

## Strategies for Improving Nutritional Status of Children under Five in Communities

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### ABSTRACT

Malnutrition may cause retarded growth of the body and, more importantly, a delay in brain development. Additionally, it may decrease or lower the body's resistance to infectious diseases. The issue of under-nutrition in children under five is caused by many direct and indirect factors. Therefore, there is a need for comprehensive management strategies to prevent high rates of malnutrition. Strategies to overcome the issue of malnutrition in children under five include revitalizing the function of the Integrated Health Service Post (locally known as 'Posyandu'), increasing community and family participation in monitoring the growth and development of children under five through Posyandu revitalization, improving the ability of personnel in the management of malnutrition to support the function of Posyandu.

**KEYWORD:** Todler, Nutritional Status Improvement

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### INTRODUCTION

Efforts of health improvements made since the child in the womb until the first five years of life are intended to maintain their survival and improve their quality of life in order to achieve optimal growth and development, physically, mentally, emotionally and socially, as well as having multiple intelligence in accordance with the genetic potential [1] Infants' high morbidity and mental development are direct or indirect results of disrupted growth [2]

According to WHO (2010), as many as 103 million children aged under five in developing countries were underweight. Approximately 30% of the world population, consisting of infants, children, adolescents, adults, and the elderly, suffer from malnutrition. Fifty per cent of mortality rates of children under five are associated with malnutrition (<http://www.gizi.net>). Children with insufficient quantity and quality of food would have abnormal growth. Furthermore, continued abnormal growth of children would be reflected in their height. According [3], a lack of any one nutrient may impair growth. A lack of energy, protein, vitamins and trace elements may reduce growth; on the contrary, an excess of various micronutrients may disrupt growth and development as well.

Nutritional problems are a public health issue that cannot be overcome merely with medical and health service approaches. In addition to being a poverty syndrome closely related to the problems of food security at the household level, it relates to the aspects of knowledge and behavior less supportive of healthy lifestyles. Nutritional status of a community would affect health and life expectancy, which are among the main elements in determining the successful development of a country, known as the Human Development Index [4] Nutritional problems in Indonesia are more prevalent in children under five years, despite the progress in overcoming the problem of malnutrition in Indonesia over the past 10 years. Nutritional status of a community can be assessed on the basis of the nutritional status of children under five. In Indonesia, 4 in 10 children under five have impaired physical growth and low intelligence level due to protein-energy malnutrition [5]

According [6], malnutrition affects children's future growth. In the childhood, they experience rapid growth and development that require adequate supply of food and nutrition. Malnutrition in childhood may have physically, mentally, socially and intellectually disrupted growth, which is permanent until the adulthood.

More specifically, malnutrition may cause retarded growth of the body and, more importantly, a delay in brain development. Additionally, it may decrease or lower the body's resistance to infectious diseases. The issue of under-nutrition in children under five is caused by many direct and indirect factors [7].

Among the direct factors of malnutrition are inappropriate feeding patterns, below the nutritional adequacy rate, resulting in lower energy and protein intake. In addition, the presence of infectious diseases may cause children under five to lose their appetite, resulting in a reduced intake of food and

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drink into their body. Infectious diseases are among the leading causes of infant mortality in Indonesia, which include pneumonia (23.6%), diarrhea (16.6%), severe infections (15.1%), malnutrition + severe underweight (3.6%). Infectious diseases are caused by the entry of microorganisms into the body, leading to an abnormal reaction of the body. It may cause reduced appetite or difficulty in swallowing and digesting food, thus decreasing food intake into the body, and eventually under-nutrition [8]

According to the statistics of the Ministry of National Development Planning/BAPPENAS, of 241,973,879 Indonesia's population, 18.4% suffer from under-nutrition. Nationally, 76,178 children under five suffer from malnutrition. According to [9], hunger and malnutrition cause the highest death rates in the world. At least 17,289 children die every day due to hunger and malnutrition.

