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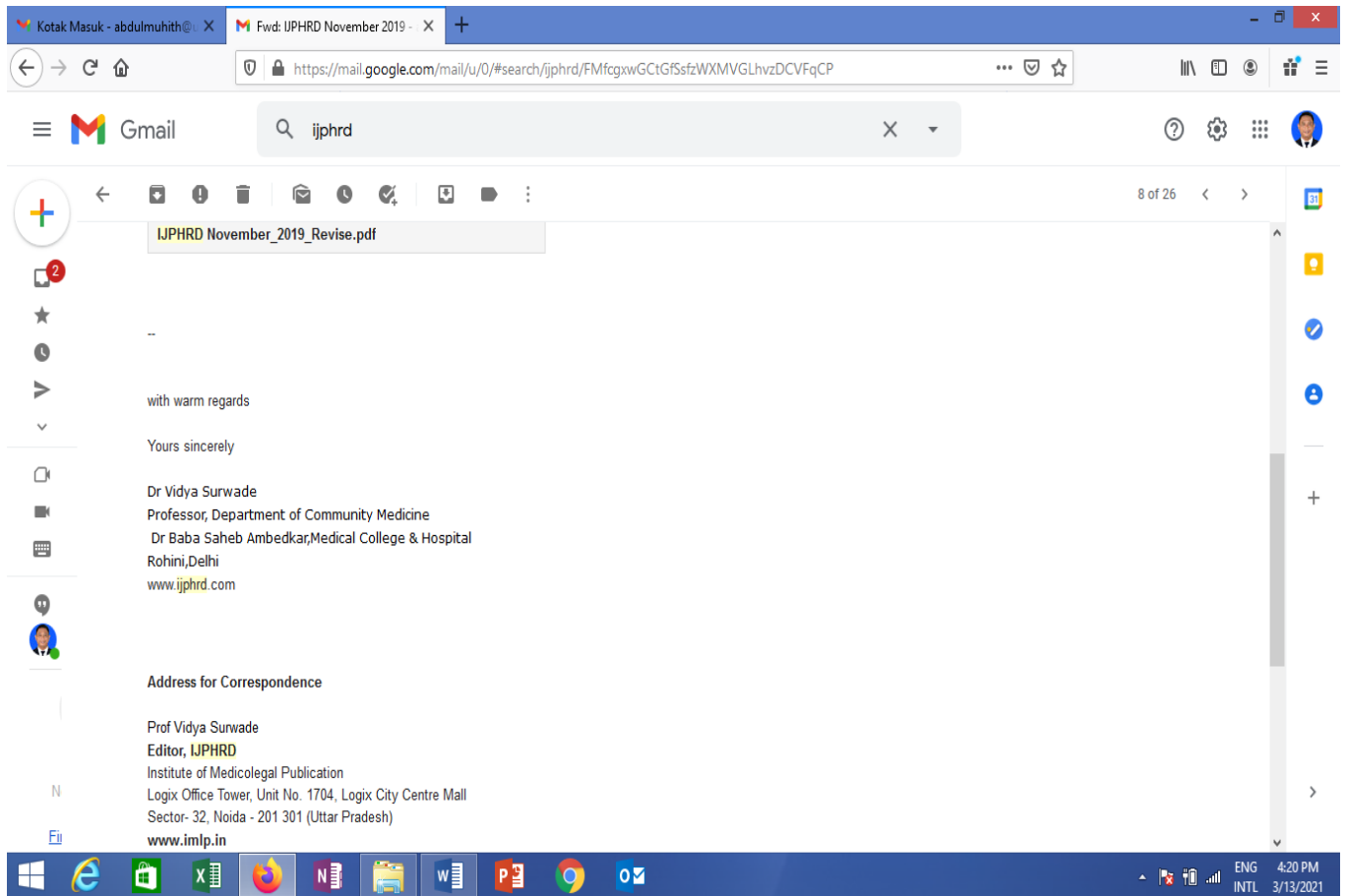
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Yours sincerely

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Determinant Factors Affecting the Nutritional Status of Children in Regional Health Center of Gresik

