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Factors Related to the Status of Vitamin A and Zink Baduta Aged 6-23 Months in the District of East Central South, Province of Nusa Tenggara Timur

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Abstract

The issue of macro nutrients in Indonesia and in developing countries particularly relate to the and Protein Energy Malnutrition (PEM), since several decades is slowly shifting into a double nutritional problems, starting from the problem of Nutritional Anemia Iron, Vitamin A deficiency (VAD), Disorders Iodine deficiency (GAKI). Less micronutrients (vitamin A and zinc) is one of the factors that influence the incidence of chronic malnutrition. LNS is designed to prevent malnutrition, linear growth of the baby and should facilitate the recovery of moderate acute malnutrition. Objective: This study aimed to determine the status of vitamin A and Zinc among baduta aged 6-23 months in the Middle East South East Nusa Tenggara is based on the characteristics of respondents; age of children, child gender, maternal occupation, job father, mother's education, educational father, Vitamin A and Zinc status. Methods: The population in this study is the family who lived in the WFP target areas and selected from research sites with cross sectional study design. Sample frame is families with children 6-23 months at selected locations with the research subjects were infants aged 6-23 months as many as 720 people. Results showed that of the 720 samples obtained in this study sample by gender characteristics mostly male (53.8%), age group baduta mostly at age 12-24 months (57.1%), Most of father job are farmers (69.3%), whereas mothers job are housewives (81.5%), education father mostly <9 years (60.3%), most of the mother's education <9 years (66.3), largely lacking zinc status (86.8%) and status Vitamin A mostly less (70.3%).

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Bivariate analysis using Chi Square test showed that gender, age group of baduta, work father, mother's occupation, education of father and mother's education were significantly associated with vitamin A status ($p < 0.05$) whereas the zinc status variables related jobs only father , maternal education and age groups baduta. The most pertinent factor of test results Multiple Regression Liner is the work of the father. In conclusions, factors related to vitamin A status is gender, baduta age, mother's education and father and mother and father job while factors relating to the status of a job only zinc father, mother and sex education. Based on Multiple Linear Regression Test determinant variables obtained for vitamin A and zinc status is the work of the father.

Keywords: Levels of Vitamin A, zinc, children aged 6-23 months

1. Introduction

Absorption of fat-soluble vitamins are normally determined by the normal absorption of fat. Fat absorption disorders caused by impaired bile system will cause absorption of vitamins are fat soluble. Once absorbed, the vitamin is taken to the liver in the form of chylomicrons and stored in the liver or in fat tissue. In the blood, fat-soluble vitamins are transported by lipoproteins or specific binding protein (Specific Binding Protein), and because it does not dissolve in water, then its excretion via bile, jointly with feces [1]. Nutritional status of low public still should be the focus of attention. In addition to the prevalence of malnutrition and malnutrition are high, another major nutritional problems, namely iron anemia, a disorder caused by lack of iodine, vitamin A deficiency, and lack of other micro-nutrients need to be increased more efforts need to be increased ITS prevention and curative [2].

Currently there are 10 provinces with prevalence of malnutrition above 30 percent, even in the 4 provinces of Gorontalo, NTB, NTT, and Papua, above 40 percent. Health Office of South Central Timor (2012) reported that the percentage of coverage of malnutrition in children under five in the district. TTS in 2011 as much as 0.43%, which is highest malnutrition coverage at the health center Hoibeti 30 cases, health centers and health centers Kuanfatu Nunkolo many as 20 cases and health centers and health centers Ayotupas Fatumnasi were 17 cases. In 2012, Indonesia Country malnutrition number 5 in the world, ranked fifth because of the population of Indonesia is also the world's number four. The number of malnourished children in Indonesia is around 900 thousand inhabitants. The amount represents 4.5 percent of the number of infants Indonesia, with 23 million inhabitants. Areas that malnutrition throughout Indonesia, not only the eastern region Indonesia [3].

0-24 months of age is a time of rapid growth and development, so often termed as the golden period at the same critical period [4]. Period of gold can be realized if at this time infants and children receive appropriate nutrition for optimal growth and development. Conversely, when infants and children at this age do not get food according to their nutritional needs, then the golden period will turn into a critical period that will disrupt the growth and development of infants and children, both at present and in future [1,5]. The successful development of a nation is closely related to the good quality of human resources. The establishment of optimal quality of human resources, both physically and psychologically healthy is very dependent on the growth process of children at the early age [6]. Development of children include physical, cognitive, emotional, language, motor (coarse and fine) [7,8]. Monitoring child development is useful for finding irregularities / barriers early child

development, so that prevention, stimulation efforts and the efforts of healing and recovery efforts can be provided with a clear indication as early as possible in the critical period of growth and children development [7].

