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RESEARCH

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Giving Exclusive Breastfeeding and Maternal Gestational Age Affects the Developmental Delay of Children Aged 3-36 Months

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Abstract

Developmental disorders can affect one or more areas of development such as gross motor, fine motor, speaking/using language, and social personality/independence. Factors that influence the development in children can come from internal factors (exclusive breastfeeding, and maternal gestational age) and external factors (maternal age and number of children under five in the family). Early detection of development is very important using the Developmental Pre-Screening Questionnaire or DENVER II. The objective of the study is to identify risk factors that influence delays in the development of children aged 3-36 months. This research is an analytic observational with case control approach. The research location was at Integrated Healthcare Unit, Primary Health Center of Rowosari, Semarang. The total sample of this study was 62 in children aged 3-36 months whose development was analyzed using the Developmental Pre-Screening Questionnaire instrument. The sampling technique used purposive sampling. The variables of this study were exclusive breastfeeding, gestational age, maternal age and the number of children under five in the family. Statistical tests used Chi-Square to analyze the relationship between internal and external factors with the delay in child development. The results show that exclusive breastfeeding ($p=0.042$) and gestational age ($p=0.042$) have a significant relationship with the development of children aged 3-36 months, while maternal age factors during pregnancy ($p=0.425$) and number of children under five ($p=0,353$) have no significant relationship. Thus, internal factors such as exclusive breastfeeding and maternal gestational age affect the developmental delay of children aged 3-36 months.

Keywords: Child Developmental Disorders, Developmental Pre-Screening Questionnaire

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1. INTRODUCTION

Developmental disorders are developmental delays that can affect one or more domains of development. The realm of development is divided into gross motor, fine motor, speech/language, and social personality (Narendra, M. B., 2004, Soetjningsih, 2013, Mithyantha et al., 2017). In children around the world, the incidence of developmental delays is around 10%. In 2011, the data obtained from UNICEF regarding developmental delays especially in gross motor skills were still in the high category at the age of toddlers at around 27.5% (Chapakia, M. I., 2016). In Indonesia in 2010, it was found about 35.7% of developmental delays incidence in children, included in the category of health problems in children according to the World Health Organization (WHO) reference because of the occurrence of more than 30%. Based on the research conducted in 2007 in Central Java province, 35.66% of cases experienced developmental delays (Widiaskara et al., 2017). This figure decreased compared to 2006 data of 53.44%, and in the same year, 436 visits to Kariadi Public Hospital, Semarang 22.9% experienced delays in speech development.

Screening is one of efforts to detect early growth and development in children. There are two types of developmental screening for children consisting of the Developmental Pre-Screening Questionnaire and Denver II. Developmental Pre-Screening Questionnaire is a developmental questionnaire for children aged 3 months to 6 years which aims to find out whether there is a developmental disorder or whether there is a deviation on children. This study used Developmental Pre-Screening Questionnaire screening type, because the subjects were children aged 3-36 months and their use is easier and more practical compared to Denver II.

There are several factors that affect children's development, which are internal and external factors (Soetjningsih, 2013). Internal factors comprise of breastfeeding and gestational age. Breastfeeding, in the development of exclusive-breastfeeding children, are needed starting from children aged 0-6 months, which if children are given additional food at this age, they will turn into a critical period not a golden period and it will affect delays in children (UNICEF, 2010). The external factors include mother's age and number of children under five. The number of toddlers, in families who have a small number of toddlers, attention, care, affection and time are more devoted compared to families who have a large number of toddlers (Narendra, M. B. et al., 2004). Previous research conducted by Moonik et al, 2015 dan Widiaskara et al., 2017 found several factors related to delays in the development of children aged 4-5 years, which are factors of parental education, family socio-economic, number of siblings, nutritional status, breastfeeding, and birth weight of babies.

Research that analyzes risk factors for developmental delay of children aged 3-36 months has not been reported. Therefore, the objective of this study is to identify risk factors that influence delays in the development of children aged 3-36 months, because the incidence of developmental delays in children is one of causes of children's health in the future.

2. RESEARCH METHOD

This research is an analytic observational study using a case control approach. The research location is Integrated Healthcare Unit, Primary Health Center of Rowosari, Semarang. The time of the study was in July 2019. The total sample in this study was 62 in children aged 3-36 months (31 in cases and 31 in controls) and parents who were willing to become respondents at Integrated Healthcare Unit, Primary Health Center of

Rowosari, Semarang. The sampling technique used purposive sampling that has met the inclusion criteria and exclusion criteria. The case inclusion criteria include children who are experiencing delays and parents who are willing to be respondents. Meanwhile, the control criteria are children who are not experiencing delays and parents who are willing to become respondents. Exclusion criteria include parents who are deaf-mute, children who have congenital, hormonal and physical abnormalities.