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Abstract

Preschool children are at risk developing PEM as they are not breastfed and the food consumed may not fulfill the nutrients need for their progressive growth. Nutritional status of preschool children is indirectly associated to the socioeconomic and hygiene status and directly associated to the level of consumptions and infections. The aims of this research is to analyze the associations between socioeconomic factors, hygiene, level of consumptions, and infections with the nutritional status of preschool children in Gresik District. The result of statistical analysis using the Multiple Linear Regression Test showed that maternal education, knowledge, environmental hygienity and protein energy intake have a significant influence on nutritional status of children, while maternal parenting, URI incident and diarrhea and family income variables have no significant influence on nutritional status. Early detection through intensification monitoring of toddler growth at posyandu, followed by determination of nutritional status by village midwife or other health worker. It is a striving for a dynamic food and environment where monitoring of critical indicators of resources, availability and access to food and nutrition at all levels of society required.

Keywords: *Nutritional status, maternal education, knowledge, hygienity, protein energy, children aged 24-60 months.*

Background

Underweight or poor nutrition in infancy and children, especially at the age of less than 5 years can lead to disruption of physical growth and child intelligence.¹ Growth of brain cells takes place very quickly and will stop or reach the perfect stage at the age of 4-5 years.² Rapid brain development can only be achieved if the child has good nutritional status.³ Growth monitoring of infant development is very important to know the existence of early infant growth disorder, by way of weight measurement as the best way to assess the nutritional status of children every month so that child growth will be monitored. How to assess nutritional status can be done with anthropometric, clinical, biochemical, and biophysical measurements. Anthropometric measurements can be performed with several measurements: weight measurement, height, upper arm circumference, and so on. One indicator of health in children under five years old (toddlers) can be seen from the nutritional status. Nutritional status of children can be measured by age, weight (BW), height

(BH). Monitoring the nutritional status of children under five can be seen from three indicators of anthropometry, namely: weight by age (BW/A), body height by age (BH/A) and weight by body (BW/BH). Based on the indicator of BW/BH, nutritional status is divided into 4 namely malnutrition, underweight, good nutrition, and fat. Based on the results of Basic Health Research in 2013, it is known that the percentage of underweighted BW/A status by province in Indonesia is 33 percent higher, the prevalence of malnutrition in infants (BW/BH) by province in Indonesia is 18,7 percent in 2013. Meanwhile, the percentage of underweight and underweight nutrition (BW/A) according to regencies and municipalities in East Java Province in 2013 was 4.9% and nutritional status less 14.2%.⁴

Based on the data of PSG data from the Health Office of Gresik Regency in 2016, it shows that percentage of nutritional status under fives index BC/U in 2014 until 2015 for under-five children with malnutrition decreased significantly from 5.43% to 0.7% but in year 2016 increased slightly to 0.98%, while under-fives

with underweight nutrition continued to increase from year to year, ie in 2014 by 0.26% (203 under-fives), by 2015 soaring, equal to 4, 9% (3907 under-fives), and in 2016 increased to 5.93% (4547 children under five). Malnutrition events need to be detected early on through intensification of infant growth monitoring at posyandu, followed by determination of nutritional status by village midwives or other health workers. Malnutrition data in East Java is based on 2 categories ie by indicator comparing BW/A and second category is compare BW/BH.

Research Methodology: This research is a quantitative research using analytical survey with cross sectional design or design. Cross-sectional survey is a study to study the correlation dynamics between risk factors and effects by approach, observation or point time approach meaning that each subject is observed only once and the measurement is done on the character or variable status subject at the time of examination. The population of this study is all mothers who have children under five in the working area of Puskesmas Kabupaten Gresik. Respondent in this research is mother toddler, while sample unit is toddler age 24-60 month amount 1315 balita. The minimum sample size in this

study was 90 mothers and children aged 24-60 months, taken by proportional random sampling. Respondents were mothers of the sample. The statistical test used is Multiple Linear Regression. The independent variables in this research are education, mother’s knowledge, environmental higines level, protein energy intake, family income, mother care pattern, and incidence of URI and diarrhea with nutritional status of children. Dependent variable in this study is nutritional status of children aged 24-60 months.

