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Correlation Of Mother's Knowledge on Stimulation With Toddler's Gross Motor Development at The Age of 3-5 Years

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***Abstract*—Background: 16% of children under five in Indonesia have developmental disorders, both gross motor development and fine motor development. Approximately 35.4% developmental deviations such as deviations in gross motor skills, fine motor skills, and mental emotional deviations. In general, the purpose of preparing this scientific paper is to determine the relationship between the mother's level of knowledge about stimulation and the gross motor development of toddlers at the age of 3-5 years. Method: This type of research is analytical research with a correlation method using a cross sectional approach. The data used is quantitative data. The population in this study was 45 toddlers aged 3-5 years. Data collection techniques using questionnaires and data analysis techniques using the chi squere test. Results: The results showed that the value χ^2_{hitung} of the relationship between the level of maternal knowledge about stimulation and gross motor development of toddlers aged 3-5 years was 10,230 with a significance of p = 0.006. While the value of χ^2_{tabel} at the 5% significance level with df = 2 is 5.991. Because of $\chi^2_{hitung} > \chi^2_{tabel}$ (10.230>5,991), Ho is rejected. This means that there is a significant relationship between the level of maternal knowledge about stimulation and gross motor development of toddlers aged 3-5 years. Conclusion: There is a relationship between the mother's level of knowledge about stimulation and the development of children aged 3-5 years.**

Keywords*— knowledge, stimulation, gross motor development, toddlers

I. INTRODUCTION

According to Rahmitha in Safitri [1] The development of each child will go through developmental stages. These stages of development take place sequentially, continuously and within a certain tempo of development, and can be generally accepted. By understanding the stages of a child's development, parents will be able to assess the child's development according to generally accepted standards. If a child is observed who has developmental delays, parents can act immediately. Conversely, parents can also prepare children by providing stimulation in accordance with the child's abilities at a certain age.

According to Soetjiningsih in Apri [2] In child development there is a critical period, where stimuli or stimuli that are useful for potential development are needed, so that it needs attention. An important period in child development is the toddler period, because at this time it is the basic growth that will influence and determine the development of the next child. During this toddler period the development of language skills, creativity, social awareness, emotional, and intelligence runs very fast and is the basis for subsequent developments.

According to a preliminary study based on interviews with 15 parents who have children aged 3-5 years. Seven of them did not understand the procedures for giving proper stimulation to their children. Parents only nurture and educate based on the experiences they have experienced, for example their children are met with their food needs, are invited to joke, and are put to sleep until they grow up. They do not have a plan for the efforts being made to stimulate children. There is no special treatment given by parents to stimulate their children Observations of 15 children aged 3-5 years About 8 children in gross motor development of children are less well coordinated, for example 3 years old cannot go up and down stairs with alternating legs, age 4 year olds can't move forward in a straight line, 5 year olds can't catch a tennis ball with both hands, so this is an issue for parents to pay attention to. This can be seen from the gross motor development of children who have not been able to control body movements or coordinate all their limbs skillfully. The research objective was to determine the relationship between the level of maternal knowledge about stimulation and gross motor development in toddlers aged 3-5 years.

II. METHOD

Location The research was conducted in the working area of Puskesmas Wirun Sukoharjo. In this study, the type of research used is analytical research with the correlation method with a cross sectional approach. The data used are quantitative data.

According to Sugiyono [3] the sample is part of the number and characteristics possessed by the population. The sample in this study is useful, among others, to save costs, accelerate research implementation, save energy, expand the scope of research and obtain more accurate results [4]. In this study the samples used were mothers and toddlers aged 3- 5 years. The data collection method is a way for researchers to collect data that will be carried out in the study, there are 2, namely:

a. Primary data

Primary data in this study were obtained directly from the questionnaire filled out by the mother to determine the mother's level of knowledge about stimulation. Furthermore, observing the gross motor skills of toddlers aged 3-5 years using KMS gross motor development

b. Secondary Data

Secondary data in this study were data obtained from the Triyagan village midwife in the form of the number of toddlers who attended the posyandu and the number of

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toddlers aged 3-5 years, library books and the internet (Riwidikdo, 2012; p. 12).

The research instrument is a way for researchers to collect data that will be carried out in research or measuring data measurement tools in order to strengthen research results, which can be in the form of a questionnaire or questionnaire, observation, interview or a combination of the three (Hidayat, 2010; 98). In this study the questionnaire used is a closed questionnaire so that respondents only answer questions from existing answers. Namely answering questions with the answers provided, namely true or false by using a cross (X) or a checklist (√).

