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Relationship Between Nutritional Status and Gross Motor Development in Toddlers Aged 1-3 Years in the Working Area of Wara Utara City Health Center in 2024

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Abstract. Nutritional status is a condition resulting from a balance between the intake of nutrients from food and the need for nutrients needed for body metabolism. Nutritional status influences gross motor development. The development of a child's gross motor skills is very important for the child's survival because if it is disturbed, the child's movement can be hampered which is influenced by the nerve muscles themselves, for example walking, running, jumping and others. The research was carried out at the Wara Utara City Health Center in June-July 2024. This type of research is analytical correlation. Number of samples 30. Chi square data analysis. From 30 samples, 26 people had normal nutritional status, 1 was undernourished and 6 were overnourished. Then there were 29 people who developed well. So the chi square results obtained p = 0.000, which means there is a relationship between nutritional status and gross motor development in toddlers aged 1-3 years. The advice given is that families should pay more attention to children's nutritional intake so that children can grow and develop well and healthily.

Keywords: Nutritional status, development, gross motor skills

1. INTRODUCTION

The future of a nation depends on the success of children in achieving optimal growth and development. The first years of life, especially the period from when the fetus is in the womb until the child is 2 years old, is a very important period in the child's growth and development. This period is a golden opportunity as well as a time that is vulnerable to negative influences. Good and sufficient nutrition, correct care, and appropriate stimulation during this period will help children to grow healthily and be able to achieve their optimal abilities so that they can contribute better to society. Appropriate stimulation will stimulate the toddler's brain so that the development of movement, speech and language skills, socialization and independence in toddlers takes place optimally according to the child's age (KemenkesRI, 2020).

Physical growth disorders in children can include wasting, stunting and overweight, while child development disorders can include behavioral deviations, delays in gross motor skills, fine motor skills, speech and language, as well as socialization and independence (Dela Melia Inggriani, 2019). Early detection of deviations in growth and development needs to be done to be able to detect early any deviations in the growth and development of toddlers, including following up on any complaints from parents regarding problems with their child's growth and development.

WHO data for 2019 shows that growth problems are not only poor nutrition, but also shortness and overnutrition. The prevalence of malnourished toddlers is 7.3%, overweight is 5.9% and stunted (short) toddlers is 21.9% (WHO, 2019). The results of research by world researchers for WHO stated that globally, there were 52.9 million children younger than 5 years old, 54% of boys had developmental disorders in 2020. Around 95% of children had

developmental disorders. development of life in low- and middle-income countries. Nationally in Indonesia, the prevalence of nutritional status for children under five consists of 3.9% poor nutrition, 13.8% undernutrition, 79.2% good nutrition and 3.1% overnutrition. The prevalence of developmental deviations in children under 5 years of age in Indonesia reported by WHO in 2021 is 7,512.6 per 100,000 population (7.51%) (World Health Organization, 2021).

According to IDAI, 2013 About 5 to 10% of children are estimated to experience developmental delays. Data on the incidence of general developmental delays is not yet known with certainty, but it is estimated that around 1-3% of children under 5 years of age experience general developmental delays (Dela Melia Inggriani, 2019). The prevalence of nutritional status of children under five in South Sulawesi Province consists of 12.5% poor nutrition, 13.0% undernutrition, 82.3% good nutrition, and 2.2% overnutrition (RI Ministry of Health, 2021). The prevalence of malnutrition for 5 years (2017 - 2021), fluctuated up and down, especially in 2021, it decreased by 0.02 when compared to 2017. The results of a preliminary study conducted at the Wara Utara City Health Center on March 20 2019 showed that data on the number of toddlers in in the entire area the work coverage of the puskesmas is 6470 children. In the records of the North Wara City Health Center, growth and development problems that have occurred are malnutrition, stunting, fine and gross motor disorders and language problems, which reached 10 cases throughout 2024.

The results of the research show that there is a significant relationship between nutritional status and the growth and development of babies 6-9 months in the Jetis Health Center Working Area, Yogyakarta City. Other research conducted by Febriani, et al (2019) showed that babies who received good nutrition 8,333 times experienced growth and development appropriate to their age. This proves that there is a relationship between providing nutritional status and the growth and development of babies aged 6 months. It is very important to assess children's development so that early stimulation and intervention can be carried out before abnormalities occur. Prevention efforts as early as possible require early detection every three months in children aged 0-12 months and every six months in children aged 12-72 months and can be carried out at all levels of health services. One of the early detection efforts can be carried out starting from the basic health level, namely posyandu (Sugeng, Tarigan and Sari, 2019).