Research Results: Table 1 shows that of 90 respondents most of the mothers have high school education background and normal nutritional status of children (64.4%). Result of data analysis using t test got t count equal to 2,526 and $p = 0.013$, so $p < 0.05$. This means that there is significant influence between mother education with nutritional status. The level of maternal education determine their attitudes and actions in dealing with various problems and has an important role in the health and growth of the child. This can be demonstrated by the fact that children from mothers with higher educational backgrounds will have a better chance to live and grow better and more readily accept broader insight into nutrition.^{5,6}

Table 1. Cross-tabulation of maternal education and nutritional status of children

		Nutritional status				Total (person) Percentage (%)
		Bad	Insufficient	Normal	Fat	
Education	SD	3	0	0	0	3
		3.3%	0.0%	0.0%	0.0%	3.3%
	SMP	0	8	4	0	12
		0.0%	8.9%	4.4%	0.0%	13.3%
	SMA	0	1	58	10	69
		0.0%	1.1%	64.4%	11.1%	76.7%
	PT	0	1	3	2	6
		0.0%	1.1%	3.3%	2.2%	6.7%
Total		3	10	65	12	90
		3.3%	11.1%	72.2%	13.3%	100.0%

Table 2 shows that of 90 respondents most mothers have high income is >Rp. 1,200,000 and her children have normal nutritional status (67.8%). The result of data analysis using t test got t count equal to 0.561 and $p = 0.567$, so $p > 0.05$. This means that there is no significant influence between family income with nutritional status of children. Some studies highlighted the relations

of family income and nutritional status.^{7,8} Thus the incidence of nutritional disorders is not only found in families who earn less but also in high-income families. This situation indicates that ignorance of the benefits of food for the health of the body causes the poor nutritional quality of family food, especially toddlers.

Table 2. Cross-tabulation of income family and nutritional status

			Nutritional status				Total
			Bad	Insufficient	Normal	Fat	
Family income	Low (<IDR 1.200.000)	Count	136.928	0.000	4	2	11
		% of Total	1.1%	4.4%	4.4%	2.2%	12.2%
	High (>IDR 1.200.000)	Count	2	6	61	10	79
		% of Total	2.2%	6.7%	67.8%	11.1%	87.8%
Total		Count	3	10	65	12	90
		% of Total	3.3%	11.1%	72.2%	13.3%	100.0%

t_{count} = 0.561, p = 0.567

Table 3 shows that of 90 respondents most mothers have enough knowledge and normal nutritional status (60%). The result of data analysis using t test obtained t count equal to 5,729 and p = 0.000, so p < 0.05. This means that there is significant influence between mother’s knowledge about nutrition with nutritional status of children. Nutrition knowledge of parents is one of the

factors that affect child nutrition.⁹ Mother’s knowledge determines the behavior of food consumption, one of them through nutrition education so that will improve the habit of food consumption.¹⁰ Lack of knowledge about nutrition or the ability to apply in everyday life is an important cause of nutritional disorders.

Table 3. Cross-tabulation of mother’s knowledge about nutrition with nutritional status.

			Nutritional status				Total
			Bad	Insufficient	Normal	Over	
Knowledge	Less	Count	0	4	0	0	4
		% of Total	0.0%	4.4%	0.0%	0.0%	4.4%
	Enough	Count	2	5	54	0	61
		% of Total	2.2%	5.6%	60.0%	0.0%	67.8%
	Good	Count	1	1	11	12	25
		% of Total	1.1%	1.1%	12.2%	13.3%	27.8%
Total		Count	3	10	65	12	90
		% of Total	3.3%	11.1%	72.2%	13.3%	100.0%

t_{count} = 5.729, p = 0.000

Table 4 shows that of 90 respondents almost half of the mother’s parenting pattern is enough and normal nutritional status (42.2%). The result of data analysis using t test got t count equal to 0.553 and p = 0.582, so p > 0.05. This means that there is no significant influence between mother care pattern with nutritional status of children. Patterns of parenting also contribute to the

nutritional status of children, one of the patterns of care related to the nutritional status of children is the pattern of feeding.¹¹ In addition to eating patterns, mother’s health patterns also affect the health status of children and will ultimately affect the child’s nutritional status indirectly.