According [10] the prevalence in children under five of under-nutrition and malnutrition based on weight-for-age (W/A) was 13.0% and 4.9%, respectively. In Kediri City, there were 522 underweight infants, or 3.7% of the population of children under five had under-nutritional problems. The number of underweight children under five in Kediri exceeded the normal threshold of less than 1% in an area.

Of those under-nutritional children, there were 28 suffered from pneumonia. It was caused by various factors, such as poor household food security, inadequate feeding patterns, other infections and poor parenting. On the other hand, there were 15 cases of diarrhea, 28 cases of pneumonia and 14 cases of tuberculosis. In addition, results of the preliminary study of 5 mothers using 24-h recall on feeding patterns, specifically asking the types of staple food they fed their children under five, showed that 3 respondents fed their babies  $\frac{1}{2}$  dish of rice twice a day plus *tempeh* mixed with soy sauce and sometimes tofu. The rest of the mothers fed their baby as needed. The five respondents fed their baby vegetables, such as spinach. Two respondents claimed usually feeding their baby banana and papaya, but it was not regularly, one respondent claimed rarely feeding their baby fruits, and 2 respondents usually fed their baby fruits as needed.

The above description provided information that the nutritional status of children could be detected on the basis of irregular feeding patterns, which was not in accordance with the nutritional needs of the baby, inadequate family food security and rarely monitoring of the child's growth and development to the Posyandu. These behaviors had negative effects on the nutritional status of children under five.

Nutritional problems are effected by a complex interplay of various factors. At the household level, nutritional status is effected by the family's ability to provide food in adequate quantity and types. Parenting is effected by educational and behavioral factors and the family's health status [11]

According to [3], nutritional status of children under five would be worse when the mother has poor knowledge of menu composition, provision of complementary foods and distribution of food in the family. In a large, low-income family, children may suffer since the family's incomes used for many family members. A community's adequate knowledge of nutritious foods for children under five would increase the nutritional status of children under five, and vice versa. Family structure may have an effect on morbidity (such as infectious diseases and malnutrition) and health service utilization.

According to [12] nurturing includes taking care of, paying attention to and guiding child towards adulthood. Lack of attention to growth and development of children under five would lead to a lower nutritional status. Serious management of nutritional status of children under five should not only be carried out by the government, but also the caregivers who are closest to the children under five. Proper provision of nutritious foods and appropriate nurturing during the developmental stage may produce a healthy, intelligent and productive next generation.

## METHODS

The present study was a quantitative research. Based on the research framework and the structural models developed to answer the research questions, there were six dimensions or latent variables making up the construct of nutritional status improvement model. The direct factors of the model included food intake, infectious diseases and the indirect factors included food availability, knowledge, parenting and socio-economic status. In addition, nutritional status was another latent variable.

The population of the study was people or households with children under five. Quantitative data were collected by selecting samples using the proportional random sampling method. Inferential statistics analysis was focused on the field of study analysis and interpretation of data to draw conclusions. It was used to test the developed research hypotheses by using the sample data. The inferential statistical method used for data analysis was the structural equation modeling (SEM).

## RESULTS

The City of Kediri, covering the area of 63.40 km<sup>2</sup>, consists of 3 sub-districts: Mojoroto, City and Pesantren. Mojoroto Sub-district covers the largest area (24.6 km<sup>2</sup>) and City Sub-district the smallest (14.9 km<sup>2</sup>). The 2012 population data showed that Kediri City had as many as 312,331 residents, increasing compared to that of 2011 with 302,671 residents. Of the former figure, 157,043 were men and 155,288 women.

Based on respondents' characteristics, a half of the children under five (55.5%) were male, and the rest were female (44.50%). Most of the mothers of children under five (64.0%) were graduates of high school and only a fraction of them were graduates of primary school (3.0%). Almost a half of the mothers (37.5%) were housewives and a fraction of them were private employees. Nearly half of the parents of children under five (40.00%) had an income of between IDR 500,000 to IDR 1,000,000 and a small fraction of them had an income of more than IDR 1,000,000. A half of children under five (50%) were the first child and a small portion of them were the third child.

