Factors Related to Motor Development in Toddlers Aged 2-3 Years at Nagaswidak Health Center, Palembang

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Factors Related to Motor Development in Toddlers Aged 2-3 Years at Nagaswidak Health Center, Palembang

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Abstract. *Approximately 5-10% of children worldwide experience impaired motor development. Disrupted child development will contribute to morbidity that occurs throughout the child's life cycle, the transmission of poverty between generations, and in the long term can hold back the pace of a country's development . The purpose of this study was to determine the factors associated with motor development in toddlers aged 2-3 years at the Nagaswidak Health Center, Palembang. The research design used observational analytic with a cross-sectional approach. The population was all mothers who had toddlers aged 2-3 years in the Nagaswidak Health Center working area in January - March 2024, totaling 32 people. Sampling used the total population technique . Data analysis used the Spearman rank test. The results of the study obtained a relationship between knowledge and gross motor development (p value 0.080) and fine motor (p value 0.135), a relationship between gender and gross motor development (p value 0.144) and fine motor (p value 0.135), a relationship between nutritional status and gross motor development (p value 0.000) and fine motor (p value 0.003). There is a relationship between nutritional status and motor development, there is no relationship between knowledge and gender and motor development. It is expected that all related parties will increase stimulation for children related to motor development.*

Keywords *: Motoric, Gender, Knowledge, Nutritional Status*

1. BACKGROUND

The World Health Organization (WHO) reports that children's problems in the world are related to health and well-being. WHO said that as many as 180 countries are experiencing child development problems, with Indonesia ranked 117th (Meok, 2021) .

Around 5-10% of children worldwide experience impaired motor development. Disrupted child development will contribute to morbidity that occurs throughout the child's life cycle, intergenerational transmission of poverty, and in the long term can hold back the pace of a country's development (Rosidi et al., 2023) .

The number of toddlers in Indonesia experiencing developmental disorders is 15-20%, delays in motor and language aspects which are partly due to lack of stimulation . The results of basic health research, the percentage of children experiencing fine motor development disorders in Indonesia is 9.4%. Meanwhile, in 2022, fine motor development problems were experienced by 11.27% of children in Indonesia and in 2023 as many as 11.02% (Ministry of Health of the Republic of Indonesia, 202 3).

Children's health problems in South Sumatra Province is related to low birth weight, malnutrition, coverage breast milk exclusive Which decrease And heavy body excessive on child. Problems this health become reason disturbance motor development in childby 9.25% in 2021, 10.24% in 2022 and 9.78% in 2023 (BPS, 2024).

Palembang City in 2021, toddlers (2–5 years) were 54.12% with 4.06% motor development problems. In 2022 it was 51.62% with 4.21% motor development problems. In 2023 it was 51.45% with 4.15% motor development problems (BPS, 2024).

Motor development is a development related to various body movements and manipulating objects. Motor development consists of gross motor skills and fine motor skills. Gross motor development involves large muscles that include the development of head, body, limb movements, movement, balance and others (Ekayanti Tarigan & Bukit, 2022) . While fine motor skills are related to more complex coordination abilities (Apriliani, 2020).

According to (Ananditha, 2017) , factors related to motor development are nutrition, knowledge, environment, education and parental occupation, and parenting patterns related to the food consumed. Meanwhile, according to (Zahari et al., 2022) , factors that influence motor development include parenting patterns, genetic factors, maternal knowledge, socioeconomic status, nutritional status, parental education level, number of children in the family, birth spacing, the environment where the child grows and develops, and gender.

The results of the study (Fitri & Rosmaria, 2021) showed a relationship between nutritional status and gross motor development *p value* : 0.000. Lindawati (2019) in her study proved that nutritional status is related to fine motor development in preschool children with p = 0.01 . Research by Rosidi et al (2023) showed that there is a relationship between knowledge and children's motor development. Dewi (2019) found in her study that there is a relationship between gender and gross motor development *p value* 0.001 and fine motor development *p value* 0.016.