Deficiency of vitamin A and zinc was the most dangerous for children, because they are susceptible to measles, diarrhea and malaria, 20-24% of deaths of children due to the disease-3, one of which is caused due to insufficient intake of vitamin A and Zink [9,10,11]. Deficiency of vitamin A is generally almost about 670,000 children under five in the world and zinc deficiency nearly 450,000 children and approximately one-third of children aged 5 years old in the world have inadequate intake of vitamin A and Zink [12].

Some of the consequences that occur in infants are low body weight, the high morbidity of mental development disorders, and increased risk of chronic diseases. Thus, required an innovative effort by improving the quality of breast milk as one of several cost-effective strategies to improve the nutritional status and children health [1, 13].

Increased age infants also increased nutritional needs. When a baby enters the age of 6 months upwards, then given in addition to breast milk began to be given complementary feeding (MP-ASI) in order for the nutritional needs of infants / children are met. In addition to breastfeeding and complementary feeding, provisions of Lipid Nutrient Supplements are very important. Lipid Nutrient Supplement (LNS) is one of the Ready to Use Food (RUF), in the form of oil-based paste, with a texture similar to butter / peanut butter. An energy-dense foods, enriched with minerals and vitamins that can be consumed directly from the package without cooking before [14, 15, 16], because it can be consumed directly and do not need to be cooked or diluted with water. LNS is designed to prevent malnutrition, linear growth of the baby and should facilitate the recovery of acute malnutrition [17].

By granting this LNS, it is expected to provide a basis for determining solutions and policies (evidence based policy) reduction programs prevalence of vitamin A deficiency and Zink especially on baduta aged 6-23 months in Timor Tengah Selatan NTT.

Based on this, through this research will be carried out research on the effectiveness of LNS to increased levels of Vitamin A and Zinc before and after administration of LNS intervention for 3 months compared with MP-ASI SUN and control. Given at age baduta 6-23 months which is expected to provide a basis for determining solutions and policies (evidence based policy) reduction programs prevalence of vitamin A deficiency and Zink especially on baduta age 6 -23 months in Timor Tengah Selatan NTT.

2. Materials and Methods

2.1 Location and Design Research

The study was conducted in the districts of Timor Tengah Selatan NTT. Selected 9 districts, ie., South Mollo districts, Batu Putih districts, Soe District, Kuatnana District, Amanuban West District, East Amanuban District, Kaunfatu District, Polen District, and Kualin District. The study design was a cross sectional study.

2.2 Population and Sample Research

The population in this study is the family who lived in the WFP target selected areas study sites. Sample frame is families with children 6-23 months at selected locations. Sample size equals the sample project WFP, for each group is 1200 baduta aged 6-23 months (total for the entire group is children baduta 3600) specifically for biomarkers inspection will only be conducted on a 20% sample chosen for each group. (240 baduta for each group so that a total of 720 baduta will be investigated biomarkers).

2.3 Types and Data Collection Method

Data vitamin A and zinc were collected by measurement of serum retinol levels of serum retinol levels in blood plasma were measured using High performance Liquid Chromatography (HPLC) and Zink serum levels in the blood were measured by Atomic Absorption Spectrophometry (AAS). Blood sampling performed twice, at the beginning and end of the study. Blood samples were taken veins subject. Socio-economic state of the family, the neighborhood, and the baby's medical history was collected through interviews with the mother / baby sitter. Interviews were conducted by trained field workers D3 Bachelor of Nutrition and Public Health using data collection forms. Intake and diet to see directly the size of the household nutrient intake and diet babies were measured using 24-hour recall and consumption (food frequency).

2.4 Processing and Data Analysis

Data processing is done using computer programs, namely SPSS version. 21.0 for Windows. Data vitamin A and zinc status is entered in the SPSS program together with other data the child's age, gender, occupation mother and father, the mother and father of a study period, the intake of protein and fat sounding chi square test and to refine the analysis has also been conducted logistic regression test.

3. Results

Socioeconomic Characteristics of Respondents

The data in Table 1 show that of 720 samples obtained in this study sample by gender characteristics mostly male (53.8%), age group baduta mostly at age 12-24 months (57.1%), father job mostly are farmers (69.3%), most mothers work are housewives (81.5%), education father mostly <9 years (60.3%), most of the mother's education <9 years (66.3), largely lacking zinc status (86.8%) and status Vitamin A mostly less (70.3%).