With regard to respondents' characteristics of knowledge of nutritious foods for children under five, functions and kinds of nutrients, sources of nutritious foods, provision of nutrients to children under five and evaluation of nutrient utilization in children under five, the mothers had good knowledge of nutritious food functions and the types of nutrients the children required. However, they lacked understanding of the fulfillment of specific nutrient needs of their children under five.

With regard to the respondents' characteristics of socio-economic status, all family members worshipped according to the religion with the head of the family or a family member being active in community associations and showing lowest score on access to information and means of transport. With regard to respondents' characteristics of parenting, which included feeding, health care and self-care, the highest score was on feeding the newborn and the lowest one was on feeding method.

With regard to respondents' characteristics of family food security, which covered adequacy, quantity, quality, safety, nutritional value, diversity, equality, and affordability of staple foods, the highest score was on the availability of staple foods and the lowest one was on the affordability of staple foods. With regard to respondents' characteristics of assessment of the quality of health services in Kediri, which included the parameters of reliability, responsiveness, assurance, empathy and tangibles, the highest score was on patients receiving procedures quickly and accurately and the lowest score was on the knowledge and capability of physicians in establishing the diagnosis.

With regard to respondents' characteristics of the incidence of infections, which included pneumonia, persistent diarrhea, intestinal worms, tuberculosis, malaria, HIV/AIDS and other infectious diseases, a small proportion of respondents (32.5%) had a history of suffering from pneumonia, followed by persistent diarrhea (2.5%).

With regard to respondents' characteristics of feeding patterns, which included nutritious foods, breastfeeding and benefits of nutrient fulfillment, the question most often answered correctly (94.5%) was that of number one, asking about nutritious food and number 13 about the benefits of nutrient fulfillment for children under five. The least correctly answered question (80.0%) was that of number 9 about the benefits of breast milk.

With regard of the distribution of nutritional status of children under five in Kediri City, the majority of respondents (42%) had children with under-nutrition status and a small portion of them had children with malnutrition status (0.5%).

### FACTORS AFFECTING IMPROVEMENT OF NUTRITIONAL STATUS OF CHILDREN UNDER FIVE

There are three assumptions in the SEM model that must be met: linearity, outlier and normality of distribution. The assumption of linearity can be tested by creating a scatter diagram or using the curve fit approach (in SPSS). Linearity assumption can be tested by the curve fit method performed in SPSS. When the significance value of the linear model is  $< 0.05$ , then the assumption of linearity is met.

**TABLE1**  
**Tests of Linearity Assumptions**

Correlation	Test Results	Remark
Knowledge → Nutritional status	dev. from linearity 0.206 > 0.05	Linear
Socio-economic status → Nutritional status	dev. from linearity 0.774 > 0.05	Linear
Parenting → Nutritional status	dev. from linearity 0.548 > 0.05	Linear
Food security → Nutritional status	dev. from linearity 0.107 > 0.05	Linear
Health service → Nutritional status	dev. from linearity 0.460 > 0.05	Linear
Feeding patterns → Nutritional status	dev. from linearity 0.769 > 0.05	Linear