2. THEORETICAL STUDY

Toddler development is a stage of increasing the ability of body structure and function through the process of growth, maturation, and learning to achieve optimal function at the age of 1-3 years (Zahari et al., 2022) . The development of toddlers aged 2-3 years is the concept of a critical period and high plasticity in the growth and development process, so the age of one to three years is often a *golden period* (golden opportunity) to increase the highest ability and high plasticity is the growth of brain cells

rapidly in a short period of time, sensitive to stimulation and flexible experience taking over the function of surrounding cells by forming synapses and greatly influencing the next growth and development period (Ekayanti Tarigan & Bukit, 2022) .

Motor development is the process of growth and development of children's movements as a consequence of complex interaction patterns between physical parts and body systems, which are regulated by three elements: the brain, muscles, and nerves. Thus, although motor development is a concrete thing that can be observed directly, this motor development is a more complex issue than physical movement alone (Mulyani, 2020).

Motor development consists of gross motor skills and fine motor skills. Gross motor skills are developments related to body movements that use large muscles or most or all of the body parts that are influenced by the child's maturity. Gross motor skills are skills that include large muscle activities, such as moving the arms and walking (Bakhtiar et al., 2022) . Fine motor development is development related to a child's ability to perform movements that involve certain parts of the body and are carried out by small muscles, but require careful coordination such as observing something, pinching, writing and so on.

According to Hendradiningrat (2021), there are several factors that influence children's motor development, both internal and external factors. Factors that accelerate or slow down children's motor development are genetic factors, pre-natal conditions, post-natal child health & nutrition, intellectual intelligence, environmental conditions, parenting patterns, proper stimulation, and physical disabilities.

3. RESEARCH METHODS

The type of research used is quantitative research using an analytical observational design with a *cross-sectional approach* . The study was conducted at the Nagaswidak Health Center, Palembang in July 2024. The population in this study were all mothers who had toddlers aged 2-3 years in the Nagaswidak Health Center working area in May - July 2024, totaling 32 people. The sample consisted of 32 respondents collected using the accidental sampling technique. Data collection used primary data through interviews, measuring nutritional status and assessing respondents' motor development. Data analysis used the Spearman Rho test.

4. RESULTS AND DISCUSSION

Table 1. Frequency Distribution of Gross Motor Development, Fine Motor Development, Gender, Knowledge and Nutritional Status

No	Variables	f	%
1	Motor rough		
	- Normal	25	78.1
	- Abnormal	7	21.9
Total		32	100
2	Motor fine		
	- Normal	18	56.25
	- Abnormal	14	43,751
Total		32	100
3	Gender		
	- Man	17	53.1
	- Woman	15	46.9
Total		32	100
4	Knowledge		
	- Good	14	43.75
	- Not good	18	56.25
Total		32	100
5	Nutritional status		
	- Normal	24	75.0
	- Abnormal	8	25.0
Total		32	100

Table 1 shows that most respondents have normal gross motor development and normal fine motor development. Most respondents are male, most respondents have poor knowledge and most respondents have good nutritional status.

Table 2. Results of the Spearman Rho Test of Factors Related to Gross Motor Development in Toddlers Aged 2-3 Years at the Nagaswidak Health Center

Variables	*P value*	Coefficient Correlation	Correlation Level
Gender	0.144	0.210	Weak
Knowledge	0.080	0.314	Weak
Nutritional status	0.000	0.742	Strong

The results of the Spearman rho test in Table 2 show that the variable that has a relationship with gross motor development is nutritional status with a p value of 0.000 <0.05 with a strong correlation level.

Table 3. Results of the Spearman Rho Test of Factors Related to Fine Motor Development in Toddlers Aged 2-3 Years at the Nagaswidak Health Center

Variables	*P value*	Coefficient Correlation	Correlation Level
Gender	0.135	0.270	Weak
Knowledge	0.135	0.270	Weak
Nutritional status	0.003	0.619	Strong

The results of the Spearman rho test in Table 3 show that the variable that has a relationship with fine motor development is nutritional status with a p value of 0.000 <0.05 with a strong correlation level.

