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Original Research

The Correlation Between Stimulation, Nutritional Status and Child Development

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ABSTRACT

Introduction: Developmental disorder could be affected by many factors, such as stimulation and nutritional status. This study aimed to determine the correlation between stimulation, nutritional and development of children aged 3 to 6 years old.

Methods: The study design was an analytic survey with cross-sectional approach. Population was parents having children aged 3 to 6, as many as 419 in Sonorejo Village, the Work Area of the UPTD Puskesmas Grogol, Kediri Regency. Sample used were 109 respondents taken by simple random sampling technique. Independent variables were stimulation and nutritional status collected using questionnaire. Dependent variable was development of children aged 3 to 6 years old, collected using observation. Data were analyzed using ordinal regression test.

Results: Results showed roughly half of respondents (52, 47.7%), with good stimulation, those with normal nutritional status 80 respondents (73.4%) and having appropriate development 88 respondents (80.7%). There was an effect caused by stimulation and nutritional status for development of children aged 3 to 6 years. Results from the statistical test showed p value 0.000 for stimulation factor. This means that stimulation was a dominant factor for children's development.

Conclusion: Stimulation and nutritional status are very important for development of children aged 3 to 6 years old. This study suggested that parents should be more active in joining with health service centers so they can give an appropriate stimulation and increasing nutritional status for their children, so they can have optimal growth and development.

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INTRODUCTION

Parents always want their children to grow and develop optimally according to their age stages. Development concerns the development of language, social, fine motor or gross motor skills. In theory, it is mentioned that children can develop optimally requiring stimulation with the support of good growth, including normal nutrition. The problem is that there are still children who do not develop optimally according to their age (Fatimah, 2012). Nutritional status is the state of the body as a result of food consumption and use of nutrients (Astuti, Kapantow, & Ratag, 2015), while stimulation is the stimulation of the child's external environment in the form of exercise or play (Nursalam, Susilaningrum, & Utama, 2013).

Data show that among 200 million children under the age of 5 in developing countries, more than one-third of them have not fulfilled their potential for development (Kusuma, Syamlan, & Yoniko, 2013). According to UNICEF (2015), of 23.5 million children under five in Indonesia, 5 million or 27.5% experience growth and development disorders (Kementrian Kesehatan RI, 2016). Based on the records of the East Java Provincial Health Office, 2% or 1,700 children under five suffer from weight disorders that do not match age, intelligence or mental retardation. Based on data from the Kediri District Health Office in 2016, from 14,697 children under five, there were as many as 352 toddlers (2.4%) whose development was not appropriate (experiencing deviations). In East Java, based on the results of the early detection of growth and development in 2016, out of 2,321,542 toddlers and preschoolers,63.48% of 3,657,353 children under five showed poor development (Dinkes Jatim, 2010). Based on the 2016 monthly nutrition report of the UPTD Puskesmas Grogol, it is known that the results of the early detection of growth and development of 3,397 toddlers showed 63 toddlers (1.8%) having inappropriate development. The results of the nutritional status assessment did not reveal any cases of malnutrition, but there were 5 toddlers (0.15%).with malnutrition status

The results of a preliminary study in the Sonorejo Village, the Work Area of the UPTD Puskesmas Grogol, Kediri Regency, found three children (20%) with developmental disorders three children (20%) not independent, four children (26.7%) with gross motor delay

and five children (33.7%) with delayed development of fine motor skills. Parents who provide daily stimulation to their children were as many as three people (20%), rarely giving stimulation as many as 9 people (60%) and never giving as many as 3 people (20%).

There are four risk factors that affect child development, namely nutritional status (severe chronic malnutrition), inadequate early stimulation, iodine deficiency and iron deficiency anemia. One important risk factor related to the interaction of mother and child is the provision of early stimulation (Ritayani, 2010). According to Soetjiningsih, there are two factors that influence the growth and development of children, namely genetic (intrinsic) and environmental (extrinsic) factors. Environmental factors concern the psychological and social environment, such as nutritional status, the role of parents, the active role of children and the education of parents (Soetjiningsih, 2013).

In order for a child's development to proceed normally, parental involvement is required through early care programs in the form of coordinated services and fostering partnerships between experts and families (Soetjiningsih, 2013). Parental assistance is needed in monitoring the child's growth through monitoring the growth and development of children in the Posyandu every month (Warisyah, 2015). For growth and development, adequate food substances are needed. As the age of the child grows, the variety of food provided must be nutritionally complete and balanced, so it is important to support the child's growth and development (Pratiwi, Masrul, & Yerizel, 2016). This study aimed to determine the correlation between stimulation, nutritional and development of children aged 3 to 6 years old.