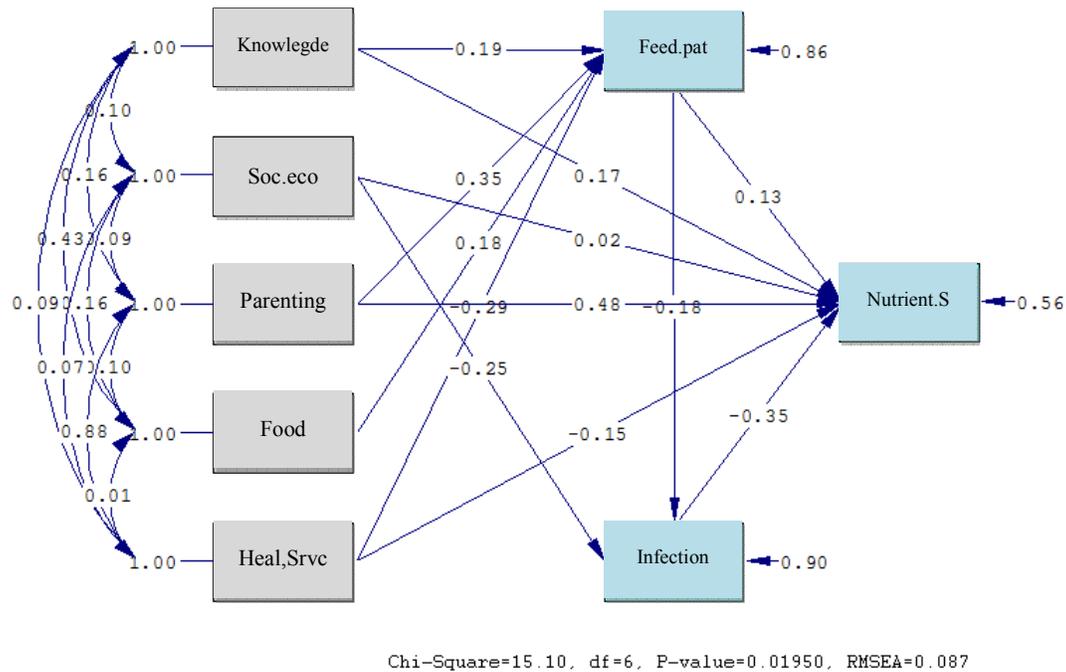
Table 6.1 shows six correlations among variables. All the linear models were significant since the significance value of deviation from linearity of the liner model was greater than 0.05; thus, the assumption of linearity is met. Since all the variables in the study were, the model could be analyzed by the goodness-of-fit test in Lisrel. The values of the goodness-of-fit test are calculated using the Chi-square statistics, where the model is considered fit or satisfactory when the value of chi-square is low. The smaller the  $\chi^2$  value, the better the model will be and accepted based on the probability at the cut-off value of  $p > 0.05$  or  $p > 0.10$ .

**TABLE 2**  
**Goodness-of-Fit Tests of the Model**

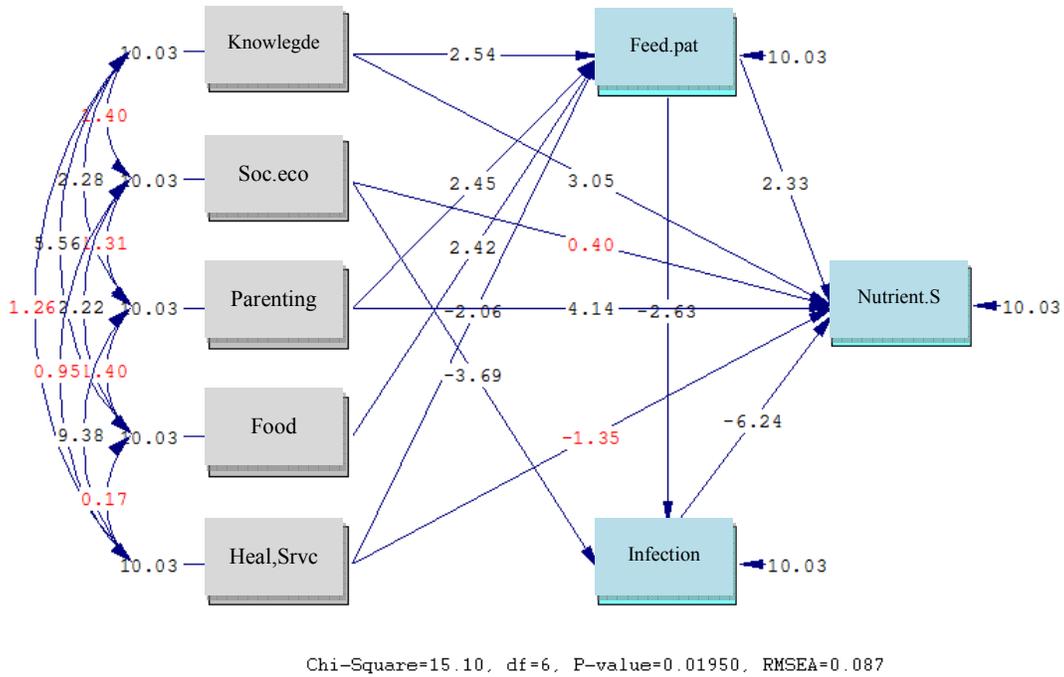
Correlation	Test Results	Remark
Knowledge → Nutritional status	Significant, $p = 0.123 > 0.05$	Model fit
Socio-economic status → Nutritional status	Significant, $p = 0.470 > 0.05$	Model fit
Parenting → Nutritional status	Significant, $p = 0.380 > 0.05$	Model fit
Food security → Nutritional status	Significant, $p = 0.313 > 0.05$	Model fit
Health service → Nutritional status	Significant, $p = 0.704 > 0.05$	Model fit
Feeding patterns → Nutritional status	Significant, $p = 0.788 > 0.05$	Model fit
Feeding patterns → Nutritional status	Significant, $p = 0.272 > 0.05$	Model fit