This research variable consists of independent and dependent variables. The independent variables are risk factors (exclusive breastfeeding, gestational age, maternal age at childbirth, number of children under five in the family, and maternal age during pregnancy) and the dependent variable is children's development. Children's development is analyzed using the Developmental Pre-Screening Questionnaire which analyzes 4 development sectors which are gross motor, fine motor, speech/language and socialization/independence. Developmental Pre-Screening Questionnaire according to age contains 9-10 questions about developmental abilities that have been achieved by children. Every question is asked to parents or nursemaid. Then, the answer "Yes" was calculated, if the number of "Yes" is 9 or 10, the children's development is suitable with the stages of development or there are no deviations. If the number of answers "Yes" is 8 or less, it is concluded that there are deviations. The analysis of the data was to analyze the relationship between the independent variable and the dependent variable using the Chi Square test with a significance of $p < 0.05$ and 95% CI. This research had been conducted an ethical review by the ethics commission of the Faculty of Medicine, University of Muhammadiyah, Semarang with No.074/EC/FK/2019.

3. RESULTS AND DISCUSSION

This study involved a total of 62 respondents with the following results.

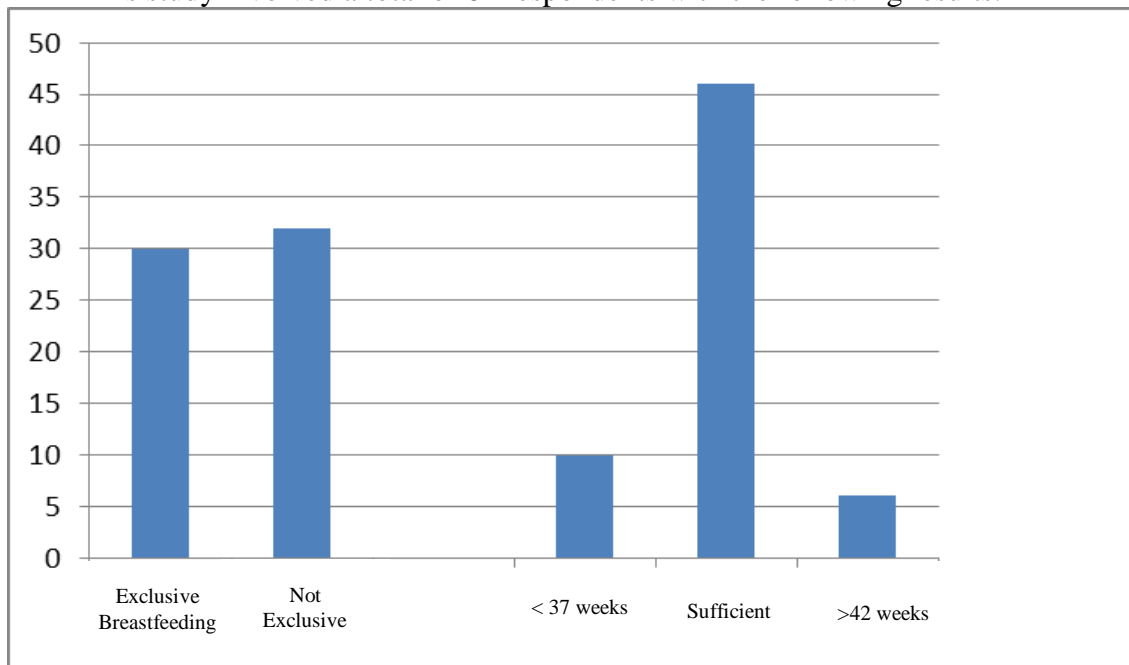


Figure 1. Data on the characteristics of internal factors including exclusive breastfeeding and maternal gestational age during childbirth.

