

THE RELATIONSHIP OF UNDERNUTRITION AND GROSS MOTOR DEVELOPMENT OF CHILDREN AGED 1-5 YEARS

Sivana Gian Reghita¹, Efa Septiana^{2*}, Weda Ayu Ardini³

^{1,2,3}Prodi DIII Kebidanan Akademi Kebidanan Wahana Husada Bandar Jaya
Korespondensi Email : efaseptiana573@gmail.com

ABSTRAK : HUBUNGAN GIZI KURANG DENGAN PERKEMBANGAN MOTORIK KASAR ANAK USIA 1-5 TAHUN DI WILAAH KERJA PUSKESMAS KESUMADADI LAMPUNG TENGAN

Latar Belakang: Kekurangan gizi dapat memberikan konsekuensi buruk dimana manifestasi terburuk dapat menyebabkan kematian. Masalah gizi kurang nampaknya belum dapat teratasi dengan baik skala internasional. Secara global sebesar 462 juta balita yang mengalami gizi kurang dan 1,9 juta anak mengalami gizi lebih (WHO, Malnutrition, 2020). Angka kematian balita menurut UNICEF sebanyak 37% balita (Unicef, 2021). Angka Gizi kurang di Indonesia juga masih sebanyak sebanyak (17%) (Kemenkes RI, 2022). Menurut laporan Badan Pusat Statistik (BPS), Indonesia memiliki angka kematian balita 19,83 per 100 kelahiran hidup pada 2022 (BPS, 2022). Artinya, dari setiap 100 anak yang lahir dengan selamat, sekitar 19 anak di antaranya meninggal sebelum mencapai usia 5 tahun. Kematian balita salah satunya disebabkan pneumonia (BPS, 2022). Salah satu provinsi di Indonesia yang menghadapi masalah malnutrisi adalah Provinsi Lampung, yaitu untuk kasus gizi kurang berada diperingkat 26 (14,8%) (KemenkesRI, 2022). Kasus gizi kurang belum mencapai target diLampung Timur yaitu 16,7%. Sedangkan prevalensi gizi kurang sebanyak 16,7%. (Kemenkes RI, 2022). Angka Kematian Balita di Provinsi Lampung sebanyak 15,6%. Provinsi Lampung terdapat 15 kabupaten atau kota, salah satunya yaitu kabupaten Lampung Timur. Sebanyak 16,26% angka kematian balita di Lampung Timur (BPS, 2020).

Tujuan: Mengetahui ada hubungan gizi kurang dengan perkembangan motorik kasa anak usia 1-5 tahun di Wilayah Kerja Puskesmas Kesumadadi Lampung Tengah Tahu 2023

Metode: Desain penelitian dari penelitian ini menggunakan metode survei analitik penelitian dilaksanakan di Wilayah Kerja Puskesmas Kesumadadi Lampung Tengah. Rancangan penelitian yang digunakan yaitu penelitian *case control*. Populasi pada penelitian ini adalah data gizi kurang yaitu sejumlah 245 balita dari desa kesumadadi dan 212 balita dari desa sumberjo yang didapatkan dari EPGBM Puskesmas Kesumadadi Lampung Tengah Tahun 2023. Sampel pada penelitian ini menggunakan teknik *purposive sampling* yang dihitung menggunakan rumus slovin dengan hasil 82 balita didesa Kesumadadi dan desa Sumberjo. Instrumen penelitian ini menggunakan lembar observasi dan lembar denver II. Analisis data menggunakan analisis univariat dan bivariat menggunakan *Chi Square*.