MATERIALS AND METHODS

This study uses analytic survey research methods, namely research that tries to explore how and why health phenomena occur. In this analytic survey research, research is not conducted on all objects (population), but only a portion of the population (sample). The research design used was cross-sectional, namely analytic survey research in which the collection of independent and bound variable data was carried out in one measurement and at the same time (Notoatmojo, 2018).

The location in this study was in Sonorejo Village, Grogol District, Kediri Regency. The study was carried out in July 2019. The independent variables were stimulation and nutritional status and the bound of children's development was collected by questionnaire and observation sheet (Prescreening Developmental Questionnaire). Statistical analysis was performed using statistical techniques using the Spearman correlation test and multiple linear regression.

This survey was approved by the ethics committee of Institut Ilmu Kesehatan STRADA Indonesia (Number: 481/KEPK/IV/2019). The participants were assured that their engagement was voluntary, and that anonymity, privacy, and confidentiality of the data were guaranteed. Furthermore, they were informed about the purpose and the method of the study before signing a written informed consent. The questionnaires were distributed to eligible participants in Sonorejo Village, Grogol District, Kediri Regency, and respondents were asked to complete and return them at the same time.

RESULTS

This study used a sample of 109 respondents. Univariate analysis results found that out of a total of 109 respondents, almost half conducted early stimulation in the good category with 52 respondents (47.7%), 80 respondents (73.4%) had nutritional status in the normal category and almost all respondents (88, 80.7%) had a development in the normal category

The results of bivariate analysis show the effect of early stimulation on child development (Spearman *p value* 0.000<0.05, so H0 is rejected). The level of influence is low and positive (r = +0.392), meaning that the better the early stimulation, the more normal child development, and vice versa; there is the influence of nutritional status on child development in Sonorejo Village Grogol District Kediri Regency 2019 (*p value* 0.002 <0.05, thus H0 is rejected). The level of influence is low and positive (r = +0.300), meaning that the more normal the nutritional status, the more normal the child's development, and vice versa.

Multivariate analysis results found that the most dominant factor between early stimulation and nutritional status on child development is the stimulation variable (*p value* 0.000 <0.05, thus H0 is rejected).

Table 1. Ordinal Regression Test

	Sig	R	Sig Simultan
Stimulation	0.000	0.202	0.000
Nutritional Status	0.254		

DISCUSSION

The Out of a total of 109 respondents, nearly half (52, 47.7%) conducted early stimulation in the good category Stimulation is stimulation from the child's external environment in the form of exercise or play (Nursalam et al., 2013). There are several factors that influence the success of stimulation, including individual basic abilities, health, family, environment, and socioeconomic conditions. It is also influenced by the time when the initial stimulation is given, for how long, and how to it is done. The ability of children's development has a distinctive characteristic, which is to have a fixed pattern and occur sequentially, so that early stimulation must be directed and emphasized first for the formation of basic abilities before developing cognitive-academic abilities and more complex behaviors (Hati & Lestari, 2016).

If almost half of respondents do early stimulation in the good category, then this can be influenced by various factors. The environment (family, neighbors, friends and other people around them) has a string importance for children. This can happen because, at that age, children are already able to be invited to communicate and be funny, causing adult interest to randomize joking and other behaviors that consciously or unconsciously result in an excellent stimulation for development child (Saputro & Talan, 2017). Mother's age is one of the factors that influence stimulation. Based on the analysis results, it was found that most respondents aged 20-35 years with early stimulation were good, namely 44 respondents (40.4%). This can happen because parents aged 20-35 years are at their best physical condition so that they physically have the ability to provide early stimulation to their children. Psychologically, people aged 20-35 years are also in a period of maturity, and mentally also in their best condition so that they are also willing and able to provide early stimulation for their children's development.

Educational background of the mother is one of the factors that influence stimulation. Based on the analysis results, it was found that the most respondents were junior high school graduates with early stimulation, including the sufficient category, namely 30 respondents (27.5%). This is because, despite the background of junior high school education, respondents still had limited knowledge and insight, including insights on early stimulation for the development of their children, resulting in providing early stimulation but only up to the good category.

Number of children in family is one of the factors that influence stimulation. Based on the analysis results, it was found that the most respondents had or two siblings with early stimulation, which included both categories, respectively 26 respondents (23.9%). This is because, due to the relatively small number of children, parents are able to give maximum attention to their children. Included in this case, efforts to provide early stimulation for the development of their children can also be done well because it does not take time to pay attention to other children if the condition of the family is as a large family.

