies are common across countries that are prone to infection. A low intake of animal-sourced foods and a lower variety of diets causes a shortage of micronutrients [13]. The vegetable-based diet provides fewer essential micronutrients and is dominant within society in LMICs [14]. The high prevalence of anemia is caused by chronic deficiency of several micronutrients, including iron (Fe), folic acid (B_9), cobalamine (B_{12}), vitamin A, and vitamin C. Pre-existing anemia increases the severity of COVID-19 by causing high levels of inflammatory indicators [15]. In Indonesia, the prevalence of anemia in young children is high and remains a public health problem. In the 0–5, 5–14, and 14–124 years age groups, prevalence of anemia was 38.5%, 26.8%, and 32%, respectively [4]. Restoring an adequate amount of micronutrients would help to prevent severe infections. Micronutrient deficiencies might increase the risk of infection because of the role of micronutrients in helping to guard against viral infection.

Malnutrition, undernutrition, and overnutrition increase the risk of viral infection. A systematic review and meta-analysis of 32 studies found that children aged <14 years had a lower chance of having a secondary infection with SARS-CoV-2 than adults aged ≥20 years

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[16]. The manifestation of COVID-19 in children was similar to that in adults. Although mortality in children was lower than that in adults, children were at risk of receiving supportive therapy if they were infected. The viral load in children can be high, even in asymptomatic cases. UNICEF reported 35,018 active cases and 202 deaths in children below 18 years of age worldwide. Of these, children made up 10.4% of cases and 1.7% of deaths as of October 12, 2020 [8]. According to data recorded by the Indonesian COVID-19 National Task Force as of August 22, 2021, 12.9% of children 0-18 years were among those who tested positive for COVID-19, and children 0-18 years accounted for 1% of all COVID-19 deaths [17].

The severity of multisystem inflammatory syndrome in children due to COVID-19 and admission to the ICU is determined by low lymphocyte counts and high inflammation [18]. A systematic review of 39 studies of 662 pediatric patients concluded that fever, abdominal pain, diarrhea, and vomiting were the most common clinical signs and symptoms of COVID-19 among children in the ICU [19]. The United Kingdom cohort study among 1,734 children aged 5–17 reported that the COVID-19 duration was usually short and indicated fatigue, headache, and anosmia within six days. However, some children experienced prolonged illness durations, equal to or more than 56 days of symptoms [20].

It is necessary to formulate appropriate programs during this pandemic to encourage physical exercise to help prevent COVID-19 infection and ensure good physical health [21]. Furthermore, massive nutrition education programs are needed that use digital platforms to increase coverage, campaign for the program, and monitor its growth [7]. Authorities should continue to promote nutritional intake to preserve immunity and health. Mobile clinics are one possible approach to providing these services, especially to compensate for missed vaccination programs, growth monitoring, and nutrition counseling for children under five years of age during the pandemic. Other helpful initiatives could include enhancing public awareness to engage in sanitary behavior changes, such as promoting handwashing and disseminating nutrition-related messages to communities. While the Indonesian government has provided social assistance for food programs among low-income families, this should be accompanied by health promotion activities that highlight nutritious foods and an active lifestyle [8]. The vaccination program for children has been investigated since person-to-person transmission in children is poorly understood, and the effectiveness of a COVID-19 vaccine remains unknown [22]. The Indonesian government approved children's vaccinations in early November 2021, intending to reach 26.5 million children.

This pandemic has provided an opportunity to promote a healthy and balanced diet in Indonesian society. The monitoring, evaluation, and enhancement of existing programs should be oriented towards this goal. Another possible preventive effort would be to prevent and treat COVID-19 by relying on the immune system. All requires a coordinated action by multiple stakeholders and should be a priority during this pandemic.

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