Hasil: Hasil penelitian telah dilakukan analisis univariat yaitu distribusi frekuensi gizi kurang 30 (37%) dan tidak gizi kurang 52 (63%). Distribusi frekuensi motorik kasar status normal sejumlah 51(62%), Suspek 28 (34%), Tidak dapat diuji 3 (4%). Hasil analisis bivariat telah dilakukan analisis data menggunakan *chi square* didapatkan hasil dari penelitian ini yaitu didapatkan balita yang motorik kasarnya normal terdapat 51 (98%) balita yang tidak gizi kurang, balita yang motoik kasarnya suspek terdapat 27 (90%) balita ber status gizi kurang dan 1 (2%) balita yang status gizi nya baik. Balita yang motorik kasarnya tidak dapat diuji terdapat 3 (10%) balita yang status gizi kurang. Hasil *chi square* yang didapat yaitu $0,000 < 0,005$ yang artinya ada hubungan antara motorik kasar dengan status gizi pada balita.

Kesimpulan: Balita yang motorik kasarnya tidak dapat diuji terdapat 3 (10%) balita yang status gizi kurang. Hasil *chi square* yang didapat yaitu $0,000 < 0,005$ yang artinya ada hubungan antara motorik kasar dengan status gizi pada balita.

Saran: Dapat dilakukan pencegahan gizi kurang agar seluruh balita memiliki status gizi baik dan motorik kasar normal

Kata Kunci : *Case Control*, Gizi Kurang, Motorik Kasar

ABSTRACT

Background: Malnutrition can have bad consequences where the worst manifestation can cause death. It seems that the problem of malnutrition has not been resolved well on an international scale. Globally, 462 million children under five are undernourished and 1.9 million children are overnourished (WHO, Malnutrition, 2020).

According to UNICEF, the under-five mortality rate is 37% (Unicef, 2021). The malnutrition rate in Indonesia is still as high as (17%) (RI Ministry of Health, 2022). According to the Central Statistics Agency (BPS) report, Indonesia has a toddler mortality rate of 19.83 per 100 live births in 2022 (BPS, 2022). This means that for every 100 children born safely, around 19 children die before reaching the age of 5 years. One of the deaths of children under five is caused by pneumonia (BPS, 2022). One of the provinces in Indonesia that faces malnutrition problems is Lampung Province, which is ranked 26th (14.8%) for cases of malnutrition (Kemenkes RI, 2022). Malnutrition cases have not yet reached the target in East Lampung, namely 16.7%. Meanwhile, the prevalence of undernutrition is 16.7%. (RI Ministry of Health, 2022). The infant mortality rate in Lampung Province is 15.6%. Lampung Province has 15 districts or cities, one of which is East Lampung district. As much as 16.26% of the under-five mortality rate in East Lampung (BPS, 2020).

Objective: To find out whether there is a relationship between malnutrition and the development of fine motor skills in children aged 1-5 years in the Kesumadadi Community Health Center Working Area, Central Lampung, 2023

Method: The research design of this study uses an analytical survey method, research carried out in the Kesumadadi Community Health Center Work Area, Central Lampung. The research design used is case control research. The population in this study was malnutrition data, namely 245 toddlers from Kesumadadi village and 212 toddlers from Sumberjo village obtained from the EPGBM of the Kesumadadi Health Center, Central Lampung in 2023. The sample in this study used a purposive sampling technique which was calculated using the Slovin formula with the results being 82 toddlers in the village. Kesumadadi and Sumberjo villages. This research instrument uses observation sheets and Denver II sheets. Data analysis used univariate and bivariate analysis using Chi Square.

Results: The results of the research were carried out by univariate analysis, namely the frequency distribution of malnutrition was 30 (37%) and not malnutrition was 52 (63%). Frequency distribution of normal gross motor status was 51 (62%), Suspect 28 (34%), Untestable 3 (4%). The results of bivariate analysis have carried out data analysis using chi square. The results of this research are that there are 51 (98%) toddlers whose gross motor skills are normal, and 27 (90%) toddlers whose gross motor skills are suspect are undernourished. and 1 (2%) toddler whose nutritional status was good. Of the toddlers whose gross motor skills could not be tested, there were 3 (10%) toddlers who had poor nutritional status. The chi square results obtained were $0.000 < 0.005$, which means there is a relationship between gross motor skills and nutritional status in toddlers.