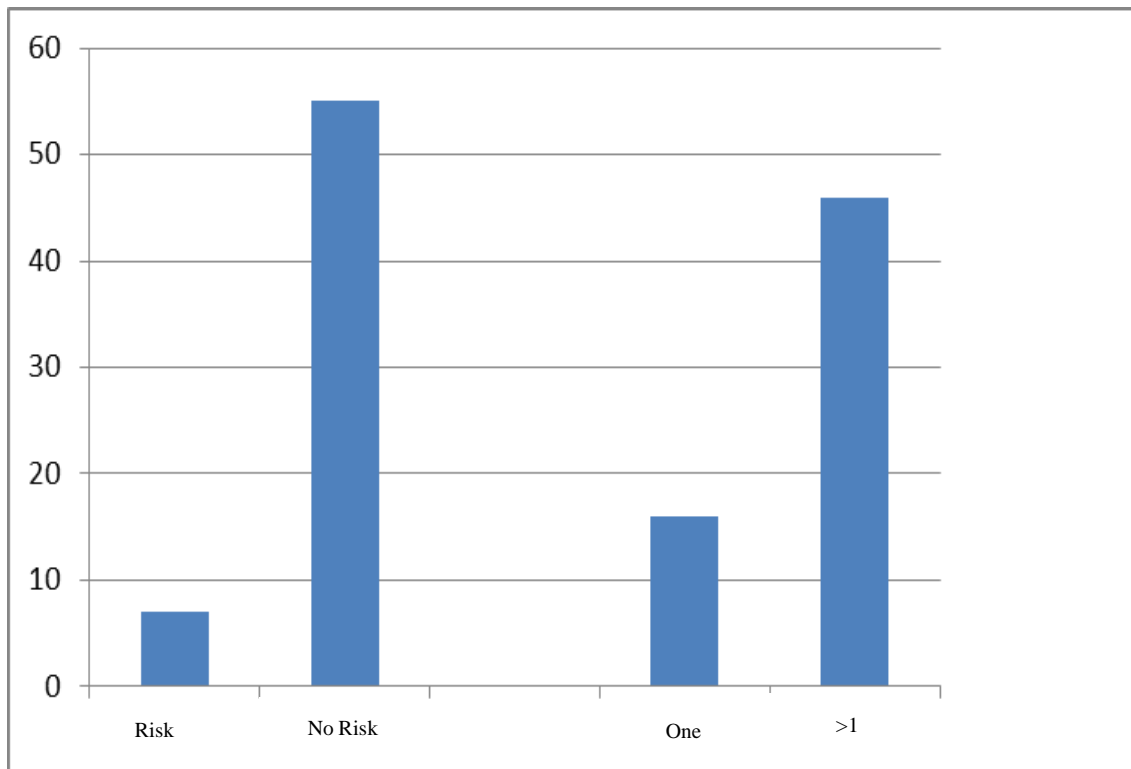


Figure 2. Data on the characteristics of internal factors including the age of the mother during childbirth and the number of children under five in the family.

Based on figures 1 and 2, it can be stated that the majority of samples did not get exclusive breastfeeding as many as 32 people (51.6%), gestational age when the mother gave birth was sufficient month as many as 46 people (74.2%), maternal age was not at risk as many as 55 people (88.7%), and the number of children under five in a family >1 was 46 people (74.2%).

Table 1. Relationship between Internal Factors and Development of Children 3-36 Months in Primary Health Center of Rowosari.

Variable	Children's Development				P	OR	IK 95%
	There is deviation		There is no deviation				
	n	%	n	%			
Exclusive Breastfeeding Application							
Exclusive Breastfeeding	11	35,5	19	61,3	0,042	0,347	0,124 - 0,974
Not Exclusive	20	64,5	12	38,7			
Gestational Age							
<37 weeks	8	25,8	2	6,5			
Sufficient	22	71,0	24	77,4	0,042	0,347	0,124 - 0,974
>42 weeks	1	3,2	5	16,0			

Table 2. Relationship of External Factors with developmental delay of children aged 3-36 months

Variable	Children's Development				P	OR	IK 95%
	There is deviation		There is no deviation				
	n	%	n	%			
Maternal age							
Risk	5	16,1	2	6,5	0,425	2,788	0,498 – 15,621
No risk	26	83,9	29	93,5			
Toddlers' number							
One	9	29,0	7	22,6	0,562	1,403	0,446 – 4,406
>1	22	71,0	24	77,4			

Based on table 1, the results show that there is a significant relationship between the history of exclusive breastfeeding with children's development ($p=0.042$). Statistical test results obtained $p=0.425$ on the relationship of maternal age with the development of children aged 3-36 months at the Primary Health Center Rowosari as in Table 2. It shows that the two did not show any significant relationship.