The data analysis in this study are:

a. Univariate Analysis

The data analysis used in this research is univariate which aims to explain or describe the characteristics of each research variable. In general, this analysis only produces a frequency distribution and percentage of each variable [4]. The formula for univariate analysis is:

$$P = x100\%$$

P: Percentage
n: Number of Questions
f: The number of correct answers [5]

The result of calculating the percentage of knowledge is entered into the standard objective criteria. These criteria are:
Good : 76% -100% correct answers to the questionnaire
Enough : 56% -75% correct answers to the questionnaire
Less : the answer to the questionnaire is correct <56% [6]

b. Bivariate Analysis

Bivariate analysis was carried out on two variables which were thought to be related or correlated. This analysis is used to determine the relationship between the independent variable and the dependent variable using statistical tests, namely between the level of maternal knowledge about stimulation and gross motor development of children aged 3-5 years using the chi squere test (χ^2) and the degree of confidence 95% with $\alpha = 0.05$. If the result of χ^2 (which corresponds to Df = 3 and $\alpha = 0.05$) <2 table, then Ha is accepted, which means that there is a significant relationship between the dependent variable and the independent variable [4].

Because using chi squared, the distribution used follows the distribution: □2 and Df = (d-1) (k-1). The chi squared formula is:

$$\chi^2 = \frac{\sum(fo-fe)}{Fe}$$

χ^2 = *chi kuadrat*
fo = observation (observed frequency of cell row column)
fe = expeted (expected frequency of rows and columns)

To determine the closeness, it is necessary to calculate using the Contingency Coefficient formula. The contingency coefficient technique is one of the bivariate correlational analysis techniques in which two variables are correlated. The correlated variable is categorical form or an ordinal symptom. Strength-weakness, high-low, or the size of the correlation number called the Contingency Coefficient (C) or often abbreviated as the Contingency Coefficient (KK). The contingency coefficient can be proven by: Ha then C = 0, and H0 then C if ≠ 0. The formula for the contingency coefficient is:

$$C = \sqrt{\frac{\chi^2}{N+2}}$$

C : Koefisien Kontingensi
χ^2 : the result of x count
N :number of respondents

The closeness of the relationship between the two variables can be interpreted from the following criteria:

Table 1. Guidelines for Interpretation of Contingency Coefficients [3]

Coefisien Interval	Indicator
0,00 – 0,199	Very low
0,20 – 0,399	low
0,40 – 0,599	moderate strong
0,60 – 0,799	very strong
0,80 – 1,000	

III. RESULT AND DISCUSSION

Result of Research

1. Respondent's characteristic

a. Frequency Distribution Based on Education Level

Table 2. Distribution of Frequency of Characteristics of Respondents Based on Education Level

No.	Education	Amount	Prosentase (%)
1	Low	41	91,11
2	Moderate	2	4,44
3	High	2	4,44
	Amount	45	100,00

Based on the data in table 4.1, it can be seen that the majority of mothers' education level is low, namely 41 respondents or 91.11%.

b. Characteristics of Respondents by Age of Children

Based on the data in table 4.2, it can be seen that the majority of children are 5 years old, namely 18 children or 40%.

Table 3 Frequency Distribution of Characteristics of Respondents by Age of Children

No.	Age	Amount	Prosentase (%)
1	3 years	13	28,88
2	4 years	14	31,11
3	5 years	18	40,00
	Total	45	100,00

2. Univariate Analysis

a. Mother's Knowledge Level About the Gross Motor Development Stimulation of Toddlers

Table 4. Mother's Knowledge Level About the Stimulation of Gross Motor Development of Toddlers

No	Stimulation knowledge	Amount	Prosentase (%)
1	Low	31	68,88
2	Moderate	6	13,33
3	Good	8	17,77
	Amount	45	100,0

Based on the data in table 4.3, it can be seen that the majority of mothers' knowledge level of stimulation is in the poor category, namely 31 respondents or 68.88%

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b. Gross motor development for toddlers aged 3-5 years

Table 5. Gross motor development for toddlers aged 3-5 years

No	Age	Gross motor development		Amount	Prosentase (%)
		same	Not same		
1	3 years	10	3	13	28,88
2	4 years	6	8	14	31,11
3	5 years	6	12	18	40,00
Amount		22	23	45	100,00

Based on the data in table 4.4, it can be seen that the level of motor development ability of the majority of children is in the inappropriate category, namely 23 respondents or 51.1%.

3. Bivariate Analysis

Relationship between Mother's Knowledge Level about Stimulation and Gross Motor Development of Toddlers aged 3-5 yearsHypothesis testing data analysis in this study used Chi-Square analysis. This analysis was used to determine the relationship between the mother's level of knowledge about stimulasi.