Of the total 109 respondents, most respondents (80, 73.4%) have nutritional status in the normal category. Nutritional status is an expression of balance in the form of certain variables, or the embodiment of nutrition in the form of certain variables. For example: endemic goiter is an imbalance of iodine intake and expenditure in the body. The point is that nutritional status is an expression of a state of balance in the form of certain variables (Aramico, Sudargo, & Susilo, 2013). Nutritional status is also expressed as a state of the body as a result of food consumption and use of nutrients, with four classifications, namely poor nutritional status, poor, good, and more (Munawaroh, 2016). Nutritional status is the state of the body as a result of food consumption and use of nutrients (Astuti et al., 2015). Nutritional status can be influenced by two kinds of factors, namely food consumption and health. Food consumption includes nutritional factors in food, the presence or absence of feeding programs outside the family, family finance and eating habits. Health factors include maintaining health and the physical and social environment (Aramico et al., 2013).

The majority of respondents have nutritional status in the normal category; this can be influenced by various factors, such as the presence of food outside the family, such as feeding when there are meals at birthdays, weddings, salvation, groups recitation, religion group and other activities. In addition, it is also related to the purchasing power of families who, at this time, generally have a very good ability to buy food for their children. This condition is very different compared to poor families, whose purchasing power for food supply is generally low so that they do not meet the requirements of quality and quantity.

Children's eating habits are one of the factors that influence normal nutritional status. In general, among families who are currently economically capable, then eating habits are not eating in a potluck manner, but rather thinking about the best nutritional elements for children, such as rice with tofu, soy sauce, crackers, meat, fish and various other dishes that are highly nutritious. If this habit proceeds continuously, it leads children to get the sufficient nutrients needed for their growth. As a result, in the long run, it will also affect the nutritional status, so that it includes normal nutrition (Siwi, 2015).

Healthcare is another factor that also affects the nutritional status of children. Currently, the awareness of parents to generally carry out preventive measures against diseases has been done well, such as immunizations. If clean living habits have also been done well with a pattern of bathing at least twice a day, and keeping the house clean and others is also good, then the child's immune system is also good, so the child is not susceptible to disease.

Environmental factors can also affect the nutritional status of children. The principle of influence is the same as the preventive measures mentioned above. Social factors (certain traditional foods, especially sago, corn, cassava, or abstinence from certain foods, etc.) can also affect the nutritional status of children. This is related to the source of carbohydrates, proteins, fats and various vitamins that cannot be consumed, thereby reducing the nutritional status of children. In the community of Sonorejo Village, Grogol Subdistrict, Kediri Regency, in general, there are not many who practice abstinence from eating, so there are no food restrictions for their children. Staple food is generally in the form of rice with side dishes, but there is also a lot of meat and fish, so that the nutritional status of children is normal.

Various efforts can be realized because it is supported by the characteristics of mothers, such as age, education and number of children. Based on the results of the analysis, it was found that mothers aged 20-35 years with normal nutritional status were as many as 69 respondents (63.3%). This condition supports the mother's ability to work to earn an income, so that it can help her husband to increase family income. This will affect food consumption patterns, especially nutrient intake in children. Thus the nutritional status of children will increase.

Of a total of 109 respondents, early all (88, 80.7%) had a normal category of development. Development is the increased ability (skill) in the structure and function of the body that is more complex in an orderly and predictable pattern, as a result of the maturation process. This concerns the process of differentiation of body cells, body tissues, organs and organ systems that develop in such a way that they can fulfill their functions, including the development of emotions, intellect and behavior as a result of interaction with the environment (Soetjiningsih, 2013). Development is an increase in the ability of body structures and functions that are more complex. Development involves the differentiation of cells, tissues, organs, and organ systems that develop in such a way that each can fulfill its function (Chamidah, 2009).

Given the majority of respondents are found to have normal development, this can be caused by various factors that support the development of children under five. In theory, it has been explained that children's development can be influenced by various factors, both internal and external. External factors in this case are also influenced by environmental factors. The form of the environment in question can include the physical environment and social environment of children under five. The family environment also influences the development of children under five (Fazrin, Saputro, Chusnatayaini, & Ningrum, 2017).