Results of the calculation of  $\chi^2$ -chi-square showed that all the significance values were higher than the cut-off value of 0.05; thus, the model is considered as having the relevant predictive value.

The estimated  $t$ -value in red illustrated that the resulting  $t$ -values were lower than  $t^{\text{table}}$  (1.96) at the significance level of 5%, or the variable was not significant. The significance of variables are shown as follows:



**FIGURE 1.**  
Conceptual Model of T-values



**FIGURE 2.**  
Conceptual Model of T-values

Tests of the direct effects of knowledge on nutritional status showed an inner weight coefficient of 0.17 with a *t*-value of 3.05. Since the *t*-value was > 1.96, then there was a significant direct effect of knowledge on nutritional status. Nutritional problems often arise out of respondents’ ignorance and lack of information about nutrition. New behaviors are formed from knowledge of stimulation of materials or objects that will generate new knowledge on the subject and then lead to further response in the form of action. However, sufficient knowledge does not guarantee a person to behave the same as what they know, leading to the small inner weight coefficients.

Tests of the direct effects of socio-economic status on nutritional status showed an inner weight coefficient of 0.02 with a *t*-value of 0.40. Since the *t*-value was <1.96, then there was no significant direct effect of socio-economic status on nutritional status. Socio-economic conditions of a family did not have direct effects on nutritional status of children under five. However, for extreme cases, such as a very poor family and very low ability to meet nutritional needs, socio-economic conditions may have effects on nutritional status of children under five.

Socio-economic conditions of a family greatly affect whether or not a child’s primary and secondary needs, as well as the attention and affection will be fulfilled. It is, of course, closely related to the family income, the number of siblings and parental education. People with low economic status will spend more of its income for foods. And, when their income increases, normally they will spend most of their income to increase foods. Thus, income is a factor that most determines the quantity and quality of food.

Tests of direct effects of parenting on nutritional status showed an inner weight coefficient of 0.48 with a *t*-value of 4.14. Since the *t*-value was > 1.96, then there was a significant direct effect of parenting on nutritional status. Tests of effects of knowledge on nutritional status are presented in the following figure:

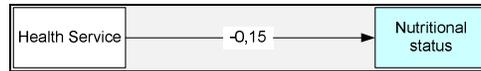


**FIGURE 3**  
Tests of parenting effects on nutritional status

During the period of parenting, the first environment of a child is his or her parents. A child grows and develops under the care of parents; thus, parents are the very basis for the formation of the child’s

personality. Through their parents, children adapt to their environment to get to know the surrounding world as well as the prevailing patterns of social life. Thus, the basis for the development of an individual has been placed by their parents through parenting practices. All parents should give their children the right to grow. All children should obtain the best to grow in line with what they may achieve and in accordance with their abilities. Therefore, they need parental attention/ support. In order for a child to grow well, merely feeding them is not enough, moreover, carelessly selecting menus or merely feeding the child with rice. But, children need parental attitude in feeding.