Conclusion: Of the toddlers whose gross motor skills could not be tested, there were 3 (10%) toddlers who had poor nutritional status. The chi square results obtained were $0.000 < 0.005$, which means there is a relationship between gross motor skills and nutritional status in toddlers.

Suggestion: Malnutrition can be prevented so that all toddlers have good nutritional status and normal gross motor skills.

Keywords: : Case Control, Lack Of Nutrition, Rough Motorcycle

INTRODUCTION

Malnutrition can have bad consequences where the worst manifestation can cause death. It seems that the problem of malnutrition has not been resolved well on an international scale. Globally, 462 million children under five are undernourished and 1.9 million children are overnourished (WHO, Malnutrition, 2020). According to UNICEF, the under-five mortality rate is 37% (Unicef, 2021). The malnutrition rate in Indonesia is still as high as (17%) (RI Ministry of Health, 2022). According to the Central Statistics Agency (BPS) report, Indonesia has a toddler mortality rate of 19.83 per 100 live births in 2022 (BPS, 2022). This means that for every 100 children born safely, around 19 children die before reaching the age of 5 years. One of the deaths of children under five is caused by pneumonia (BPS, 2022). One of the provinces in Indonesia that faces malnutrition problems is Lampung Province, which is

ranked 26th (14.8%) for cases of malnutrition (Kemenkes RI, 2022). Malnutrition cases have not yet reached the target in East Lampung, namely 16.7%. Meanwhile, the prevalence of undernutrition is 16.7%. (RI Ministry of Health, 2022). The infant mortality rate in Lampung Province is 15.6%. Lampung Province has 15 districts or cities, one of which is East Lampung district. As much as 16.26% of the under-five mortality rate in East Lampung (BPS, 2020).

The most common cause of infant death is pneumonia, while pneumonia is the impact of malnutrition caused by malnutrition (Purnama et al., 2021). Apart from pneumonia, malnutrition has an impact on children's slow development, which indicates the amount of nutritional intake they receive. Malnutrition is a state of subacute or chronic nutrition, where the combination of various levels of malnutrition and inflammatory activity has caused

changes in body composition and reduced organ function. Nutritional and health disorders during this period can negatively affect children's physical (motor development) and cognitive development (Worku et al., 2018). Good nutritional status is largely determined by the food consumed which has sufficient nutritional content and is adjusted to the nutritional needs of toddlers, so that children can grow and develop normally, healthy and strong. Fulfillment of nutrition for children under five is a factor that must be considered, because the development period that is vulnerable to nutrition is during the toddler years (Jasmawati and Rizky, 2020).

Poor nutritional status results in slow child development, which indicates that the amount of nutritional intake obtained does not meet the nutritional needs received by the body, especially the brain, as a result it will disrupt the child's development. Gross motor skills require good brain and muscle performance, therefore children need good nutritional intake. Wauran et al in (Dewi, Inggit, Ani & Psiari 2022). Growth and development according to general stages. Growth is an increase in the size and number of cells and intracellular tissue, so that there is an increase in physical size and body structure. Development is the increase in more complex body functions so that children have gross motor skills, fine motor skills, speaking language, as well as socialization and independence. This process must be monitored carefully because each child has stages of ability that must be mastered at a certain age limit. This monitoring is part of supervising the growth and development of toddlers. Monitoring children's growth and development needs to be carried out by several parties such as parents, health workers, educators and cadres (Anggari, 2021).

A child's gross motor development can be assessed by moving their arms and body (Fitri, 2021). According to research (Arsida, Sitti, Puput, 2021) with results from 13 children with poor nutritional status, it was found that 2 children had appropriate gross motor development while 10 children were doubtful. The results of the Spearman rank test obtained a significance value of $p = 0.000$, this shows that there is a relationship between nutritional status and the development of gross motor skills in children aged 1-3 years. According to research with the results of data analysis, the relationship between good and poor nutritional status and motor development was found to be 0.001, which means there is a significant relationship between good and poor nutritional status and children's motor development.

Previous research in assessment categories used appropriate and undecided categories. Meanwhile, this research uses normal, suspect and untested categories.

