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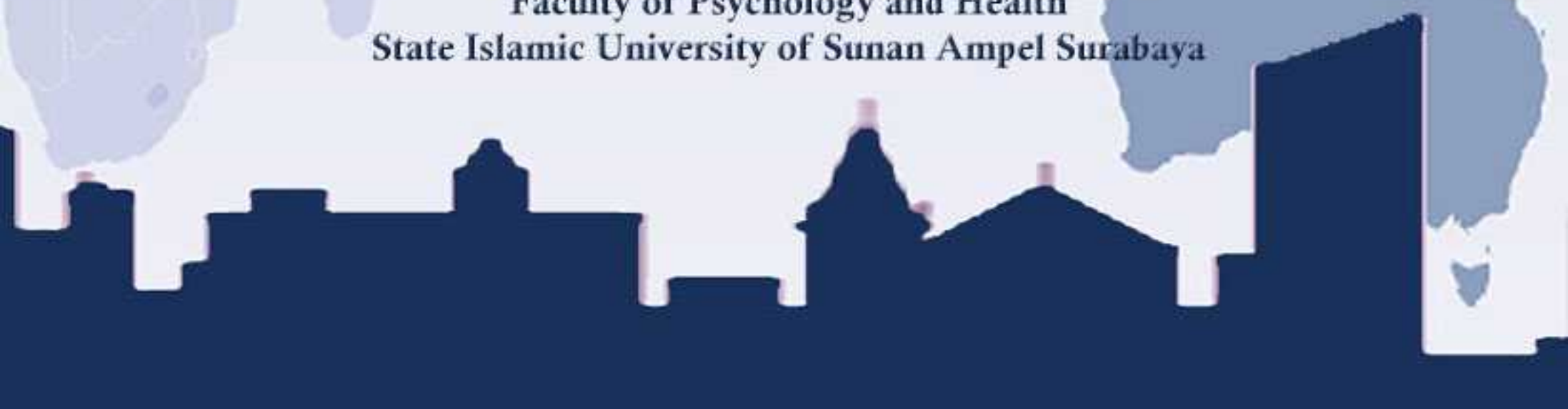
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Determinants of Toddler's Stunting in Coastal Area of Surabaya, East Java Indonesia

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Abstract Many factors influence stunting in the coastal area. This research aimed to analyze factors which have the influence of stunting toddler in the coastal area. This research used logistic regression analysis design with 145 pairs of child-mothers in coastal area Surabaya taken by stratified random sampling technique. Factors of economic status, level of education, genetic, and birth height is taken by questionnaire. Stunting measured by comparison of body weight and height of the toddler. The result shows that factor genetic of father and factor genetic of the mother has strong influence to stunting. Analyse was used ordinal regression with a sig. 0,007 (father's genetic) and sig 0,047 (mother's genetic). The Genetic of parents were very important to improve stunting of the toddler in a coastal area. What becomes the recommendation of this research was stunting can be saved with high selection couple if they want to get married.

1 INTRODUCTION

Coastal areas have a characteristic and unique natural resources. As a fish-producing region, coastal areas have potential in improving health status, especially nutrition problems. Nutritional content in fish if managed properly should be able to improve nutritional status of children. Several problem in child nutrition still founded in coastal area of Surabaya. Nutritional status varied in range severely wasting till fat.

Nutritional problem in coastal area influenced by socioeconomic status. The previous study, (Hien & KamS, 2008) found that maternal, socioeconomic and environment factor have influenced in nutritional status of children under 5-years old in Vietnam.

The coastal region of Surabaya has a diverse community character. Its population consists of various tribes and occupations. In addition, the lifestyle of coastal communities surabaya much influenced urban lifestyle so that the dissemination of information and technology is very fast. In addition, the level of education in coastal communities also varied from basic education to higher education that affect the attitude, the pattern of thinking and behavior of the community in nutrition management in children.

Children's physical growth patterns are among the tools used to assess a population's nutritional status. Physical growth itself is regulated by two major factors: genetics and the environment (Adair LS, 1997).

