Trends in Nutritional Status and Physical Fitness Among Preschool Children in Indonesia: Analysis of SDKI, SSGI, and Riskesdas Data 2020–2024

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Abstract. Preschool children (ages 3–6) are in a critical phase of growth and development, during which nutritional intake and physical activity are key factors in supporting optimal development. This study aims to analyze trends in the nutritional status and physical fitness of preschool children in Indonesia, using data from the SDKI, SSGI, and Riskesdas from 2020 to 2024. Key parameters considered include stunting, wasting, overweight, physical activity duration (less than 60 minutes), dietary intake (sugar-rich foods), and ARI prevalence. The analysis reveals that stunting prevalence declined from 27.7% to 20.9%, although overweight conditions have increased in urban areas. Physical activity and healthy food consumption remain problematic. Therefore, community-level interventions, particularly through early childhood education and child health services, are needed to promote nutrition and physical activity from an early age.

Keywords: [Preschool children, stunting, physical activity, overweight, nutrition, Riskesdas**]**

INTRODUCTION

The preschool years represent a critical phase in a child's development, particularly in terms of physical growth and the formation of long-term healthy habits. In addition to adequate nutrition, physical activity plays a vital role in supporting cognitive development, strengthening the immune system, and preparing children for future academic success (Senol, 2021). Physical movement such as active play, jumping, running, and dancing, directly contributes to the development of gross motor skills and body coordination, which are essential for readiness in primary education. Early childhood, especially the preschool age range (3–6 years), is a golden period of development. This period not only determines physical growth but also lays the foundation for long-term healthy lifestyle behaviors (WHO, 2020; Senol, 2021). Therefore, fulfilling nutritional needs and ensuring adequate physical activity are crucial to prevent permanent growth and developmental disorders (UNICEF Indonesia, 2023).

Indonesia has made significant progress in reducing stunting rates. According to data from SSGI and Riskesdas, the national prevalence of stunting dropped from 27.7% in 2020 to 21.5% in 2023, and even further to 20.9% in 2024 (Ministry of Health RI, 2023). This decline indicates the effectiveness of various government interventions such as nutrition education, supplementary feeding programs, and national stunting prevention campaigns (National Nutrition Agency, 2023). However, this progress is overshadowed by new challenges in the form of increasing cases of overweight and obesity among young children, particularly in urban areas. This phenomenon is an early sign of the so-called "double burden of malnutrition," where undernutrition and overnutrition coexist within the same population (UNICEF, 2023; Sambo et al., 2024).

One of the main causes of the increasing incidence of overweight is low levels of daily physical activity among children. Riskesdas 2023 data show that about 44% of preschool children in urban areas do not achieve the recommended 60 minutes of daily physical activity (Ministry of Health RI, 2023). This situation is exacerbated by sedentary lifestyles, increased screen time, and a lack of safe play spaces in residential environments (Wulandari, P., Marniati, M., & Silvia, M. P., 2025). Inadequate consumption of fruits and vegetables further worsens the situation. Only around 36% of preschoolers meet the daily fruit and vegetable intake recommended by the Ministry of Health (Riskesdas, 2023). Low fiber intake and high consumption of processed foods increase the risk of early-onset obesity and metabolic disorders (Andini, T. N., Badriyah, L. U., & Rizqi, R. I., 2024). On the other hand, the involvement of early childhood education (PAUD) institutions in promoting physical activity and nutrition education remains limited. Some studies report that inadequate teacher training, packed

curricula, and a lack of physical facilities are key barriers to establishing a supportive environment for consistent child physical activity (Saamong et al., 2025; Augustsson et al., 2024).

Considering the complexity of these issues, it is important to conduct a comprehensive study on trends in nutritional status and physical fitness among preschool children. This study aims to identify patterns of change in nutritional and physical health indicators over the 2020–2024 period using national data and to provide comprehensive policy recommendations.

METHODS

This study employed a descriptive quantitative approach using time-series trend analysis to observe changes in nutritional status and physical fitness indicators among preschool-aged children over the past five years. The data were sourced from three official national surveys managed by government institutions: the Indonesia Demographic and Health Survey (SDKI), the Basic Health Research (Riskesdas), and the Indonesian Nutrition Status Survey (SSGI). These three surveys were selected due to their national coverage, standardized methodology, and representative data on early childhood populations in Indonesia (Ministry of Health RI, 2023; BPS & BKKBN, 2022). The use of secondary data from these sources enabled researchers to observe longitudinal patterns and make reliable year-to-year comparisons (Ministry of Health RI, 2021).

The study population included children aged 36 to 71 months (3–6 years) across all provinces in Indonesia. This age group was chosen as it represents a critical transition period toward formal schooling, during which nutrition and physical activity habits have a strong influence on school readiness and cognitive development (WHO, 2020; Permatadewi et al., 2023). The key variables examined in this study include three main nutritional status indicators: stunting (height-for-age), wasting (weight-for-height), and overweight (BMI-for-age). Additionally, physical fitness was analyzed using proxy indicators such as daily physical activity duration (less than 60 minutes), fruit and vegetable consumption, and the prevalence of Acute Respiratory Infections (ARI) as a reflection of children's immune health (UNICEF, 2023; Renyoet, B. S., Mebang, R. S., & de Fretes, F., 2024).