After conducting a preliminary study, looking at the EPBGM data at the Kesumadadi Community Health Center, it was found that there were 457 children under five. A total of 427 (93.4%) toddlers were well-nourished and had good gross motor skills. Researchers will examine two villages where there are malnourished toddlers, namely Kesumadadi village with 11 children experiencing malnutrition, and in Sumberjo village 19 children experiencing malnutrition. In general, the child's motoric development is not being able to grip well and not being able to kick the ball well according to his age. Therefore, the researchers studied research regarding "The Relationship between Malnutrition and Gross Motor Development of Children Aged 1-5 Years in the Kesumadadi Community Health Center Area, Central Lampung in 2024".

RESEARCH METHODS

The research design of this study uses an analytical survey method, research carried out in the Kesumadadi Community Health Center Work Area, Central Lampung. The research design used is case control research. The population in this study was malnutrition data, namely 245 toddlers from Kesumadadi village and 212 toddlers from Sumberjo village obtained from the EPGBM of the Kesumadadi Health Center, Central Lampung in 2023. The sample in this study used a purposive sampling technique which was calculated using the Slovin formula with the results being 82 toddlers in the village. Kesumadadi and Sumberjo villages. This research instrument uses observation sheets and Denver II sheets. Data analysis used univariate and bivariate analysis using Chi Square.

Inclusion criteria is toddlers recorded in EPGBM data, toddlers who experience malnutrition, toddlers aged 1-5 years, mothers who want their toddlers to be respondents. But the exclusion criteria is Toddlers who were sick when the research was carried out

RESEARCH RESULTS

The results of the research were carried out by univariate analysis, namely the frequency distribution of malnutrition was 30 (37%) and not malnutrition was 52 (63%). Frequency distribution of normal gross motor status was 51 (62%), Suspect 28 (34%), Untestable 3 (4%). The results of bivariate

analysis have been carried out using chi square data analysis :

Tabel 1
The relationship between malnutrition status and gross motor development of children aged 1-5 years

Status Gizi	Motorik Kasar						Total		P value
	Normal		Suspek		Tidak dapat diuji		N	%	
	N	%	N	%	N	%			
Gizi Kurang	0	0%	27	90%	3	10%	30	36%	0,00
Tidak gizi kurang	51	98%	1	2%	0	0%	52	63%	

Hasil dari penelitian ini yaitu didapatkan balita yang motorik kasarnya normal terdapat 51 (98%) balita yang tidak gizi kurang, balita yang motorik kasarnya suspek terdapat 27 (90%) balita ber status gizi kurang dan 1 (2%) balita yang status gizinya baik. Balita yang motorik kasarnya tidak dapat diuji terdapat 3 (10%) balita yang status gizi kurang. Hasil chi square yang didapat yaitu $0,000 < 0,005$ yang artinya ada hubungan antara motorik kasar dengan status gizi pada balita.

DISCUSSION

Univariat

Frequency Distribution of Nutritional Status

The results of this study showed that 30 (21.6%) children under five were undernourished and 52 (63%) were well-nourished. According to the WHO NCBS classification of nutritional status, namely overnutrition, $BB/U \geq 2 SD$ and $BB/TB \geq 2 SD$, good nutrition, $BB/U < 2 SD$ to $2 SD$ and $BB/TB < 2 SD$ to $2 SD$, undernutrition $BB/U < -2 SD$ up to $> -3 SD$ and $BB/TB < -2 SD$ up to $> -3 SD$, malnutrition $BB/U < -3 SD$ and $BB/TB < -3 SD$. Malnutrition is a subacute or chronic nutritional condition, where the combination of various levels of malnutrition and inflammatory activity has caused changes in body composition and reduced organ function, characterized by body weight for age (TB/U) which is $< -2 SD$ to $> -3 SD$ WHO-NCHS standard table. Nutritional and health disorders during this period can negatively affect children's physical (motor development) and cognitive development (Worku et al., 2018).