The tabulation results of the questionnaire score obtained a cross table between the level of knowledge and gross motor development of toddlers aged 3-5 years as follows:

		Motor development skills		χ^2
		Not Same	Same	
Knowledge level stimulation	Low	19	12	10.230
	%	61,3	38,7	
	Enough	4	2	
	%	66,7	33,3	
	Good	0	8	
	%	0,0	100,0	
Amount		23	22	
		51,1%	48,9%	

The table above shows that of the 31 respondents who had low level knowledge, 6 of them were sufficient and 8 were good. The value of χ^2_{hitung} calculated the relationship between the level of maternal knowledge about stimulation and gross motor development of toddlers aged 3-5 years was 10,230 with significance of p = 0,006. Sedangkan nilai χ^2_{tabel} pada taraf signifikansi 5% dengan df=2 adalah 5,991. Because of $\chi^2_{hitung} > \chi^2_{tabel}$ (10.230>5,991), then Ho was rejected. This means that there is a significant relationship between the level of maternal knowledge about stimulation and gross motor development of toddlers aged 3-5 years. The relationship pattern shows a positive relationship, this indicates that the higher the respondent's level of knowledge about stimulation, the better the respondent tends to be in providing stimulation to their children. On the other hand, the lower the respondent's level of knowledge about stimulation, the less likely the respondent is to stimulate his child.

Discussion

1. Mother's level of knowledge about stimulation of gross motor development of toddlers

The results showed that the majority of mothers' knowledge level about stimulation was in the low category. This is because the majority of respondents have a low level of education, namely not going to school as much as 91% and including basic education.

This is accordance with the research according to Alkhazrajy, A [7], there was association between the educational level of the mothers and their knowledge about motor function development, the educational level of the participant mothers and their knowledge of Cognitive and vision, Language and hearing and the social and emotional aspects of developmental milestone.

2. Gross motor development in toddlers aged 3-5 years

The results showed that the level of motor skills of the majority of children was not in the appropriate category. The research data showed that the children were not categorized according to their development, namely 23 respondents or 51.1%.

3. The relationship between the mother's level of knowledge about stimulation and gross motor development in children aged 3-5 years

The results showed that the value χ^2_{hitung} The relationship between the level of maternal knowledge about stimulation with gross motor development of toddlers aged 3-5 years is 10,230 with significance p= 0,006. While the value χ^2_{tabel} at the level of significance 5% with df=2 are 5,991. Because of $\chi^2_{hitung} > \chi^2_{tabel}$ (10.230>5,991), then Ho was rejected. This means that there is a significant relationship between the level of maternal knowledge about stimulation and gross motor development of toddlers aged 3-5 years.

4. Motor Development and Activity InToddlers Who Were Born Preterm

The result showed the sample (15 males, 53.6%) had a mean Gestational Age (GA) of 29.5 weeks with four who had been born small for gestational age (SGA). There was a small decline in fine motor quotients (FMQ) from infancy to toddlerhood (99.7 to 97, 95% CI −4.6, −0.7). Being born SGA predicted lower gross motor quotients (GMQ) during toddlerhood (p=0.04), however this effect was lost when sex and GA were included in the model (p=0.19). The addition of active play activity levels to step two of the model reduced overall variance in gross motor quotients (GMQ). When considered together with sex and GA,being born SGA was the only variable that significantly predicted lower FMQ During Toddlerhood (p=0.01), accounting for 40% of varience. The addition of quiet play activity levels tostep two of the model had no impact on the overall varience in FMQ.

This mean that While activity had limited relationships with toddler motor skill levels, a toddler who had been born SGA appeared to be at greater risk of fine motor delay. Although there was a decline in fine motor skills between infancy and toddlerhood, the change was small and scores remained with inthenormal developmental range at both time points.

5. Associations between gross motor skills and cognitive development in toddlers

The result showed that A total of 335 toddlers aged 11 to 29 months (mean age=19.80 ± 4.08months) completed all measures of gross motor skills and cognitive development. There were slightly more boys

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(n=180,53.7%)thangirlsandthemeanBMIwas17.84 ± 1.69kg/ m2. The average standard score for cognitive development was 11.45 ± 3.03. For gross motor skills, the average GMQ score was 96.41 ± 9.84 and 23.3% of the children scored 'below average'. For the different subtests, the standard scores were 8.42 ± 2.21 for locomotion, 9.86 ± 2.21 for object manipulation and 10.11 ± 1.24 for stationary. The percentage of children scoring 'below average' for the sub tests was 34.3% for locomotion, 10.1% for object manipulation and 0.3% for stationary. For object manipulation boys scored higher than girls (p=0.01). Overall, 43.6% of the children had a low socio-economic status. This mean gross motor skill levels have a significant positive association with cognitive development in this sample of toddlers.