1. Relationship between Gender and Motor Development

Based on the results of the Spearman rho test, the relationship between gender and gross motor and fine motor development showed no relationship where the p value > 0.05. In line with Maharani's research (2019) which showed a p value of 1.00, meaning that there is no relationship between gender and motor development.

Gender is a biological characteristic that distinguishes between males and females. Gender plays an important role in the physical, motoric and psychological development of early childhood (Astuti, 2020). However, it still requires stimulation and support from the surrounding environment so that fine motor development can be achieved according to age stages.

Researchers assume based on the results of the study that gender is not a factor related to the development of gross or fine motor skills in children. Regardless of gender, if there is no stimulation and good parenting from parents, there can be a delay in motor development. However, researchers consider that the results of this study cannot fully represent or be said to be representative of the results of previous studies or future studies. Therefore, further research is needed involving more respondents.

2. The Relationship between Knowledge and Motor Development

Based on the results of the Spearman rho test, the relationship between knowledge and gross motor and fine motor development showed no relationship where the p value> 0.05. This result is supported by the research of Kumalasari and Wati (2020) entitled "Mother's Knowledge of Child Development with Gross and Fine Motor Development", showing no relationship between knowledge and gross motor development with a p *value* of 0.622.

In line with Harahap's (2022) research which stated that there was no relationship between knowledge (P = 0.572) and motor development in toddlers. This study is also in accordance with the results of Kumalasari and Wati's (2020) research entitled "Mother's Knowledge of Child Development with Gross and Fine Motor Development", showing that there was no relationship between knowledge and gross motor development with a p value of 0.614.

According to (Notoatmodjo, 2018), mothers who are well-informed will know about child development in stimulating child growth and development and understand the importance of motor skills for their child's development. Meanwhile, according to Soetjiningsih (2016), mothers who are well-informed can identify development starting from stimulating and parenting patterns in children aged 4-5 years.

Researchers assume that parents' knowledge of fine motor skills will be a motivation in monitoring children's motor development. Knowledge of how to stimulate development, knowledge of fine motor development according to age stages and knowledge of fine motor development problems can be factors that help determine fine motor development in toddlers . So it can be concluded that lack of knowledge about fine motor development can increase the chances of abnormal fine motor development.

3. Relationship between Nutritional Status and Motor Development

Based on the results of the Spearman rho test, the relationship between nutritional status and gross and fine motor development showed that there was a relationship where the p value ≤ 0.05 obtained a strong correlation level. The results of this study are in line with the research of Setiawati et al (2020) which

showed that there was a relationship between nutritional status and toddler development (*p-value* = 0.001).

The results of this study are also supported by research by Perwithasari and Amalia (2021) entitled "The Relationship between Nutritional Status and Motor Development in Children" which shows that there is a relationship between nutritional status and motor development (p = 0.04).

Research (Fitri & Rosmaria, 2021) also supports the results of this study where the p-value = 0.000 was obtained, which means that the p value <0.05, it can be concluded that there is a relationship between nutritional status and gross motor development in children aged 1-3 years at the Syukur Nikmat Posyandu, Sungai Duren Village, Muaro Jambi Regency.

Nutritional status is an important factor in determining a child's growth and development. Brain development in children is influenced by the intake of nutrients that enter the body . A brain that does not develop optimally will affect cognitive and motor development in children (Ministry of Health of the Republic of Indonesia, 2020).

Researchers assume that nutrition plays an important role in toddler development, one of which is motor development. Good nutrition and supported by stimulation by parents or family can improve motor skills, while malnutrition can inhibit motor development in children.

5. CONCLUSION AND SUGGESTIONS

Based on the results of the study, it can be concluded that the factors related to motor development in toddlers aged 2-3 years in the working area of the Nagaswidak Health Center, Palembang are nutritional status factors. Nutrition plays an important role in the growth and development of toddlers. All related parties are expected to strive to meet the nutritional needs of toddlers by increasing educational activities for parents of toddlers to be more positive in monitoring the development of toddlers' motor skills.

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