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RESEARCH ARTICLE

URL of this article: http://heanoti.com/index.php/hn/article/view/hn20307

The Effects of Stimulation on Children Experiencing Developmental Disorders

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ABSTRACT

The important period of the child growth and development is the time when a child is at the age of 0-5 because the abilities in language, creativity, social awareness emotion, and intelligence develop very rapidly and function as the base for the next developmental stages. Approximately 5-10% of children experience developmental delay. This observational analytical study was conducted in a cohort design using longitudinal or time period approach. Questionnaires were used to collect the primary data. The method used to choose the samples was consecutive sampling. Moreover, data analysis was done by using multiple logistic regression test. The results of this study showed that the dominant developmental disorder happening to the children under five was speech delay. The results of analysis using multiple logistic regression test showed that there were significant effects of stimulation on gross motor p = 0.034, on fine motor p = 0.037, on speech and language p = 0.036, and on social independence.p = 0.036. Thus, there were significant effects of stimulation on developmental disorder.

Keywords: Stimulation, Developmental disorder, Children

INTRODUCTION

The important period in child growth and development is the time when a child is between the age of 0-5 because the abilities in language, creativity, social awareness, emotion, and intelligence develop very rapidly and function as the base for the next developmental stages. Approximately 5-10% of children experience developmental delay. In fact, the indicators of successful development set by the Provincial Health Office of East Java in 2010 expect that 90% of children under the age of five have received early stimulation, detection, and intervention for child growth and development[(1)].

The parameter applied to assess the development of children under five comprises of gross motor movements, fine motor movements, speech and language, as well as social independence.RumahSakit Islam A.Yani (Surabaya Islamic General Hospital located on A. Yani Surabaya) has a child growth and development polyclinic with 250-300 visitors monthly. Among 290 children under five, 51.72% are detected to have motor delay and 44.14% have speech delay.

Some factors affecting the quality of child growth and development comprise of internal and external factors; one of them is stimulation. The parents have important roles to optimize child development by giving stimulation because the benefits of stimulation can stimulate the connection between the brain cells (synapse). Millions of brain cells develop since the pregnancy reaches 6 months. More stimulation makes synapse grows stronger and develops with more variations and complexities; thus intelligence develops broader and higher (multiple intelligence)[(2),(3)].

This study was purposed to analyze the effects of stimulation on child growth and development in children under the age of five experiencing developmental disorder.

METHODS

This observational analytical study was conducted in a cohort design using longitudinal or time period approach. It involved the mothers and their children under five having motor delay, speech delay, and global

developmental delay (GDD) found in the child growth and development polyclinic of Rumah Sakit Islam A.Yani Surabaya in March to May 2017 as the population. Consecutive sampling technique was used to choose the samples. Questionnaires were used to collect the primary data. The questionnaires which refer to the guidelines of SDIDTK (early stimulation, detection, and intervention for growth and development) used as the guidelines to receive answers from the respondents. Whilst, the data about developmental disorder experienced by the children under five were obtained from the results of evaluation done by the health workers/doctors in the child growth and development polyclinic by using Denver II test form. The collected data were categorical data so that they were presented descriptively in the form of frequency and percentage(4), then proceed with testing hypotheses using multiple logistic regression tests

This study was approved by the Ethics Committee for Health Reasearch Public Health Faculty Airlangga University.

RESULTS

The results of this study showed that most of the mothers rarely gave stimulation with different reasons; thus, most of the children still experienced developmental disorder. Only few of them were free from developmental delay or found with normal development. The four aspects of stimulation on gross motor, fine motor, speech and language, and social independence show a correlation to one another. The results of analysis using multiple logistic regression test showed that there were significant effects of stimulation on developmental disorder in children. Stimulation on gross motor, fine motor, speech and language, as well as social independence affects developmental disorder. Hence, more stimulation will bring effects to children under five experiencing developmental disorder.

Table 1. Developmental disorder in the child growth and development polyclinic of RumahSakit Islam A. Yani Surabaya in 2017

Types of Developmental Disorder	Developmental Disorder		Total
	Suspect	Normal	
Motor Delay (MD)	8 (100%)	-	8 (100%)
Speech Delay (SD)	9 (60.0%)	6 (40.0%)	15 (100%)
Global Development Delay (GDD)	7 (100%)	-	7 (100%)
Total	24	6	30 (100%)

According to the cross tabulation showing the types of developmental disorder, only speech delay (40%) experienced a development by reaching a normal range.Speech delayis the type of developmental disorder which happened mostly in children under five, yet its level of success to improve the delay was better.