The data were analyzed descriptively by presenting distribution tables and annual trend charts to illustrate the development of each indicator from 2020 to 2024. This method aimed to identify changing patterns and potential shifts in nutritional issues from undernutrition to overnutrition. In addition to statistical analysis, a systematic literature review was conducted using relevant national and international journal articles. The literature included was published within the last five years (2020–2025), focusing on topics such as physical activity in early childhood, early childhood educators' perceptions of active movement, and the relationships between nutritional status, motor skills, and cognitive development (Saamong et al., 2025; Fan et al., 2024). This combined approach enabled the researchers not only to present quantitative trends but also to provide contextual interpretations of findings based on existing literature

RESULTS AND DISCUSSION

The analysis of national trend data indicates that the prevalence of stunting among preschool children has decreased significantly—from 27.7% in 2020 to 20.9% in 2024. This decline reflects the success of various nutritional intervention programs implemented by both national and local governments, such as the Balanced Nutrition Program, Supplementary Feeding (PMT), the "First 1000 Days of Life" campaign, and routine nutritional screening at primary healthcare facilities (Ministry of Health RI, 2023). A study by Rosiska, M., Putra, Y. A., & Sintia, R. (2025) also found that the Java and Sumatra regions achieved faster stunting reduction compared to eastern Indonesia, largely due to the synergy between the health, education, and village governance sectors.

In contrast, the prevalence of wasting, or acute malnutrition, among preschoolers has remained relatively stable, ranging between 7.4% and 6.2% from 2020 to 2024. Although a slight decline occurred, this figure still indicates that acute undernutrition remains a concern—especially in eastern and remote rural areas of Indonesia where access to food, clean water, and basic health services is limited (UNICEF Indonesia, 2023; Riskesdas, 2023). This is supported by findings from Andini, T. N., Badriyah, L. U., & Rizqi, R. I. (2024), which show that wasting is closely associated with recurrent infections and poor sanitation. On the other hand, there has been a notable increase in overweight cases

among preschool children, particularly in urban areas. The prevalence of overweight rose from 3.5% in 2020 to 5.2% in 2024, indicating a shift in the nutritional burden from undernutrition to overnutrition (Sambo et al., 2024). Contributing factors include increased consumption of processed foods, prolonged screen time, and low levels of daily physical activity. A study by Wulandari, P., Marniati, M., & Silvia, M. P. (2025) showed that children engaging in less than one hour of daily physical activity are 1.7 times more likely to become overweight than their more active peers.

Daily physical activity among children also shows a concerning trend. The proportion of preschoolers engaging in less than 60 minutes of physical activity per day has increased steadily, especially in major cities like Jakarta, Medan, and Surabaya. According to Riskesdas 2023, 44% of urban preschoolers do not meet the WHO's recommended daily physical activity guidelines (WHO, 2020). Factors contributing to this trend include limited child-friendly open spaces, a lack of physical activity programs in early childhood education (PAUD), and the growing use of digital devices from an early age (Saamong et al., 2025).

In terms of dietary patterns, only about 36% of preschool children meet the recommended daily intake of fruits and vegetables based on balanced nutrition guidelines (Riskesdas, 2023). This low intake is closely linked to high consumption of fast food and sugary beverages, as well as a lack of nutrition education at home and in schools. Andini, T. N., Badriyah, L. U., & Rizqi, R. I. (2024) emphasize that insufficient fiber intake and excessive consumption of saturated fats increase the risk of obesity and weaken children's immune systems.

The prevalence of Acute Respiratory Infections (ARI) among preschoolers has remained relatively stable at 18–19% over the past five years. However, the literature shows that children with poor nutrition and low physical activity levels are more susceptible to ARI due to weakened immunity (Maulida, Y., Yanti, R., Aprianti, A., & Fathurrahman, F., 2022). This highlights the close relationship between physical fitness and immune health, indicating that prevention strategies must go beyond treatment and include early nutrition education and physical activity promotion.

Overall, the combination of quantitative data and literature review reveals that while stunting reduction programs have shown positive results, issues of physical fitness and overweight remain insufficiently addressed in national initiatives. The lack of integration between nutrition policies and physical activity promotion in PAUD and home settings remains a critical gap. Therefore, a cross-sectoral approach is urgently needed, one that integrates family nutrition education, active curriculum design in PAUD, and supportive infrastructure for healthy play environments to prevent a generation burdened by double malnutrition (Fan et al., 2024).

CONCLUSION

This study demonstrates that Indonesia has successfully reduced the national stunting rate over the past five years. However, the rise in overweight cases and low physical activity levels among preschool children presents a new challenge that must be addressed urgently. Therefore, a holistic approach is needed, one that integrates nutrition programs, health education, and physical activity promotion within early childhood education settings (PAUD). Collaboration among local governments, educators, and parents is essential to create an environment that supports the optimal development of children physically, cognitively, and socially.

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