6. Motor skill abilities in toddlers with autistic disorder, pervasive developmental disorder-not otherwise specified, and atypical development.

The result of Kruskal–Wallis tests found that gross and fine motor skills were significantly affected by diagnostic group, H(2)=13.93, p=.001, and H(2)=26.59, p=.000 respectively. A Bonferroni correctionwas applied to thefollow up Mann–Whitney tests so that p<.008 was used to determine significance. The significance ofmann–Whitney tests and effect sizes for gross motor skills between diagnostic groups. There was no significant difference between atypically developing toddlers (Mdn=11) and toddlers with PDD-NOS (Mdn=11) for gross motor skills, U =8759.00, p=.325, r=—.06. Toddlers with PDDNOS (Mdn=11) also did not have significantly different gross motor skills than toddlers with autistic disorder (Mdn=9), U=5264.50, p=.010, r=—.17. However, atypically developing toddlers (Mdn=11) had significantly greater scores on gross motor skills than toddlers with autistic disorder (Mdn=9), U =7366.50, p=.000, r=—.21 .

This mean No significant differences were noted between atypically developing toddlers and toddlers diagnosed with PDD-NOS on gross or fine motor skills. Similarly, there were no significant differences between toddlers with autistic disorder and PDDNOS; however, the significance level was low and did approach significance for both fine and gross motor skills (at p=.010). In contrast, atypically developing toddlers had significantly greater abilities in gross and fine motor skills than toddlers diagnosed with autistic disorder. As a result, current findings suggest that more severe core symptoms of an ASD may result in a host of difficulties.

IV. CONCLUSION

A. Conclusion

1. The level of knowledge of mothers about stimulation stimulation with gross motor development of children aged 3-5 years is mostly in the poor category.
2. Motor development in children aged 3-5 years is mostly not according to the stage of development.
3. There is a relationship between the mother's level of knowledge about stimulation and the development of children aged 3-5 years
4. This mean that While activity had limited relationships with toddler motor skill levels, a toddler who had been born SGA appeared to be at greater risk of fine motor delay.
5. This mean gross motor skill levels have a significant positive association with cognitive development in this sample of toddlers.

B. Suggestions

1. For Researchers

The results of this study can be used as a work to develop themselves in learning the science of child development, especially regarding gross motor development in children aged 3-5 years.

2. For Educational Institutions

Educational institutions should adopt policies so that they can be used as input and increase in knowledge for health workers in order to achieve the implementation of developmental education for children aged 3-5 years.

3. For Parents or Respondents

It is hoped that it can increase parental awareness in stimulating child development so that it can go through an optimal development process.

4. For Health Workers

It is hoped that it can increase the Early Detection and Development of Toddlers (DTKB) efforts by jointly creating programs for cadres and posyandu members to stimulate children, such as playing together supported by play tools that can improve gross motor development in children.

REFERENCES

[1] Safitri. *Overview of Gross Motoric Development in 3-5 Years Old Children in Manjung Boyolali Village. Research Report: School of Medicine. Muhammadiyah University of Surakarta. 2012. (Unpublished)*

[2] Apri. "*The Relationship between Mother's Knowledge Level about Kinetic Stimulation and Gross Motor Development Level in Preschool Children in Pucangrejo Village, the Working Area of Gemuh Kendal Health Center. Research Report: Health Polytechnic. Yogyakarta 2006. (unpublished)*

[3] Sugiyono. *Qualitative and Quantitative Research Methods R & D. Bandung: Alfabeta; 2011.h. 80, 81, 85, 184*

[4] Notoatmodjo., *Health Research Methodology. Jakarta: Rineka Cipta 2010; 2012.h. 8, 10,35, 37, 72, 98, 116, 117, 130, 137 171, 182, 183*

[5] Budiarto. *Biostatistics For Medicine & Public Health. Jakarta: EGC; 2011.h. 143*

[6] Dewi. *Neonates Care for Infants & Children under five. Jakarta: Salemba Medika; 2013.h. 66, 67*

[7] Lujain Anwar Alkhazrajy and Enas Rifaat Salah Aldeen. Assessment of Mothers Knowledge Regarding the Developmental Milestone among Children Under Two Years in Iraq. American Journal of Applied Sciences. 2017

[8] L,Johnny. Matson. Mahan,Sara.. Fodstad,Jill C. Hess, Julie A. Neal,Daniene. *United States: Lousiana State University. 2009*.