Table 2. The results of analysis using multiple logistic regressiontest on the aspects ofstimulationon gross and fine motor of the respondentsfound in the child growth and development polyclinic of Rumah Sakit Islam A.Yani Surabaya in 2017

Variable of Stimulation	β	P	RR	CI 95%	
				Low	High
Gross Motor	2.778	0.034	16.086	1.236	209.382
Fine Motor	3.298	0.037	27.063	1.224	598.25
Constants	-3.103	0.003	0.045		

The results of analysis using multiple logistic regression test showed that the variables which affectedsignificantly on developmental disorder is stimulation on gross motor in which the significance level was0.034 ($p < 0.05$), whereas stimulation on fine motor was 0.037 ($p < 0.05$).Hence, stimulation on gross and fine motoraffected developmental disorder in children under five.The value of RR variableof stimulation on gross motor was 16.086, while stimulation on fine motor was27.063 with interval value of trust for stimulation ongross motorat the low level was 1,236 and at thehigh level was 209.382. Whilst, the interval value of trust for stimulation on fine motor at the low level was 1.224 and at the high level was 598.225. The low level of interval value of trust was above 1. Therefore, both gross and fine motor were the risk factors of developmental disorder.

The results of analysis on stimulation on gross and fine motor showed that the value of Cox and Snell R Square was 0.335. It showed that the amount of effects of independent variable on dependent variable was 33.50%.

Table 3. The results of analysis using multiple logistic regression test on aspects of stimulation on speech, language, and social independence in the respondents found in the child growth and development polyclinic of Rumah Sakit Islam A.Yani Surabaya in 2017

Variable of Stimulation	β	p	RR	CI 95%	
				Low	High
Speech and language	2.889	0.036	17.968	1.214	265.883
Social independence	2.889	0.036	17.968	1.214	265.883
Constants	-3.261	0.002	0.038		

The results of analysis using multiple logistic regression test showed that the variable that affected evelopmental disorder significantly was stimulation on speech and language = 0.036 ($p< 0.05$), while stimulation on social independence was 0.036 ($p< 0.05$). Thus, stimulation on speech and language, as well as on social independence affected developmental disorder.

The value of RR for variable of stimulation on speech and language was 17.968, stimulation on social independence was 17.968with interval value of trust for stimulation on speech and language at the low level was 1.214 and at the high level was 265.883.The interval value of trust for stimulation on social independence at the low level was 1.214 and at the high level was 265.883. The low level of interval value for trust was above 1, the variables of stimulation on speech and language, as well as social independence were the risk factors of developmental disorder.

The results of analysis on the variable of stimulation on speech and language, as well as social independence showed that the value of Cox & Snell R Square was 0.366. It showed that the amount of effects of the independent variable on the dependent variable was36.60%.

DISCUSSION

According to Locke in Notoatmodjo (2007), response-taking resulted from stimulus happens during learning process. Learners, children under five found in the growth and development polyclinic of RumahSakit Islam A.Yani Surabaya, who often receive more responses will produce more responses. Among the respondents, some of them often gave stimulus which brought significant progress for child development[5].

A study conducted by Marischa (2016) shows that among 214 children aged between 0-5 years, 54 children (25.23%) experience gross motor delay. The results of study done by Yuliani (2016) about the correlation between stimulation and child development aged 4-5 years expose that all children aged 4-5 years (100%) have abilities of gross and fine motor development according to the age of development. However, 19.5% experience developmental disorders, especially in the aspect of speech and language, social independence as well[6].

In this study, the delay experienced by the respondents which can be overcome is speech and language disturbance. Santrock (2007) argues that at the age of 12 months, the speech center in the brain is balanced to produce one of the miraculous events in infancy; that is when a baby says his/her first word. The sparks of electrical activities in the brain happens approximately at the age of 1.5-2 years. The waves of activities relate to the increase of conceptual and language development[7].

Some mothers/respondents admit that they have tried to stimulate their children, yet they argue that their children have a problem to follow the stimulus provided by them. This probably happens because they give a little force so that the children will follow what they teach. Principally, stimulation should be given as if the children are playing; a force is not recommended. The most important point is that the mothers should give app reciation when the children are able to do what they teach. According to Graham and Stipek in Santrock (2007), appreciation to the competence and achievement made by children brings significant affects to the development of child's self-esteem[7].

CONCLUSION

The type of developmental disorder mostly experienced by the children under five (12-60 months) is speech delay. Most of them are suspected to have such developmental disorder because their mothers rarely give stimulation on gross and fine motor, speech and language, social independence as well.

The results of analysis using multiple logistic regression show that the variable which affects developmental disorder significantly is stimulation on gross and fine motor, speech and language, social independence as well. Hence, stimulation on gross and fine motor, speech and language, and social independence affects developmental disorder. Less stimulation given to children is likely to result in lower development from having developmental disorder to normal.

To optimize stimulation to achieve development according to the age, the parents/mothers need to spend their time to interact with their children and provide environment which enables them to play together to create a comfortable condition when giving stimulation.

The hospitals are expected to optimize the role to give counseling and education to the mothers/parents and maximize the role of PKRS (Health Promotion in Hospital), and activate parenting classes for the pregnant mothers for capacity building.

Aknowledgment

The Growth and Development Polyclinic of Rumah Sakit Islam A.Yani Surabaya, and the respondents as well as all those who have helped in completing preparation of this journal

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