According to research (Ratna Suhartini et al., 2018), the normal nutritional status category was 26 people or (78.8%) while the smallest was in the deficient nutritional status category, 7 people or (21.2%). According to other research (Aprilidia et al., 2021) there are 35 (33.1%) malnourished toddlers and 71 (66.9%) undernourished children. According to the researchers' assumptions, when conducting research, researchers carried out anthropometric

calculations to re-measure toddlers who had malnutrition status according to the EPGBM cohort. Researchers took measurements with reference to the BB/U anthropometric table. Anthropometric measurements were carried out when looking at the cohort and repeated anthropometric measurements were also carried out directly on the toddlers when the researchers were going to conduct the research. All malnourished mothers of toddlers are less willing to carry out research on their toddlers.

Gross Motor Frequency Distribution

The results of this study showed that there were 51 (62%) children with normal gross motor skills, 28 (34%) with suspected gross motor skills and 3 (4%) with gross motor skills who could not be tested. Gross motor skills stimulate children's abilities when doing activities by using their large muscles, such as non-locomotor, locomotor and manipulative. Non-locomotor is a movement activity without having to move the body to another place, for example: stretching, folding, pushing, pulling and bending. Locomotor is the movement activity of moving the body from one place to another, for example: walking, running, jumping, jumping, hopscotch and skipping rope (Endang, 2018).

The Denver II test is a test used to evaluate the development of early childhood, namely ages 0-72 months or 0-6 years, which consists of four development sectors, namely: personal social/social behavior, fine motor adaptive/fine motor movements, language, and gross motor/gross motor movements and has four assessments, namely advance, normal, caution, and delayed (Soetjningsih, 2014 According to research (Destriani et al., 2023), it can be seen that this research found two categories of gross motor skills, namely normal and deviant. There were results that 16 respondents (88.9%) had normal gross motor development. Meanwhile, 2 respondents (11.1%) had deviant gross motor development.

According to the researchers' assumptions, during the research the researchers carried out gross motor skills measurements using the Denver sheet. The results from the researchers showed that three categories of gross motor skills were obtained, namely normal, suspected and not testable. Most normal toddlers do not experience malnutrition. For toddlers who could not be tested, the researchers only did it at that time and did not make repeat visits because of the toddler's history of previously having gross motor skills measured by the health center midwife with the same results.

Bivariat

The results of this study were that 51 (98%) toddlers whose gross motor skills were normal were well-nourished, 27 (90%) toddlers whose gross motor skills were suspected to have poor nutritional status and 1 (2%) toddler whose nutritional status was good. . Of the toddlers whose gross motor skills could not be tested, there were 3 (10%) toddlers who had poor nutritional status. The chi square results obtained were $0.000 < 0.005$, which means there is a relationship between gross motor skills and nutritional status in toddlers. Gross motor skills are movements that involve large muscles. Gross motor skills require several elements, including: speed, strength, endurance, agility, flexibility, coordination and balance. The higher the quality of the child's growth and development process at an early age, the more it will influence the quality of human life in the future. Children who are involved in physical activity have basic competencies in basic motor skills, and children learn basic motor skills through well-designed and planned movement programs (Asmuddin et al., 2022).

Results showed that there was a significant relationship between stunting and gross motor development ($p = 0.013$) and fine motor ($p = 0.026$). Stunting children tend to have impaired motor development in both gross and fine motor skills (Dinna, 2020). According to (Totfah *et al*, 2021) Almost all of the children with normal gross motor skills (78.1%) have a normal nutritional status with the results of Fisher's Exact analysis shown p value = 0.007 ($p < 0.05$).

Children's health and nutrition greatly influences the optimization of children's gross motor development, considering that children are in a period of very rapid physical growth and development. One of the factors that influence gross motor skills is nutritional status, this is characterized by an increase in the volume and function of the child's body. In this rapid gross motor development, children need adequate nutrition to form new body

cells and body tissue. A child's health that is disturbed due to illness will slow down their physical growth/development and will damage the child's cells and body tissues (Hurlock, 2021).

