International Journal of Public Health
Volume. 2, Nomor. 1, Tahun 2025
e-ISSN : 3047-5228; dan p-ISSN : 3047-5236; Page. 107-114
DOI: https://doi.org/10.62951/ijph.v2i1.335
Available online at: https://international.arikesi.or.id/index.php/IJoPH

Association Between Nutritional Status and Gross Motor Skills Development in Children Aged 1-3 Years at Posyandu in Situ Udik Health Center Area

Triswanti[1*], Nurul Herawati[2], Intan Sari Mawar Indah[3]
[1,2] Midwifery Diploma Three Program, Bandung Academy of Midwifery, Indonesia
[3] Situ Udik Public Health Center, Bogor, Indonesia
puitriswanti@gmail.com [1*], nurulhrwt14@gmail.com [2], muse_intan@gmail.com [3]

Address: Jl. Garuda No.79-83, Dungus Cariang, Andir District, Bandung City, West Java 40184
Author correspondence: puitriswanti@gmail.com

Abstract: *Gross motor development in children aged 1–3 years is a crucial aspect of growth and development, influenced by various factors, one of which is nutritional status. Good nutritional status plays a role in optimizing children's growth and development, including gross motor skills. This study aims to analyze the relationship between nutritional status and gross motor development in children aged 1–3 years at the Posyandu within the working area of Situ Udik Community Health Center (Puskesmas). This study employs a quantitative design with a cross-sectional approach. The research sample consists of children aged 1–3 years selected using a random sampling technique. Nutritional status was measured using an anthropometric approach, specifically weight-for-age (W/A), while gross motor development was assessed using the validated Denver Development Screening Test (DDST II) observation sheet. Data analysis was conducted using the chi-square statistical test to determine the relationship between nutritional status and gross motor development. The results indicate a significant relationship between nutritional status and gross motor development in children aged 1–3 years (0.013, $p \leq 0.05$). Children with good nutritional status tend to have optimal gross motor development compared to those with undernutrition or overnutrition. These findings suggest that good nutritional status is a supporting factor in early childhood gross motor development. Therefore, regular monitoring of nutritional status and parental nutrition education are essential steps in supporting children's optimal growth and development.*

Keywords: *Nutritional status, gross motor development, children aged 1–3 years, Posyandu, Situ Udik Community Health Center (Puskesmas).*

1. INTRODUCTION

Gross motor development is a fundamental aspect of a child's growth and development, reflecting their ability to control overall body movements such as walking, running, jumping, and maintaining balance (Santrock, 2021). This development is influenced by various factors, including nutritional status. Good nutritional status supports muscle growth and the functioning of the nervous system, which play a crucial role in optimizing children's gross motor skills (Siegler et al., 2020). Conversely, undernutrition or overnutrition can lead to growth disorders and hinder the achievement of motor skills appropriate to a child's developmental stage (Black et al., 2017).

In Indonesia, nutritional problems among toddlers remain a public health issue. Data from the Indonesian Ministry of Health (2022) indicate that the prevalence of undernutrition and severe malnutrition in toddlers is still relatively high, which has implications for an increased risk of delayed motor development. Posyandu, as a primary healthcare facility, plays a role in monitoring children's nutritional status and development.

Received: January 17, 2025; Revised: January 31, 2025; Accepted: February 19, 2025; Online Available: February 22, 2025

However, research on the relationship between nutritional status and gross motor development at the community level remains limited, particularly among children aged 1–3 years. Situ Udik Community Health Center (Puskesmas) is one of the healthcare centers that oversees multiple Posyandu within its working area, serving as a facility for monitoring children's growth and development, including nutritional status and motor development. Suboptimal monitoring of nutritional status may lead to delays in the early detection of gross motor development disorders. Therefore, this study aims to analyze the relationship between nutritional status and gross motor development in children aged 1–3 years at Posyandu within the working area of Situ Udik Community Health Center.

The findings of this study are expected to contribute to improving child growth and development monitoring efforts and serve as a reference for healthcare professionals in implementing more effective nutritional interventions and motor stimulation strategies.

2. METHODS

Type of Research: This study employs a quantitative design with a cross-sectional approach. Research Location and Period: The study was conducted at Posyandu within the working area of Situ Udik Community Health Center from September to December 2024. Population and Sample: The population consisted of 160 children aged 1–3 years. A total of 114 children were selected as samples based on inclusion criteria using a random sampling technique. Data Collection: Data collection was conducted by measuring the nutritional status of children aged 1–3 years using an anthropometric approach, specifically weight-for-age (W/A) parameters. Gross motor development was assessed using the validated Denver Development Screening Test (DDST II) observation sheet. Data Analysis: Data were analyzed using the chi-square statistical test to determine the relationship between nutritional status and gross motor development.