Although the quantity and quality of food are the main environmental determinants of good nutritional status, children's physical and psychosocial surroundings also impact on their growth. Stunting (i.e. linear growth faltering) is an important public health problem for children living in environments with poverty, poor nutrition and high prevalences of infectious diseases such as found in developing countries (Vella V, Tomkins A, Borghesi A, Migliori GB, 1994)

Socio-economic status such as the mother's education and occupation, household income and health expenditure may influence stunting levels indirectly (Ukwuani FA, 2003), whilst a number of factors may be directly causative, including micronutrient deficiencies, inadequate protein intake, intrauterine malnutrition, maternal stature and infections (Saleemi MA, Ashraf RN, Mellander L, 2001)

The income level of coastal population surabayaalso varied. This may also affect the ability of the family in selecting the daily food menu for their children so that there are varied nutritional status ranging from undernutrition to overnutrition children.

This is different from other coastal areas in Indonesia which are far from urban areas. With these various potentials, Surabaya coastal areas should be more able to overcome the problem of nutrition than other coastal areas in Indonesia (Kurniawan, Muslimatun, Endang, & Sastromidjojo, 2006), found that adolescent in peri urban coastal area of Indonesia have anemia and iron deficiency.

Based on the results of field observations, environmental factors in coastal areas Surabaya still cause many problems. Many found waste discharged to the coast in coastal areas, fish populations are decreased so that fishermen are looking for fish in the territorial waters farther from the coast. Community hygiene is also disrupted where there are still residents who do not have toilets. This has been overcome by the government by building public latrines, but some are still far from the reach of residents. Some residents defecate directly to the beach, whereas the beach is still a source of water for other residents. The incidence of diarrhea and skin diseases are still widely encountered. Therefore it is necessary to analyze the model related factors that affect the nutritional status of coastal areas Surabaya. This study aims to determine the model of the factors that can affect the nutritional status of children under five in the coastal area of Surabaya.

2 METHOD

The data collecting of this research was questionnaire to measure stunting. We only use weight-for-height to make assessment the whole of stunting.

Factors that have influence of stunting measured by questionnaire which contain 4 factors. We take data by questionnaire for 4 factors, economic status, level of education, genetic, and birth height.

Data collection conducted by door to door to interview for questionnaire data. The measurement of stunting held by measure body weight and height of children. After selection by stratified random sampling we use logistic regression statistic test to analyze factor that affect nutritional status.

3 RESULT AND DISCUSSION

Result

1. Toddler's Nutritional Status in Coastal Area of Surabaya

Table 1 presented about stunting of toddler based on weight-for-height in coastal area Surabaya.

Table 1: Stunting Based on Weight-For-Height of Toddler

Stunting Status	Frequency (f)	Percentage (%)
Normal	76	52.4
Stunting	69	47.6
Total	145	100

Table 1 showed the stunting status normal mostly 76 toddler 52.4% than stunting 69 toddler 47.6% is stunting

2. Economic Status in Coastal Area Surabaya

Table 2: Economic Status of Parents

Economic Status	Frequency (f)	Percentage (%)
Low	60	41.4
High	85	58.6
Total	145	100

Table 2 showed about economic status in coastal area in Surabaya. Most of parents have a high income (85 toddler, 58,6%). But 60 parents get low income (41,4%).

3. Level of Education

Table 3.1 Level of father's Education

Level of Education	Frequency (f)	Percentage (%)
Low	47	32.4
High	98	67.6
Total	145	100

Table 3.1 presented the level of father's education in coastal area mostly in high level 98 fathers (67.6%) and 47 fathers (32.4%) low level education.

Table 3.2 Level of Mother's Education

Level of Education	Frequency (f)	Percentage (%)
Low	58	40
High	87	60
Total	145	100

Table 3.2 presented the level of education mother in coastal area mostly in high level 87 mother (60%) and 58 mother (40%) low level education.

4. Genetic in Coastal Area Surabaya

Table 4.1 Father's genetic

Father's Genetic	Frequency (f)	Percentage (%)
low	115	79.3
normal	30	20.7
Total	145	100

Table 4.1 showed that father's genetic mostly in low level 115 father 79.3 % an 30 father (20.7%) normal.

Tabel 4.2 Mother's genetic

Mother's Genetic	Frequency (f)	Percentage (%)
low	19	13.1
normal	126	86.9
Total	145	100

Table 4.2 showed that genetic of mother mostly in normal level 126 mother 86.9 % and 19 Mother (13.1%) Low.