Other reaserch (Diani Maryani, 2023) there is The significant relationship between nutritional status and toddler development is $p=0.0003$, smaller than α (0.05). So that it can't was concluded that the majority of respondents in this study had normal nutritional status and toddler development is in the normal category, and there is a relationship between nutritional status and toddler development.

Health workers are expected to carry out developmental screening to assess early the development of Toddlers and people

Parents are expected to pay attention to nutritional status and development

This is the same as research (Satriawati & Sarti, 2021) The Spearman Rank Test results obtained a significance value of $p= 0.000$ because $p < \alpha$ ($0.000 < 0.05$) which means H_0 is rejected, this shows that there is a relationship between nutritional status and gross motor development children aged 1-3 years. Other research also found the same results as this research, namely research (Bakhtiar et al., 2022) Respondents who had poor nutritional status mostly had late gross motor skills, namely 14 respondents (53%) and respondents who had good nutritional status mostly had poor motor skills. late, namely 112 respondents (99%) with chi square test results $p = 0.001 < \alpha$ 0.05, so there is a significant relationship between nutritional status and gross motor skills.

Another study (Utami, 2023) showed that the majority of respondents with poor nutritional status had doubtful development at 25%, while respondents with good nutritional status mostly had appropriate development at 88.6%. Respondents with deviant toddler development mostly had poor nutritional status, namely 3 people (100%). The Chi Square test results obtained a p value of 0.003 which is smaller than $\alpha = 0.05$. Research (Yunita, 2021) results of statistical analysis show a probability value ($p=0.026$), which means that if the value ($p=0.026$) $< \alpha$ 0.05 there is a significant relationship between nutritional status and the gross motor development of preschool children in the Posyandu area of Bunga Maja District. Gunung Sari.

In line with research (Nugroho & Rahayu, 2021) that relationship between children's nutritional status and abilities children's gross motor skills. Other reasech (Mimi Ruspita & Khobibah, 2021) there is a significant relationship between malnutrition and gross motor development

The results of the statistical test of Kendall's tau correlation are 0.427 with a significance value of 0.002. Kendall's tau value was then followed by a manual Z test with Z count > from Z table (4.08 > 1.960) so it can be stated that there is a significant relationship between nutritional status and gross motor development aged 1-24 months at Posyandu Dwi Rahayu 3 By Therefore, it is recommended for mothers who have toddlers, especially aged 1-24 months to improve care and provide nutritious food for children so as to establish good child nutrition so that children's motor skills are also good (Dahlia, 2022).

Other reaserch (Mutsirah, *et al*, 2022) the results of the data analysis obtained were Asym (2-tailed) = 0.024 < 0.05 so that H1 was accepted and H0 was Tolak means that a child's motor skills develop if they have good nutritional status, this shows There is a relationship between nutritional status and gross motor development in children aged 5-6 years.

According to (Titin Supriatin, 2022) There is a relationship between health status and gross motor development in toddler-aged children. Other reaserch. Other Reaserch (Guntur *et al*, 2022) The research results show that p value = 0.000 (p<0.05), which means there is a relationship significant relationship between protein consumption and gross motor development aged 6 - 24 months.

The researcher's assumption is that children who are suspected and cannot be tested are due to insufficient nutritional intake required so that the energy produced is also insufficient to transmit nerve impulses to produce motor movements. Apart from that, it also means that the child's muscles have not developed well so they experience inhibition. Toddler delays are also found in toddlers who experience malnutrition.

CONCLUSION

The result 51 (98%) toddlers whose gross motor skills were normal were well-nourished, 27 (90%) toddlers whose gross motor skills were suspected to have poor nutritional status and 1 (2%) toddler whose nutritional status was good. . Of the toddlers whose gross motor skills could not be tested, there were 3 (10%) toddlers who had poor nutritional status. The chi square results obtained were 0.000 < 0.005, which means there is a relationship between gross motor skills and nutritional status in toddlers.

SUGESTION

Malnutrition can be prevented so that all toddlers have good nutritional status and normal gross motor skills.

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