In accordance with the results of research successfully obtained by researchers, this development could be due to a relationship with hereditary factors. This means that children are able to develop properly because the average parent also has a pretty good intelligence. This can be assessed through communication between researchers and mothers of children under five. In the context of general knowledge, it looks quite good and, in the context of child development, generally, parents of toddlers already have a pretty good understanding base. Generally, they already know that the child's development must be trained (given stimulation). Without this effort, they have realized that children will be less optimal in their development. Therefore, parents also always train their children to play,

they are always invited to talk, tell stories, sing, and write rudimentarily, all of which are efforts to stimulate early.

Based on the results of the study, it was found that almost all mothers were aged 20-35 years (95,87.2%). This age group is a productive age group so that mothers can easily monitor the development of their children and mothers will actively seek information related to the development of their children, coupled with the many social media that they can access. From other social media, mothers can easily get information about the development of toddlers. Information about children's development can be practiced by the mother toward her child so that the child's development is in accordance with the stage of age.

Another factor which is in accordance with the theory and which also supports the development of children is the number of children. In accordance with the results of this study, it was found that out of a total of 109 respondents almost half (56, 42.2%) had one sibling. This means that, in the family there are two children, thus the mother already has experience with previous children so they can monitor the development of toddlers. Based on experience with the first child, the mother already has the knowledge to monitor the development of toddlers, so that it grows normally according to the child's age.

Effects of Early Stimulation on Development

It is known that there is an influence of early stimulation on the development in Sonorejo Village Grogol Subdistrict, Kediri Regency in 2019 (p value 0.000 <0.05, thus H0 is rejected). The level of influence is low and positive (r = +0.392), meaning that the better the early stimulation, the more normal the child's development, and vice versa.

The purpose of providing early stimulation to children is "to help the child so that he can achieve a good level of development, so that there is no developmental delay, train children to encourage mastering their developmental tasks according to their age level" (Hidajaturrokhmah & Saputro, 2016). Stimulation that is given correctly will provide benefits for child development. This is explained that "the stimulation given correctly to children will be able to direct the child's development, prevent the occurrence of growth retardation, development and educate the child so that the child reaches an optimal level of development" (Kementrian Kesehatan RI, 2016).

It is found that there early stimulation influences child development, so that the child gets stimulation from the external environment in the form of exercise or play. This is in accordance with existing theories that stimulation given correctly to children will be able to direct the child's development, prevent the occurrence of growth retardation, and assist in the development and education of the child so that the child reaches an optimal level of development. There are also those who say that children who receive targeted stimulation will develop more quickly than children who lack stimulation. This condition also occurs in the results of this study in that respondents with good early stimulation and normal development were as many as 49 (45.0%). This proves that early stimulation is indeed a predisposing factor for children's development.

Effect of Nutritional Status on Development

It is known that there is an influence of nutritional status on child development in Sonorejo Village, Grogol District, Kediri Regency in 2019 (p value 0.002 <0.05, thus H0 is rejected). The level of influence is low and positive (r = +0.300), meaning that the more normal the nutritional status, the more normal the child's development, and vice versa.

To grow and develop, children need adequate food substances. Sulistijani revealed that, as a child ages, the variety of foods must be nutritionally complete and balanced to support their growth and development (Pratiwi et al., 2016). Food must contain energy and all nutrients (carbohydrates, protein, fat, vitamins and minerals) needed (Kania, 2007). Fulfillment of good nutrition plays an important role in achieving optimal growth, including the growth of the child's brain. Lack of one of the nutrients can lead to impaired growth and development of children. Associated with brain performance, malnutrition can reduce the level of work of certain neurotransmitters and affect children's development (Chamidah, 2009).

The influence of nutritional status on children's development is due to the development needed by brain performance. Growth and development itself requires nutrition from food. If the food given to children is lacking, both in quality and quantity, then the nutrients to support brain growth and development are also lacking (Briawan & Herawati, 2008). As a result, the power of brain development is also reduced, so that the brain does not develop optimally and eventually also results in children's developmental disorders. Conversely, when the intake of nutritious foods can be fulfilled, the growth and development of the brain can occur optimally, so that the child's mind is also developing well. This will support the child's development in accordance with the stages of his age and take place optimally.

CONCLUSION

The most dominant factor between stimulation and nutritional status of a child's development is that stimulation due to the achievement of development is more prioritized by stimulation. Through stimulation, the child will practice the pattern of thinking, so that more optimal growth is seen from the psychological aspects. On the other hand, nutritional status is not a factor that is directly related to psychological development. Generally, the greater the nutritional status, the more the physical condition grows, i.e. the greater the physical condition, the more it indirectly also supports the intelligence of children. It can be interpreted that more stimulation is needed to support child development.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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