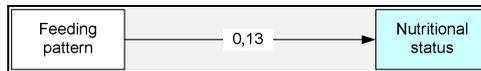
Tests of direct effects of health services on nutritional status showed an inner weight coefficient of  $-0.15$  with a  $t$ -value of  $-1.35$ . Since the  $t$ -value was  $< 1.96$ , then there was no significant direct effect of health services on nutritional status. Tests of the effects of health services on nutritional status are shown in the following figure:



**FIGURE 4**  
Tests of health service effects on nutritional status

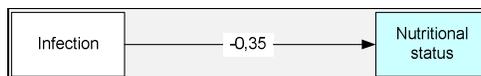
Direct effects of feeding patterns on nutritional status showed an inner weight coefficient of  $-0.13$  with at  $t$ -value of  $-2.33$ . Since the  $t$ -value was  $< 1.96$ , then there was a significant direct effect of feeding patterns on nutritional status.

Implementation of health services in terms of nutrition consisted of preventive, promotive and curative programs. Nutrition volunteers played role in the implementation of promotive program by directly counseling the community through a variety of events created by the community themselves. The preventive program was carried out by Integrated Health Service volunteers through monitoring the nutritional status by weighing and measuring the weight and height of children under five. Thus, a decline in nutritional status could be tackled. Tests of effects of feeding patterns on nutritional status are shown in the following figure:



**FIGURE 5**  
Tests of feeding pattern effects on nutritional status

Tests of direct effects of infectious diseases on nutritional status showed an inner weight coefficient of  $-0.35$  with a  $t$ -value of  $-6.24$ . Since the  $t$ -value was  $> 1.96$ , then there was a significant direct effect of infectious diseases on nutritional status. Those tests indicated that infectious diseases had a dominant effect on nutritional status. Tests of direct effects of infectious diseases on nutritional status are shown in the following figure:



**FIGURE 6**  
Tests of infectious disease effects on nutritional status

Tests of direct effects of infectious diseases on nutritional status showed an inner weight coefficient of  $-0.35$  with a  $t$ -value of  $-6.24$ . Since the  $t$ -value was  $> 1.96$ , then there was a significant direct effect of infectious diseases on nutritional status. A negative value of the inner weight indicated a negative relationship between the two. It means that the lower the infectious disease, the better the nutritional status would be.

Nutrients obtained from food intake have strong effects on the immune response and resistance to infection. This was evidenced by the results of recent research showing that the provision of nutrition and anabolic hormones may regulate resistance of the host to bacterial infections. Malnutrition is a complicated and interrelated problem. Direct and indirect causes of under-nutrition in children under five play their roles, which are varied and different in each area. Infectious diseases and lack of nutritional

intake are interrelated. Malnourished children will have a decreased immune system, being susceptible to infectious diseases.

Effects of exogenous variables on the endogenous variables can be determined on the basis of the direct, indirect and total effects. Results of analysis showed that food security had the smallest direct effect on nutritional status, while parenting had the greatest direct effect on nutritional status. Food security had the smallest indirect effect and socio-economic status had the greatest direct effect on nutritional status.

Tests of the total effect of knowledge, parenting, food security and health services mediated by feeding patterns on nutritional status showed an inner weight coefficient of 0.13. Since the direct effects of knowledge, parenting, food security and health services on feeding patterns were significant, the indirect effects of knowledge, parenting, food security and health services mediated by feeding patterns on nutritional status was significant.

Tests of indirect effect of knowledge as mediated by feeding patterns on nutritional status showed an inner weight coefficient of 2.33. Since the direct effects of knowledge on nutritional status and feeding patterns on nutritional status were both significant, then the indirect effect of knowledge as mediated by feeding patterns on nutritional status was significant. Thus, the higher the knowledge, the better the feeding patterns and indirectly the better the nutritional status would be.

Tests of indirect effect of socio-economic status as mediated by infectious diseases on nutritional status showed an inner weight coefficient of -0.35. Since the direct effects of socio-economic status on nutritional status and infectious diseases on nutritional status were both significant, then the indirect effect of socio-economic status as mediated by of infectious diseases on nutritional status was significant. Thus, the higher the socio-economic status, the lower the infectious diseases and indirectly the better the nutritional status would be.