The results of this study indicate that there is a significant relationship between the history of exclusive breastfeeding and children's development. In theory, breast milk is proven to have a composition in accordance with children's development because it has a complete nutritional content and contains both cellular and humoral substances, so that mortality and morbidity in children who consume breast milk is lower than children who consume formula milk (Soetjningsih, 2013). This result is in accordance with other studies which stated that there is a significant relationship between exclusive breastfeeding and children's development (Yuni K. D., 2016). Moreover, other studies by Rosidi et al, 2019 also showed a close relationship between developmental status and exclusive breastfeeding. In contrast, these results are not in line with previous studies because it used a sample of toddlers aged 3-36 months with a case control approach whereas in the Moonik study, et al, the study used a sample of children aged 4-5 years with a cross sectional approach (Moonik et al., 2015).

Adequacy of nutrition in an individual's early life affects health and development in the next life, likewise, the adequacy of breastfeeding early in life. The content of long chain polyunsaturated fatty acids in breast milk can improve cognitive abilities and the duration of breastfeeding influences the development of the baby. Exclusive breastfeeding for 6 months has been shown to influence the development and behavior of young children as reported by Wells et al, 2012 and Jonsdottir et al, 2013. Other studies on toddlers aged 24-36 months by Nuryanti, D., 2009 proved that breastfeeding applied for less than 3 months causes the risk of gross motor disturbances 3 times compared to individuals who get exclusive breastfeeding for 6 months.

Other results of this study indicate that there is a significant relationship between gestational age at birth and the development of children aged 3-36 months at the Primary Health Center of Rowosari as stated in table 1. It is in line with research on 3-year-old children by Hochstedler et al, 2020 which proved that gestational age is inversely related to developmental delay. Increasing gestational age increases the risk of developmental delay. The cause can be explained in physiological theory where the study results obtained in the last weeks of pregnancy is a critical period for the development of the fetal brain at the level of anatomical, molecular and neurochemical

structures as proven by [Kapellou et al, 2006](#). The premature birth causes baby's brain which is not yet sensitive to the dangers that exist in the outside environment ([Kugelman, A. and Colin, A. A., 2013](#)). Babies born with preterm gestational age have a high risk associated with increased perinatal morbidity, developmental delay, behavior and learning disorders ([Brown et al, 2014](#) dan [Kerstjens et al, 2011](#)). However, unlike [Agarwal et al, 2018](#) who proved that there was no significant relationship between gestational age (premature and not) with the incidence of developmental disorders.

The age of the fetus in the womb starting from 28 weeks to 7 days after birth is an important period in the process of growth and development of children because it also determines the quality of life of the next baby ([Soetjiningsih, 2013](#)). Although the majority of respondents were at term gestational age, children born with sufficient gestational age may experience growth and development disorders caused by the condition of the mother during pregnancy, for instance due to nutritional factors and stress experienced by the mother during pregnancy ([Rosyidah, 2018](#)). The weakness in this study is the analysis was not conducted deeply in terms of nutritional conditions and stress when the mother is pregnant.

The age of mother during childbirth as the study sample was identified as an age at risk if <20 years and >35 years. Mothers who are pregnant at the age of risk are one of the criteria of high-risk pregnancies that will affect both morbidity and mortality in both mother and fetus. At the age of mothers over 35 years, they have a risk of giving birth to children with genetic disorders such as children with Down syndrome, so that children can experience stunted growth and development ([Hertanto et al., 2009](#)). One study stated that other causes of children's development delay are Down syndrome, disorders or nervous system infections such as cerebral palsy, spina bifida and mothers suffering from TORCH infections ([Al-naddawi, M., 2013](#), [Bélanger, S. A., & Caron, J. 2018](#)). The results of this study are not in line with Wulandari in 2017 which found a significant relationship between maternal age and children's development. The study stated that married women aged <20 years with immature reproductive organs tend to experience pregnancy and childbirth so that there is possibility of children born with Low Birth Weight (LBW), nutritional deficiencies, and developmental disorders.

Table 2 shows that the number of children under five does not show a meaningful relationship with children's development. This result is in line with research conducted by [Widiaskara tahun 2017](#). It is possible because in the family, the affection and attention given by parents to their children have been distributed evenly without comparing one child to another ([Widiaskara et al., 2017](#)).

4. CONCLUSION

Research conducted at Integrated Healthcare Unit, Primary Health Center of Rowosari, Semarang shows that the internal factors (breastfeeding and gestational age at childbirth) have a significant relationship with the development of children aged 3-36 months. Therefore, exclusive breastfeeding and maternal gestational age affect the developmental delay of children aged 3-36 months.

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