3. RESULTS

Nutritional Status of Children Aged 1–3 Years

Table 1. Frequency Distribution of Nutritional Status in Children Aged 1–3 Years at Posyandu in the Working Area of Situ Udik Community Health Center

Nutritional Status	Number	Percentage (%)
Underweight	70	41,4
Normal	41	35,9
Overweight	3	2,6
Total	114	100

Table 1 on the nutritional status of children aged 1–3 years at Posyandu in the working area of Situ Udik Community Health Center shows that the majority of respondents fall into the underweight category, with a total of 70 children (61.4%).

Gross Motor Development in Children Aged 1–3 Years

Table 2. Frequency Distribution of Gross Motor Development in Children Aged 1–3 Years at Posyandu in the Working Area of Situ Udik Community Health Center

Gross Motor Development	Number	Percentage (%)
Normal	41	35,9
Suspected Delay	59	51,7
Cannot Be Tested	14	12,3
Total	114	100

Table 2 on gross motor development in children aged 1–3 years at Posyandu in the working area of Situ Udik Community Health Center shows that the majority of respondents fall into the suspected motor development delay category, with a total of 59 children (51.7%).

Relationship Between Nutritional Status and Gross Motor Development in Children Aged 1–3 Years at Posyandu in the Working Area of Situ Udik Community Health Center.

Table 3. Relationship Between Nutritional Status and Gross Motor Development in Children Aged 1–3 Years at Posyandu in the Working Area of Situ Udik Community Health Center

Nutritional Status	Gross Motor Development						Total		*P value*
	Normal		Suspected Delay		Cannot Be Tested				
	F	%	F	%	F	%	F	%	0,013
Underweight	22	53,6	39	66	9	64	70	100	
Normal	17	41,5	19	32	5	36	41	100	
Overweight	2	4.9	1	2	0	0	3	100	
Total	41	35,9	59	52	14	12	114	100	

Table 3 presents an analysis of the relationship between nutritional status and gross motor development in children aged 1–3 years at Posyandu in the working area of Situ Udik Community Health Center. Among the 114 respondents, 39 (66%) children with undernutrition experienced gross motor development delays (suspected delay).

Based on the chi-square (X^2) statistical test, the obtained P-value = $0.013 \leq 0.05$, indicating that Ha is accepted and H0 is rejected, which means there is a significant relationship between nutritional status and gross motor development in children aged 1–3 years at Posyandu in the working area of Situ Udik Community Health Center.

4. DISCUSSION

Nutritional Status

Nutritional status refers to the body's health condition resulting from nutrient intake through food and beverages, which is linked to the body's needs. The majority of children with good nutritional status exhibit gross motor development appropriate for their age. Conversely, children with undernutrition show delays in several aspects of motor development, such as balance, coordination, and muscle strength. This condition can be explained by the lack of essential nutrients, such as protein, iron, and essential fatty acids, which play a crucial role in muscle tissue formation and nervous system function (Black et al., 2017).

Several factors influence nutritional status, which can be categorized into direct causes, indirect causes, and underlying causes. There are two direct causes of malnutrition: inadequate nutrient intake and infectious diseases. Poor nutrient intake may result from limited food consumption or the consumption of food lacking essential nutrients. Meanwhile, infections can impair organ function, preventing the body from properly absorbing nutrients (Almaitser, 2019).

Indirect causes of malnutrition include insufficient food availability, inadequate caregiving practices, and poor sanitation, clean water access, and basic healthcare services. The underlying causes, or the root causes of malnutrition, include economic, political, and social crises, as well as natural disasters, which affect food availability, caregiving practices within families, and access to proper healthcare and sanitation. Ultimately, these factors influence the nutritional status of toddlers (Hartanto, 2021).

The researchers used a nutritional status classification based on the standard deviation unit, also known as the Z-score, to assess and monitor growth. The standard deviation used is based on weight-for-age (W/A). Given the fluctuating nature of body

weight, the W/A index better represents an individual's current nutritional status. Nutritional status assessment was conducted directly through anthropometric measurements using the weight-for-age (W/A) parameter.