The percentage of malnutrition at the North Wara City Community Health Center is classified as high because the percentage of cases is more than 30%, where according to nutritional status standards it is considered to require attention if the prevalence is more than 5%, however this condition still requires attention because this nutritional problem can continue and affect the future growth of the baby. The aim of this research is to analyze the relationship between nutritional status and gross motor development in toddlers aged 1-3 years in the work area of the Wara Utara City Health Center in 2024.

1.1 Nutritional Status

Nutritional status is a condition resulting from a balance between the intake of nutrients from food and the need for nutrients needed for body metabolism. Each individual requires different nutritional intake between individuals, this depends on the person's age, gender, daily body activity and body weight (Dela Melia Inggriani, 2019). In general, nutritional status assessment is divided into two, namely direct and indirect nutritional status assessment. Direct nutritional status assessment can be divided into four assessments, namely:

a. Anthropometrics
   In general, anthropometric measurements refer to the size of the human body. Anthropometry is used to see imbalances in protein and energy intake. This imbalance can be seen in physical growth patterns and the proportion of body tissues such as fat, muscle and the amount of water in the body. (RI Ministry of Health PMK No. 2, 2020)
b. Clinical
   Clinical examination is a very important method in assessing people's nutritional status. This method is generally used for rapid clinical surveys. This survey is designed for rapid detection of common clinical symptoms of several nutritional deficiencies.
c. Biochemistry
   Assessment of nutritional status using biochemistry is a laboratory sample test carried out on various body tissues, including; blood, urine, feces and some body tissues such as liver and muscles. This method is used to warn that more serious malnutrition may occur because many of the clinical symptoms are less specific; chemical measurements may be more useful for identifying specific nutritional deficiencies.
d. Biophysical
   Biophysics can generally be used in certain cases, such as epidemic night blindness. The method used is the dark adaptation test (Dela Melia Inggriani, 2019)

Table 1 Nutritional Status Indicator

Indicator	Nutritional Status	Z-Score
BB/U children aged 0-60 months	*severely underweight*	< -3,0 SD
	underweight	-3,0 SD s/d < -2,0 SD
	Normal	-2,0 SD s/d 1,0 SD
	Risk of being overweight	> 1,0 SD
TB/U children aged 0-60 months	*severely stunted*	< -3,0 SD
	stunted	-3,0 SD s/d < -2,0 SD
	Normal	-2,0SD s/d 3 SD
	Tall	>3,0 SD
BB/TB children aged 0-60 months	*severely wasted*	< -3,0 SD
	wasted	-3,0 SD s/d < -2,0 SD
	normal	-2,0SD s/d 1 SD
	possible risk of overweight	>1,0 SD s/d 2 SD
	overweight	>2,0 SD s/d 3 SD
	O*bese*	>3,0 SD
IMT/U children aged 0-60 months	*severely wasted*	< -3,0 SD
	wasted	-3,0 SD s/d < -2,0 SD
	normal	-2,0SD s/d 1 SD
	possible risk of overweight	>1,0 SD s/d 2 SD
	overweight	>2,0 SD s/d 3 SD
	Obese	>3,0 SD

(Source: Permenkes No. 2, 2020)

1.2 Gross Motor Development

According to Almatsier (2016) Development includes cognitive, language, motor and behavioral development processes as a result of interaction with the environment (Dela Melia Inggriani, 2019). The following is a table of child development by age:

Table 2. Child Development Stages

Aged 0-3 month
a. Raising the head as high as 45^0 b. Move head from left/right to center. c. Looking and looking at your face. d. Spontaneous babbling or reacting by babbling. e. Likes to laugh out loud. f. Acts surprised at loud sounds. g. Smile back when spoken to/smile. h. Get to know the mother by sight, smell, hearing, contact
Aged 3-6 month
a. Turn from prone to supine. b. Raises head as high as 90^0 c. Maintain an upright and stable head position. d. Holding a pencil. e. Grabs objects that are within reach. f. Holding his own hand. g. Try to broaden your view. h. Directs his eyes to small objects. i. Makes high-pitched happy sounds or squeals. j. Smile when you see interesting toys/pictures while playing alone
Aged 6-9 month
a. Sitting (trypoid stance - alone) b. Learn to stand, both legs support some of your body weight.

c. Crawling to reach for a toy or approach someone.
d. Transferring objects from one hand to another.
e. Pick up 2 objects, each arm holds 1 object at the same time.
f. Pick up objects the size of nuts by scooping.
g. Making meaningless sounds, mamama, bababa, dadada, tatata.
h. Looks for dropped toys/objects.
i. Play clapping/peek-a-boo.
j. Have fun by throwing objects.
k. Eat your own cake.