Table 4. Cross tabulation of mother's parenting with nutritional status

			Nutritional status				Total
			Bad	Insufficient	Normal	Fat	
Mother's parenting	Less	Count	0	2	19	2	23
		% of Total	0.0%	2.2%	21.1%	2.2%	25.6%
	Enough	Count	1	5	38	2	46
		% of Total	1.1%	5.6%	42.2%	2.2%	51.1%
	Good	Count	2	3	8	8	21
		% of Total	2.2%	3.3%	8.9%	8.9%	23.3%
Total		Count	3	10	65	12	90
		% of Total	3.3%	11.1%	72.2%	13.3%	100.0%

$t_{\text{count}} = 0.553, p = 0.582$

Table 5 shows that of 90 respondents most of the good environmental hygienitas and toddlers normal nutritional status (67.8%). Result of data analysis using t test got t count equal to 3,753 and $p = 0.000$, so $p < 0.05$. This reveal a significant influence between hygienitas environment with nutritional status of children. Some studies found the link between environmental hygiene and nutritional conditions.^{12,13} Health status can be

improved by maintaining health and physical and social environment. From an epidemiological point of view the nutritional problems are strongly influenced by the host, the agency, the environment. The imbalance between these three factors, such as the occurrence of nutrient insufficiency. Poor environmental sanitation will make children more susceptible to infectious diseases that may ultimately affect nutritional status.

Table 5. Cross-linking of environmental hygienity with nutritional status

			Nutritional status				Total
			Bad	Insufficient	Normal	Fat	
Hygienity level	Less	Count	3	0	0	0	3
		% of Total	3.3%	0.0%	0.0%	0.0%	3.3%
	Enough	Count	0	8	4	2	14
		% of Total	0.0%	8.9%	4.4%	2.2%	15.6%
	Good	Count	0	2	61	10	73
		% of Total	0.0%	2.2%	67.8%	11.1%	81.1%
Total		Count	3	10	65	12	90
		% of Total	3.3%	11.1%	72.2%	13.3%	100.0%

$t_{\text{count}} = 3.753, p = 0.000$

Table 6 shows that of 90 respondents most of the incidence of URI and diarrhea is absent and children under normal nutritional status (72.2%). Result of data analysis using t test got t count equal to -1,313 and $p = 0.193$, so $p > 0.05$. Thus, there is no significant influence between incidence of URI and diarrhea with nutritional status of children. Malnutrition due to dietary intake can be affected by childhood illness, such as URI and diarrhea.

This will be important enough to get serious attention in childhood because it can enter a variety of disorders of growth and development of nutritional status. Similarly, diarrhea can cause nutritional disorders due to reduced food intake.¹⁴ Less nutritional status leads to decreased body resistance and stronger viral pathogens, resulting in a balance of disorders and infection.

Table 6. Cross tabulation of incidence of URI and diarrhea with nutritional status

			Nutritional status				Total
			Bad	Insufficient	Normal	Fat	
URI and diarrhea	Exist	Count	1	2	0	5	8
		% of Total	1.1%	2.2%	0.0%	5.6%	8.9%
	No	Count	2	8	65	7	82
		% of Total	2.2%	8.9%	72.2%	7.8%	91.1%
Total		Count	3	10	65	12	90
		% of Total	3.3%	11.1%	72.2%	13.3%	100.0%

$t_{count} = -1.313, p = 0.193$

Lastly, the testing results of the effect of energy and protein consumption levels on nutritional status show that out of 90 respondents, most of the level of energy and protein consumption is normal and toddlers normal nutritional status (52.2%). The result of data analysis using t test got t count equal to 4,751 and $p = 0.000$, so $p < 0.05$, mean H_0 rejected and H_1 accepted so there is significant influence between nutrient intake with nutritional status of children aged 24-60 months. Nutrition is a substance or chemical element contained in the food needed for metabolism in the body normally. Nutrition needed by the body consists of carbohydrates, fats, proteins, vitamins, minerals and water. In an effort to achieve adequate consumption, the two most important factors that can affect the daily consumption of nutrients of availability of food and nutritional knowledge.¹⁵ A person will be able to provide adequate consumption when they are able to provide nutritional food.

Conclusion

The findings reveal that there is a significant influence between maternal education variables on nutritional status of children aged 24-60 months in 3 Puskesmas Kab. Gresik. The variables of knowledge, environmental hygienity and protein energy intake have a significant influence on nutritional status of children. Moreover, there is no significant influences of parenting, URI incident and diarrhea and family income variable on nutritional status of children. Of the factors above, the most dominant influence the nutritional status of children aged 24-60 months is the knowledge and protein energy intake. This encourages the community, especially the nanny, or the mother of the child 2-5 years to increase knowledge about child nutrition, and for healthcare workers to routinely hold program both in mother and children related to child nutrition.

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