Based on the research findings presented in Table 1, which shows the frequency distribution of nutritional status among children aged 1–3 years at Posyandu in the working area of Situ Udik Community Health Center, it was found that out of 114 respondents, 70 children (61.4%) were classified as undernourished, 41 children (35.9%) had good nutritional status, and 3 children (2.6%) were overweight. This study concludes that among 114 respondents, the majority of children aged 1–3 years at Posyandu in the working area of Situ Udik Community Health Center experienced undernutrition (61.4%). This condition is attributed to parents' lack of knowledge about nutrition, leading to an inability to provide proper nutritional intake for their children. Additionally, some children have difficulty eating and require encouragement from their parents. Furthermore, certain children suffered from influenza and diarrhea, which may have contributed to their poor nutritional status.

These findings align with research conducted by Purnamasari et al. (2020), which found that undernourished children tend to experience delayed motor development due to a lack of protein, iron, and essential fats, which play a crucial role in muscle formation and central nervous system function.

Gross Motor Development

Gross motor skills refer to motor abilities that require balance and coordination between body parts and large muscle groups, such as the arm and leg muscles. Factors influencing gross motor development can be categorized into three main groups: hereditary factors, environmental factors (which are further divided into: prenatal factors: mechanical environment, chemical substances or toxins, and hormonal influences; postnatal factors: cultural environment, socioeconomic status, nutritional status, climate and weather, physical activity or exercise, the child's position in the family, and health status), hormonal factors: Including somatotropin, thyroid hormones, and glucocorticoids (Hidayat, 2017).

The researchers used the Denver Developmental Screening Test (DDST) to observe children's gross motor development. The aspects assessed in DDST include obstacle course training, long jumping, and throwing and catching a large ball. Based on the research findings presented in table 2, which shows the frequency distribution of gross motor development among children aged 1–3 years at Posyandu in the working area of Situ Udik Community Health Center, it was found that out of 114 respondents : 41 children (35.9%)

had normal gross motor development, 59 children (51.7%) were classified as suspect (delayed motor development), and 14 children (12.3%) could not be tested for gross motor development.

This study concludes that among 114 respondents, the majority (51.7% or 59 children) experienced delayed gross motor development (suspect category). This condition is influenced by the family's socioeconomic status, which may have contributed to the children's gross motor development outcomes

relationship between socioeconomic status and gross motor development this study aligns with the theory that gross motor development can be influenced by socioeconomic status families from middle to lower economic backgrounds often lack the resources to support motor skill development, such as providing toys that facilitate gross motor activities or ensuring adequate nutritional intake, which is crucial for children's growth and development. On the other hand, families with higher socioeconomic status may introduce gadgets to children at an early age, leading to reduced physical stimulation as children tend to spend more time on screens rather than engaging in direct motor skill activities.

This finding is consistent with a study by Black et al. (2017), which revealed that families with low income tend to consume lower-quality foods, often deficient in protein, iron, and essential vitamins. This, in turn, increases the risk of malnutrition or stunting in toddlers, which may negatively impact their gross motor development.

The Relationship Between Nutritional Status and Gross Motor Development

Based on the statistical test results, a P-value of $0.013 \leq 0.05$ was obtained, indicating that Ha is accepted and H0 is rejected. This means that there is a significant relationship between nutritional status and gross motor development in children aged 1-3 years at the Posyandu in the Working Area of Puskesmas Situ Udik.

The study results indicate that 39 children (66%) with poor nutritional status experienced delayed gross motor development (suspected delay). The delay in gross motor development is caused by poor nutrition, which influenced the study outcomes.

This study aligns with the theory that nutritional status affects gross motor development in children, as children with poor nutritional status are more likely to experience gross motor delays (suspected delays). Families with low income tend to consume lower-quality food, which lacks adequate protein, iron, and vitamins. This condition increases the risk of malnutrition or stunting in toddlers.

5. CONCLUSION AND RECOMMENDATIONS

Based on the research findings and analysis, it can be concluded that nutritional status has a significant relationship with gross motor development in children aged 1-3 years. Children with good nutritional status tend to have more optimal gross motor development compared to those with poor or excessive nutrition.

Families with low income tend to consume lower-quality food, which lacks adequate protein, iron, and vitamins, increasing the risk of malnutrition or stunting in toddlers. Other factors, such as environmental stimulation, parenting styles, and access to healthcare facilities, also play a role in children's gross motor development.

Therefore, a holistic approach is needed in monitoring children's growth and development, considering nutritional aspects, motor stimulation, and a supportive environment.