Tests of indirect effect of parenting as mediated by feeding patterns on nutrition showed an inner weight coefficient of 2.33. Since the direct effects of parenting on nutritional status and feeding patterns on nutritional status were both significant, then the indirect effect of parenting as mediated by feeding patterns on nutritional status was significant.

Tests of indirect effects of food security as mediated by feeding patterns nutritional status showed an inner weight coefficient of -0.26. Since the direct effects of food security on nutritional status and feeding patterns on nutritional status were both significant, then the indirect effect of food security as mediated by feeding patterns on nutritional status was significant. Thus, the better the food security, the better the feeding patterns and indirectly the better the nutritional status would be.

Tests of indirect effect of health services as mediated by feeding patterns on nutritional status showed an inner weight coefficient of 2.33. Since the direct effects of health service on nutritional status was not significant and feeding patterns on nutritional status was significant, then the indirect effect of health services as mediated by feeding patterns on nutritional status was not significant. Under-nutrition is a manifestation of a shortage of food or nutrient consumption, which has broad impacts and is measured by nutritional status. Nutritional problem is closely related to the food problem. The problem of food relates to food availability or food insecurity, which are currently the issues of food security.

Data processing generated the following structural equation:

$$\begin{aligned} \text{FEEDPATR} &= 0.140*\text{KNOWLEDG} + 0.200*\text{PARENTNG} + 0.0891*\text{FOOD} - 0.139*\text{HSERVICE}, \\ &\text{Errorvar.} = 1.723, R^2 = 0.143 \\ \text{INFECT} &= -0.0591*\text{FEEDPATR} - 0.0729*\text{SOCECO}, \text{Errorvar.} = 0.204, R^2 = 0.0976 \\ \text{NUTRSTAT} &= 0.0709*\text{FEEDPATR} - 0.551*\text{INFECT} + 0.0689*\text{KNOWLEDG} + 0.0104*\text{SOCECO} + \\ &0.147*\text{PARENTNG} - 0.0394*\text{HSERVICE}, \text{Errorvar.} = 0.319 \end{aligned}$$

The significance of the structural equation is shown in Table 5.10, which also contains the *t*-values and the coefficients of the structural model. It is shown that there are several insignificant equations, leading to small coefficient of determination (R<sup>2</sup>) of the structural equation. It means that variation in exogenous variables in the equation were less capable of explaining the changes in variation in endogenous variables. Thus, further processing was required to obtain the best model. Data of those causal relationships showed that feeding patterns had the strongest effect. The growing children under five are very active, requiring relatively more nutrients of higher quality. The adulthood outcome of the growth phase greatly depends on the nutritional conditions and health during infancy. Brain development that determines the intelligence level in the adulthood is largely determined by the growth during childhood. Malnutrition in the growth phase will produce an adult human with inferior traits. Thus, children under five should be provided with a major portion of the family food distribution, rather than

receiving the food left. Food consumption has an effect on nutritional status of an individual. A high nutritional status can be achieved when the body is supplied with sufficient nutrients for efficient use, allowing physical growth, brain development and ability to work to achieve optimal health.

### **STRATEGIES FOR IMPROVING NUTRITIONAL STATUS OF CHILDREN UNDER FIVE IN COMMUNITIES**

Nutritional problems are divided into macro- and micro-nutritional problem. Macro-nutritional problems are mainly caused by a shortage or an imbalance of energy and protein intake. Manifestations of macro-nutritional problems in children under five are marasmus, kwashiorkor or marasmic-kwashiorkor and further disruption of growth and development of children. Improvement of the macro-nutritional problems is aimed at reducing the macro-nutritional problems. It is mainly carried out by addressing the problem of lack of protein energy, especially in poor rural and urban areas; improving the family nutrition status; increasing community participation; improving the quality of nutrition-related services both in Puskesmas (community health center) and Posyandu; and increase consumption of energy and protein of malnourished children under five. Strategies to overcome the macro-nutritional problems are implemented by empowerment families in terms of health and nutrition, community development in nutrition, empowerment of health personnel and direct subsidies.