Aged 9-12 month

a. Lifting objects to a standing position.
b. Learn to stand for 30 seconds or hold on to a chair.
c. Can walk with a lead.
d. Extends arm/body to reach the desired toy.
e. Hold the pencil tightly.
f. Putting objects in the mouth.
g. Repeating imitating sounds heard.
h. Saying 2-3 syllables with no meaning.
i. Exploring the surroundings, curious, wanting to touch anything.
j. Reacts to soft sounds or whispers.
k. Happy to be invited to play "CILUK BAA".
l. Knows family members, is afraid of people he doesn't know

Aged 12-18 month

a. Stand alone without holding on.
b. Bend over to pick up a toy then stand back up.
c. Walk back 5 steps.
d. Calling father "papa". Calling mother "mama"
e. Stack 2 cubes.
f. Put the cube in the box.
g. Pointing to what he wants without crying/whining, the child can make a pleasant sound or pull the mother's hand.

Aged 18-24 month

a. Stand alone without holding on for 30 seconds.
b. Walk without staggering.
c. Clapping, waving.
d. Stack 4 cubes.
e. Pick up small objects with your thumb and index finger.
f. Roll the ball towards the target.
g. Say 3-6 words that have meaning.
h. Helping/imitating household chores.
i. Holding your own cup, learning to eat and drink by yourself.

Usia 24-36 bulan

a. Walk up the stairs yourself.
b. Can play with small sandals.
c. Scribble pencil on paper.
d. Speak well using 2 words.
e. Can show 1 or more parts of his body when asked.
f. Look at pictures and be able to correctly name 2 or more objects.
g. Help pick up their own toys or help lift dishes if asked.
h. Eat your own rice without spilling much.
i. Taking off his own clothes.

Usia 36-48 bulan

a. Stand 1 leg 2 seconds.
b. Jump with both legs raised.
c. Pedaling a tricycle.

d. Draw straight lines.
e. Stack 8 cubes.
f. Recognizes 2-4 colors.
g. Mention name, age, place.
h. Understand the meaning of the words above, below, in front.
i. Listen to stories.
j. Wash and dry your own hands.
k. Wearing trousers, shirt.

Source: KemenkesRI, 2016

2. METHODS

This type of research is analytical correlation, a form of observational research with a cross sectional research design because the research was conducted at one time and once, there was no follow up to determine the relationship between nutritional status and gross motor development in children aged 1-3 years in the work area of the Community Health Center. North Wara City, Palopo. The population in this study were all children under five at the Wara Utara City Health Center, Palopo in 2024, totaling 85 people. The samples in this study were 30 children aged 1-3 years at the Wara Utara City Health Center, Palopo in 2024. The sampling technique used is purposive sampling, which is based on certain considerations made by the researcher himself. Inclusion criteria are the general characteristics of research subjects from a target population that is reached and will be studied. The inclusion criteria in this study were children who did not suffer from infectious diseases or certain chronic diseases at the time of the study, who came to the Posyandu during the study and whose parents were willing to be respondents. Exclusion criteria were children under five who were receiving a nutritional status improvement program (PMT recovery) and were sick at the time of the research.

The data used is secondary data is data obtained indirectly. Secondary data was obtained using the documentation method. Secondary data used in this research is research data on breastfeeding obtained from interviews with mothers. The toddler weighing data is then classified for nutritional status based on the BB/U and PB/U indexes according to the Indonesian Ministry of Health 2020 obtained by direct measurement while developments are from the child growth and development officer's DDST recording book or by direct tests on toddlers who have not been examined using the DDTK form.

The research instrument uses a questionnaire, the growth and development instruments used in the research are weight scales and height or body length measurement tools based on the World Health Organization National Statistics (WHO-NCHS) Z-score table. Meanwhile, the instrument for assessing the motor development of toddlers aged 1-3 years uses the KPSP form from the Indonesian Ministry of Health's standard SDIDTK (2016).