Followed by bivariate analysis using Chi Square test showed that gender, age group baduta, work father, mother's occupation, education of father and mother's education were significantly associated with vitamin A status ($p < 0.05$) whereas the zinc status variables related jobs only father , mother's education and age groups baduta.

The data in Table 2 shows of each variable related to the chi square test with vitamin A and zinc status, tested together with the multiple linear regression to determine the determinant variables with vitamin A and zinc

status variable father's job status of vitamin A (0.000) and for the status of zinc (0.019).

Table 1: Characteristics Socioeconomic baduta Age 6-23 Months in Timor Tengah Selatan Nusa Tenggara Timur

Variables	n	%	p-value vit. A	p-value of zink
Sex				
Male	387	53.80%		
Female	333	46.30%	0.022*	0.264
Age				
6-11 month	309	42.90%		
12-24 month	411	57.20%	0.023*	0.017*
Mother education duration				
< 9 years	477	66.30%		
≥ 9 years	243	33.80%	0.011*	0.037*
Father education duration				
< 9 years	434	60.30%		
≥ 9 years	286	40%	0.008*	0.953
Mother occupation				
Working	133	18.50%		
Household	587	81.50%	0.009*	0.115
Father occupation				
Not working	13	1.80%		
Farmer	499	69.30%		
Non farmer	208	28.90%	0.000*	0.018*

* Significantly associated with vitamin A status and Zink with p <0.005

Table 2: Regression Analysis Status of Vitamin A and Zinc baduta Age 6-23 Months in Timor Tengah Selatan Nusa Tenggara Timur

Variables	N	Sig. Vitamin A	Sig.Zink
Sex	720	0.047*	0.292
Baduta Age	720	0.041*	-
Father occupation	720	0.000*	0.019*
Mother occupation	720	0.165	-
Father education	720	0.19	-
Mother education	720	0.292	0.118

* Significantly associated with vitamin A status and Zink with p <0.005

4. Discussion

Socioeconomic Characteristics of Respondents

Deficiency of vitamin A and zinc was the most dangerous for children, because they are susceptible to measles, diarrhea and malaria, 20-24% of deaths of children due to the disease, one of which is caused due to insufficient intake of vitamin A and Zink. Deficiency of vitamin A is generally almost about 670,000 children under five in the world and zinc deficiency nearly 450,000 children and approximately one-third of children aged of five years old in the world have inadequate intake of vitamin A and zinc [17,18,19]. There are several factors related to vitamin A in this study: gender, age, education, father, mother's education, employment, the father and mother work while zinc is associated with gender, work father, and mother's education.

Gender related to vitamin A and zinc status because nutritional needs, especially vitamin A and zinc for baby boys and baby girls are different, because the boys have a larger body and greater muscle mass and activity baby boy more so in need of vitamin A which is larger than the female infants because if the body lacks vitamin A will decrease the child's immune system so vulnerable to infectious diseases such as measles, diarrhea and pulmonary tuberculosis [9, 12, 20]. Consumption of vitamin A is enough to increase the body's immune system, so that children avoid the disease, while zinc is needed for division, the growth and regeneration of cells and to increase immune [15,18,20,], according to the results of research that gender is male majority is 53.8% and there was a significant relationship between sex and vitamin A and zinc status in baduta.

Age of baduta in the age group 12-24 months related to vitamin A status due to the increasing age of the baby, the needs of micro and macro nutrients are also needed to increase growth and development [6, 21] needs, according to the results of research that most baduta age group is 12 -24 months is 57.1% and there was a significant relationship between age baduta with the status of vitamin A. Education and employment of women and men associated with vitamin A and zinc status because education has a very important role in improving the quality of life. Education also affects fully to improve the economy and made people more quickly understand and be ready to face changes [21,22].

The results showed that the father of most of the old education <9 years is 60.3%, the majority of maternal education <9 years is 66.3% and the chi-square test found a significant relationship between the father and mother's education with vitamin A and zinc status, While the job is something that is done mainly to support family life. Work is generally a time-consuming activity. Working mothers will affect family life, fathers and working mothers will affect family income including nutrient requirements or seimbang4 menu. The results showed that the majority of fathers work; 69.3% are farmers and mothers work mostly housewives 81.5% and chi square test showed that there is a significant relationship mother and father work with vitamin A and zinc status it is also visible from Regression Testing linear determinants that vitamin A and zinc status in infants aged 6-12 months is the work of the father ($p = 0.000$).

5. Conclusion

Factors related to vitamin A status is gender, baduta age, father and mother education and father and mother

occupation whereas factors relating to the status of a job only zinc father, mother and sex education. Based on Multiple Linear Regression Test determinant variables obtained for vitamin A and zinc status is the work of father.

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