REFERENCES

Almatsier, S. (2019). *Prinsip dasar ilmu gizi*. Jakarta: Gramedia Pustaka Utama.

Arikunto, S. (2018). *Prosedur penelitian: Suatu pendekatan praktik*. Jakarta: Rineka Cipta.

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., Ezzati, M., Grantham-McGregor, S., Katz, J., Martorell, R., & Uauy, R. (2017). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet, 382*(9890), 427–451.

Budijanto, D. (2018). Analisis prevalensi stunting di Indonesia berdasarkan data WHO dan PSG 2017. *Jurnal Gizi dan Kesehatan Masyarakat, 12*(2), 61-72.

Campos, C., Oliveira, R. S., Moreira, M., et al. (2019). Motor development and childhood obesity: A systematic review. *Journal of Physical Activity and Health, 16*(5), 322–333.

Depkes RI. (2016). *Pedoman gizi seimbang*. Jakarta: Kementerian Kesehatan RI.

Dewi, A., Putri, S., & Nugroho, P. (2021). The role of Posyandu in monitoring child development in rural areas. *Journal of Public Health Research, 10*(1), 45–53.

Gallahue, D. L., & Ozmun, J. C. (2017). *Understanding motor development: Infants, children, adolescents, adults* (7th ed.). New York: McGraw-Hill.

Gesell, A. (2002). *The first five years of life: A guide to the study of the preschool child*. New York: Harper & Row.

Hartanto, D., & Kodim, A. (2021). Pengaruh status gizi anak usia di bawah lima tahun terhadap nilai belajar verbal dan numerik. *Jurnal Kesehatan Masyarakat, 15*(3), 178-185.

Hidayat, A. A. (2017). *Ilmu kesehatan anak untuk keperawatan*. Jakarta: Salemba Medika.

Hurlock, E. B. (2016). *Perkembangan anak* (6th ed.). Jakarta: Erlangga.

Jurnal Akademka Baiturrahim Jambi. (2021). Status gizi anak usia 6-24 bulan dan perkembangannya. *Jurnal Akademka Baiturrahim Jambi (JABJ), 10*(2), 354-357.

Jurnal PAUDIA. (2021). Faktor-faktor yang mempengaruhi perkembangan motorik kasar anak usia dini. *PAUDIA: Jurnal Pendidikan Anak Usia Dini*, *10*(2), 219-227.

Kementerian Kesehatan RI. (2022). *Laporan status gizi balita di Indonesia 2022*. Jakarta: Kementerian Kesehatan RI.

Notoatmodjo, S. (2021). *Metodologi penelitian kesehatan*. Jakarta: Rineka Cipta.

Pusat Kajian dan Pengelola Jurnal FKM UMI. (2020). Hubungan pola pemberian ASI terhadap perkembangan motorik kasar pada bayi usia 6-11 bulan di Puskesmas Rappokalling Kota Makassar. *Window of Public Health Journal, 01*(04).

Rahayu, S., & Pratiwi, D. (2019). Malnutrisi dan perkembangan motorik anak: Studi kasus di beberapa Posyandu. *Jurnal Ilmu Kesehatan Masyarakat, 7*(2), 78-89.

Santrock, J. W. (2018). *Children* (13th ed.). New York: McGraw-Hill.

Santrock, J. W. (2021). *Child development* (14th ed.). New York: McGraw-Hill.

Saraswati, D., et al. (2020). Hubungan status gizi dengan perkembangan motorik anak usia dini di Indonesia. *Jurnal Gizi dan Kesehatan, 12*(3), 45-55.

Siegler, R. S., Eisenberg, N., DeLoache, J., Saffran, J., & Gershoff, E. (2020). *How children develop* (6th ed.). New York: Worth Publishers.

Suhartini, T., et al. (2021). Nutritional status and gross motor development in early childhood: A longitudinal study. *Indonesian Journal of Public Health, 10*(2), 112-125.

Sunarti, E. (2020). *Perkembangan anak: Teori dan praktik*. Yogyakarta: Pustaka Pelajar.

Supariasa, I. D. N. (2017). *Penilaian status gizi*. Jakarta: EGC.

Walker, S. P., Wachs, T. D., Gardner, J. M., et al. (2011). Child development: Risk factors for adverse outcomes in developing countries. *The Lancet, 378*(9799), 1325–1338.

WHO. (2021). *Child growth and development*. Geneva: World Health Organization.