Results of the present study showed that malnutrition was affected by various interrelated factors. However, it was directly affected by three factors: children not receiving sufficient nutritious food, children not receiving adequate nutrition care and children possibly suffering from infectious diseases.

The first cause of malnutrition was that babies and children did not receive balanced and nutritious foods. The best natural food for babies is breast milk, and after 6 months of age they should be given complementary foods in the appropriate amount and quality. Good complementary foods not only contain enough energy and protein, but also iron, vitamin A, folic acid, vitamin B and other vitamins and minerals. Appropriate and good complementary foods can be prepared at home. In families with low levels of education and knowledge, a child has to be satisfied with simple foods not meeting their nutritional needs due to ignorance.

The second cause of malnutrition as that children do not receive adequate nutrition care. Results of the present study showed that parenting had an effect on the incidence of malnutrition. Children who are cared for with affection by their own mothers, especially those mothers who are educated, understand the importance of breastfeeding, the benefits of Posyandu and cleanliness, despite the poverty, are healthier. The factor of maternal education had an effect on the quality of child care. On the contrary, some malnourished children were turned out to be cared for by their grandparents or caregivers who were poor and uneducated.

The third cause of malnutrition was that children suffered from infectious diseases. There was a mutual relationship between the incidence of infectious diseases and malnutrition. Malnourished children would have a decreased immunity, leading to vulnerability to infectious diseases. On the other hand, children suffering from infectious diseases would tend to suffer from malnutrition.

In order to overcome nutritional problems based on the findings of the present study, strategies should developed for improving nutritional status of children under five in the form of an action plan for the family, community and the government. Measures to be taken include revitalizing the functions of Posyandu; increasing community and family participation in monitoring the growth and development of children; early recognizing and overcoming infants with impaired growth through Posyandu revitalization; improving the ability of personnel in the management of malnutrition to support the function of Posyandu managed by the community through revitalization of Puskesmas; directly tackling nutritional problems in vulnerable groups through nutritional intervention (supplementation), such as capsules of Vitamin A, complementary foods and supplementary foods; realizing nutrition-conscious families through nutrition promotion, advocacy and dissemination of healthy and nutritionally balanced foods and clean and healthy living; building cross-sectoral cooperation and partnerships with the private sector/business and the community for resource mobilization in order to increase the purchasing power of families to provide healthy and nutritionally balanced foods; and reactivating the Alert System for Food and Nutrition (ASFN) through revitalization of the ASFN and Malnutrition Early Alert System (MEAS), evaluated by assessment of the Early Alert System data.

### **CONCLUSIONS**

1. Factors affecting nutritional status of children consisted of factors with direct effects, consisting of feeding patterns and nutritional status, and factors with indirect effect, including knowledge, socio-

- economic status, parenting, food security and health service. The factor with the greatest effect was feeding patterns.
2. Strategies to overcome nutritional problems of children under five include:
- 1) Revitalizing the functions of Posyandu; increasing community and family participation in monitoring the growth and development of children; early recognizing and overcoming infants with impaired growth through Posyandu revitalization.
  - 2) Improving the ability of personnel in the management of malnutrition to support the function of Posyandu managed by the community through revitalization of Puskemas;
  - 3) Directly tackling nutritional problems in vulnerable groups through nutritional intervention (supplementation), such as capsules of Vitamin A, complementary foods and supplementary foods;
  - 4) Realizing nutrition-conscious families through nutrition promotion, advocacy and dissemination of healthy and nutritionally balanced foods and clean and healthy living;
  - 5) Building cross-sectoral cooperation and partnerships with the private sector/business and the community for resource mobilization in order to increase the purchasing power of families to provide healthy and nutritionally balanced foods;
  - 6) Reactivating the Alert System for Food and Nutrition (ASFN) through revitalization of the ASFN and Malnutrition Early Alert System (MEAS), evaluated by assessment of the Early Alert System data

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