5. Birth Height Toddler in Coastal Area Surabaya

Table 5 showed that the most educational status of mother is high school (55 mother, 52,9%) and only 2 mother (1,9%) have educational status college / university. Another mother educational status in elementary school (18 mother 17,3%) and junior school (29 mother, 27,9%)

Tabel 5. Toddler's Birth Height

Toddler's Birth Height	Frequency (f)	Percentage (%)
Low	5	3.4
Normal	140	96.6
Total	145	100

6. Factors of Toddler's stunting status in Coastal Area of Surabaya

Tabel 6. Statistical result on influence between variables

Variable	Wald	Sig.	(CI 95% for Exp)
Father's education	0.067	0.796	0.882 (0.342 – 2.276)
Mother's education	1.034	0.309	0.624 (0.251 – 1.549)
Economy	0.899	0.343	1.411 (0.692 – 2.877)
Birth Height	0.399	0.527	0.537 (0.078 – 3.688)
Father's gen	7.382	0.007	3.538 (1.422 – 8.802)
Mother's gen	3.947	0.047	3.392 (1.017 – 11.317)

The variable in the table above has showed that independent variables of Father's Genetic and Genetic Mothers have P value of wald test (Sig) <0.05 , meaning that each variable has a significant partial effect on Y in the model. X5 or genetic father has a Sig Wald value of $0.007 <0.05$, thus rejecting H0 or which means that the Father's Genetic has a significant partial effect on the incidence of stunting.

X6 or maternal genetics has a Sig Wald value of $0.047 <0.05$ so that it rejects H0 or means that the mother's genetics has a significant partial effect on the incidence of stunting.

The amount of influence is indicated by the value of EXP (B) or also called ODDS RATIO (OR). Father's genetic variables with OR 3,538 then father's genetic factor (code 1 independent variable), are more at risk of experiencing stunting (code 1 dependent variable) as much as 3,538 times compared to people who do not have father's genetic factors (code 0 independent variable). Value B = Natural Logarithm of $3,538 = 1,264$. Because the value of B is positive, the genetic factor of the father has a positive relationship with the incidence of stunting.

Family history variables with OR 3.392 then maternal genetic factors (code 1 independent variables), were more at risk of experiencing stunting (code 1 dependent variable) as much as 3.392 times compared to people with no maternal genetic factors (code 0 independent variables). Value B = Natural Logarithm of $3,392 = 1,221$. Because the value of B is positive, the mother's genetic factors have a positive relationship with the incidence of stunting.

Discussion

Poor daily food consumption of children, tend to difficult to achieve normal nutritional status. It has correlation in nutrition less than needs. Toddler have various physical activity and need nutrition for their growth and development. If their daily food consumption less than their needs, they tend to more thin and difficult to gain their weight. The incidence of anemia, worsen thin condition. Kurniawan, found that thinner children has higher anemia and iron deficiency in coastal area in Indonesia (Kurniawan et al., 2006)

Toddler have difficulties of feeding. Toddler choose instan noodle or another junk food which contain more carbohydrate than vegetable or protein. Characteristic some mother in coastal area Surabaya show that they don't make strong effort to give nutrition if their children difficult to eat. Mother should make various persuade to make their children want to eat their food. If they don't, the children only eat in small amount of food.

The previous study found that the prevalence of early childhood stunting and the number of people living in absolute poverty have closely associated with poor cognitive and educational performance in children and use them to estimate that (Grantham-McGregor et al., 2007).

Otherwise, some children have more nutrient than their needs. Almost mother give additional milk

(not breast milk) for their children although their children have normal nutritional status and fat. Almost children with fat, still have formula milk in their diet. Mother believe that children have to eat more, this situation will bring their children become overweight and obese.

Olivares, found that food consumption in school age children have influence in nutritional status. Daily food consumption have a stronger than daily activity (such as TV time). Although they have TV time, intake of food with dense energy and vegetable or fruit only a risk factor of obesity. But intake of milk have strong influence in obesity of children in Chili(Olivares et al., 2004).

The contain of formula milk, have more than their need (such as lipid). Some children also have alergy, this incident higher in children with formula milk, it can cause some desease just like diarrhea and cought.The incident of deasease will bring decrease of body weight.

The coastal community in Surabaya is very complex. From the environmental perspective it is found that water pollution are still happening. Many found trash on the beach area. This disturbed sanitation can trigger the emergence of various diseases, especially in toddlers. Food hygiene can be contaminated with poor sanitation.

D'Agnes found that food security in coastal area of philipines will be achieved more quickly if there is together implementation between coastal resources management and reproductive health(D'Agnes, Castro, D'Agnes, & Montebon, 2005).

4 CONCLUSIONS

Based on this research, we assume that the genetic factor from father and mother have strong influence to stunting. in fact this can be overcome by providing good nutrition and can invite children to do motor activities that can increase height in the age of growth.

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