There are 2 data analyzes, namely univariate analysis which aims to explain or describe the characteristics of each research variable. Bivariate analysis was carried out to test whether there was a relationship between the independent variable and the dependent variable using statistical tests. The statistical test used to assess this research is the chi-square test in SPSS for Windows. Interpretation of Chi Square test results if the p value is> 0.05 then it means that there is no significant correlation between the two variables tested. Meanwhile, if the p value <0.05 then it means that there is a significant correlation between the two variables tested.

3. RESULTS AND DISCUSSION

1.1 RESULT

a. Nutritional Status

Table **3**. Nutritional Status of Toddlers Aged 1-3 Years in the Working Area of North Wara Health Center, Palopo City, Year **2024**

Nutritional Status	Frequency	Percentage
Malnutrition	1	3%
Normal Nutrition	23	77%
More Nutrition	6	20%
Total	30	100%

Source : Primary Data 2024

Based on the table above, it shows that the majority of toddlers aged 1-3 years have normal nutritional status, 23 people (77%), 6 people with over-nutrition status (20%) and only 1 person (3%) with under-nutrition status.

b. Gross Motor Development

Table 4. Gross Motor Development in Toddlers Aged 1-3 Years in the Working Area of North Wara Health Center, Palopo City, Year 2024

Development	Frequency	Percentage
According to the stage of development	29	97%
Doubtful	1	3%
Deviation	-	-
Total	30	100%

Source: Primary Data 2024

Based on the table above, it shows that the majority of toddlers aged 1-3 years have gross motor development in the developmentally appropriate category, namely 29 people (97%) and only 1 person (3%) whose development is doubtful.

c. Relationship between nutritional status and gross motor development

Table 5. The Relationship between Nutritional Status and Gross Motor Development in Toddlers Aged 1-3 Years in the Working Area of North Wara City Health Center, Palopo City in 2024

Nutritional Status	Gross Motor Development				Total		ρ-value
	According to the stage of development		Doubtful				
	∑	%	∑	%	∑	%	
Malnutrition	0	0%	1	3%	1	3%	ρ=0,000
Normal Nutrition	23	77%	0	0%	23	77%	
More Nutrition	6	20%	0	0%	6	20%	
Total	29	97%	1	3%	30	100%	

Source: Primary Data 2024

Based on table 7, it shows that all toddlers aged 1-3 years who have normal nutritional status have gross motor development that is appropriate to their stage of development, namely 23 people (77%). Meanwhile, there was 1 toddler aged 1-3 years whose nutritional status was poor and had questionable gross motor development.

According to the results of the chi-square statistical test, a significant number or probability value (0.000) was obtained which was much lower than the significant standard of 0.05 or ($p < \alpha$), so the data Ho was rejected and H1 was accepted, which means there is a relationship between nutritional status and gross motor development in toddlers aged 1-3 years in the North Wara City Health Center Working Area, Palopo City.

2.1 DISCUSSION

A. NUTRITIONAL STAGE

Based on the results of data processing on nutritional status with the BB/U index, it was found that the highest percentage of children's nutritional status was in the normal nutritional status category as many as 23 people (77%), toddlers with over nutritional status were 6 people (20%) and the lowest percentage was in nutritional status. less than 1 person (3%).

Based on the research results, it is known that most children aged 1-3 years have normal nutritional status because mothers provide nutritious and varied food according to the needs of children aged 1-3 years. Nutritional status is more influenced by dietary factors and genetic factors from parents. Then there is still 1 person who is malnourished because the child's eating pattern is irregular due to the family's poor economic status. Nutritional intake is a child's need which plays a role in the growth and development process, especially in brain development. Children's ability to develop their motor nerve abilities is through providing a balanced nutritional intake. Providing balanced nutritional intake plays a very important role in the growth and development of children from fetuses in the womb, school-aged children, teenagers and even adults.

Malnutrition is a health disorder resulting from a lack or imbalance of nutrients needed for growth, thinking activities, and all things related to life. Many factors can result in malnutrition in children, such as the child's diet, and the mother's lack of knowledge about providing balanced types of food, it could also be due to certain diseases or conditions that cause the body to be unable to digest and absorb food completely.

From the research results, it was also found that the majority of children had more nutritional status. Nowadays, children are more interested in consuming junk food. Junk food is food that contains a lot of fat, is low in fiber, contains lots of salt, sugar, additives and is high in calories but is low in nutrition, low in vitamins and low in minerals.

According to researchers' assumptions, children aged 1-3 years who have good nutritional status will result in the child experiencing rapid growth and development, which indicates a balance between the amount of nutritional intake obtained and the need for use of nutritional substances by the body, especially by the brain.

This is in accordance with theory (Hasdianah, Siyoto and Peristyowati, 2014), children who get good nutritional intake usually look more active. Meanwhile, children who receive inadequate or inappropriate nutritional intake will cause developmental disorders because it affects the level of intelligence and brain development(Sela Fitri et al., n.d.2021).

B. GROSS MOTOR DEVELOPMENT

Most toddlers aged 1-3 years have gross motor development in the developmentally appropriate category, namely 29 people (97%) and only 1 person (3%) whose development is doubtful. Most of the percentage of toddlers have gross motor development according to the stages of development. Maintaining children's nutritional needs by parents at this stage of development is the key to maintaining children's appropriate motor development. One way is for parents to ensure that the food consumed must be balanced between calories, protein and vitamin A, iodine, iron, vitamins and other minerals.

The definition of gross motor skills is movements that use gross muscles or certain parts of the body, which are influenced by opportunities to learn and practice which must be trained by parents. The gross motor development of preschool children is emphasized on the coordination of gross motor movements, in this case related to activities using the child's body. According to Suhartini and Majid, 2018 motor skills will develop well if there is parental attention and good stimulation. The freedom of movement given to children during their growth period will influence the child's subsequent growth and development. The development of gross motor skills includes large muscle skills.

The results of this study are in accordance with which shows that the majority of children aged 1-3 years at Posyandu Syukur Nikmat Sungai Duren Village have good gross motor development, namely 90.2% (Sela Fitri et al., n.d. 2021).

C. THE RELATIONSHIP BETWEEN NUTRITIONAL STATUS AND GROSS MOTOR DEVELOPMENT IN TODDLERS AGED 1-3 YEARS

According to the results of the chi-square statistical test, a significant number or probability value was obtained (0.000), which means there is a relationship between nutritional status and gross motor development in toddlers aged 1-3 years in the North Wara Community Health Center Working Area, Palopo City. From the research results, it was found that there was 1 toddler with malnutrition who was experiencing a questionable stage of development.

From the results of the correlation distribution, it was found that there were 6 children who had more nutritional status but had development according to their age because obesity did not affect the child's developmental stage but what did influence it was the gross motor stimulation and children's games provided by the parents.

This is in line with research conducted in their research with the results that the majority of children aged 3-5 years (74.3%) with higher nutritional status had appropriate gross motor status. And there is a significant relationship with the sig value. 0.002 (Sela Fitri et al., n.d.2021).

From the research results, it was found that 1 respondent with poor nutritional status also had questionable gross motor development. This is due to disturbances in the delivery of nerve impulses that affect motor movements caused by a lack of nutritional supply to maximize the work of signal delivery. This can also happen due to several factors, such as a lack of stimulation for children, low self-confidence, lack of family and environmental support.

There are several reasons given by parents who have cases of children with malnutrition and poor gross motor development, including that children have difficulty eating and only eat foods they like, such as instant noodles, eggs, stall snacks, fish and on average children are more often given formula milk. since the age of less than a year and the reason is that the parents are busy so they don't pay much attention to the child's nutritional intake because the child is looked after by a grandmother or nanny while they are away from work. Entering the third year of age, children's physical activity begins to increase. Children prefer games that require movement such as playing ball, cycling and other types of games that require physical movement. These skills will develop well if they are supported by the child's ability to carry out the necessary physical movements.

The researcher's assumption is that the hampered gross motor development in toddlers is caused by a lack of stimulants from parents coupled with a lack of knowledge about how to stimulate children according to their age stages. Therefore, some children receive attention to nutritional status from their parents but their psychomotor development is low due to a lack of growth and development stimulation for the child.

4. CONCLUSIONS

Based on the results of research entitled The Relationship between Nutritional Status and Gross Motor Development in Toddlers Aged 1-3 Years at the Wara Utara City Health Center, Palopo in 2024, it can be concluded as follows: The majority of toddlers aged 1-3 years have normal nutritional status in the area and have progress. appropriate to the developmental stage. So, based on the results of statistical tests, it was found that there was a relationship between nutritional status and gross motor development in toddlers aged 1-3 years. This research is still limited to other variables such as dietary factors, types of food and the development of babies under five from other aspects so it is hoped that future researchers should combine gross and fine motor development so that the research results are even better.

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