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FOOD CONSUMPTION AND NUTRITIONAL STATUS OF UNDERFIVE CHILDREN ON FISHERMEN'S FAMILY DURING MONETARY CRISIS PERIOD JUNE 1998-AUGUST 1999 SEMARANG MUNICIPALITY

Laksmi Widajanti[1,2)] and Martha Irene Kartasurya[1,2]*
[1] Public Health Nutrition Department, Faculty of Public Health, Diponegoro University, Semarang 50275, Indonesia
[2] Center Health Research, Research Institute, Diponegoro University, Semarang 50275, Indonesia

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ABSTRACT

Since late 1997 Indonesia has been overwhelmed by monetary crisis and low income communities including fishermen received the worst impact of it. This study was intended to see whether there was a difference in food consumption and the nutritional status of the underfive years old children in the fishermen community before and during the crisis.

Sixty three subjects were chosen by cluster random sampling method and were followed from June 1998 to August 1999. Food consumption data were gathered by weighing method for two days and food frequency questionnaires. Paired t-test was used in the analysis.

The study revealed that the families income almost doubled, the food consumption was significantly increased in term of energy and protein. It was found that children have more frequent meal per day and more varieties of food eaten daily. The children's weight and height increased in an average of 2.5 kg and 8.7 cm, respectively. The nutritional status in aggregate data showed an increase in height per age but slightly decrease in weight per age and weight per height indices but not statistically significant. By group analysis, more children had lower nutritional status in all indices.

It is concluded that there were improvement in food consumption of the underfive years old children, as the children grow older. However, their nutritional status became lower. The primary health care providers in the area should be informed on this situation. It is important that they should direct nutritional education program to improve the nutritional status of the children in its working area.

Key words: Food consumption, nutritional status, underfive years old children, Fishermen family, monetary crisis

***) Correspondence**: Phone: +62-24-7471604; Fax: +62-24-7460044; E-mail : laksmiwid@yahoo.com

INTRODUCTION

Beginning at the end of 1997 Indonesia experienced a monetary crisis that caused lower purchasing power of families. The worst group affected this crisis are the low-income groups living either in rural or urban areas. This condition lead to low level of food availability in the family which directly will bring decline in the nutritional status of underfive years old children (Irawan and Romdiati, 2000).

In general, coastal community especially fishermen in Indonesia have already lived in a low level of income. Between June 1998 and August 1999, while Indonesia still faced with the monetary crisis, in about three months, fishermen could not go fishing due to the tide season or West Monsoon. This, during that time they did not have any income for food and health expenditure. As the consequence of this condition their underfive years old children as the most vulnerable group received the worst effect.

Earlier study indicated that most of the underfive years old children in the study area consumed fishes in heir daily meals and had good nutritional status (Kartasurya, 1999). This condition brought up an interesting question whether they still have the same food pattern and nutritional status ?

MATERIALS AND METHODS

Study area and sampling

This study was directed to find any difference of food consumption and nutritional status of underfive years old children between two periods of study. The first study was held in June 1998 and the second was held in August 1999, that was about the second and the third of monetary crisis in Indonesia. Fishermen families in Bandarharjo and Tanjungmas Villages were the subjects of the study. Most of the fishermen in Semarang were living in those villages. Sixty-three (63) subjects were chosen by cluster random sampling method at the village level.

Data collection

Data collected were : 1) Family income, gathered by structured questionnaires. 2) Food consumption of underfive years old children. 3) Nutritional status of underfive years old children were assessed by Weight fo Age (W/A) and Height for Age (H/A) indices (Gibson, 1990).

Two days weighing food method and food frequency questionnaires, and Food Processor II Program were used in food consumption analysis. WHO-NCHS Z-score standard (WHO, 1983) was used to assess the nutritional status of the children.

Data analysis

Data analysis was done by descriptive and analytic statistics. Paired t-tests were used to compare the data rfrom this study with the one before.

RESULTS AND DISCUSSION

Results

In August 1999, monthly of the income per caput ranged between Rp 43.000,00 and Rp 375.000,00. **Table 1** shows the difference between the income in June 1998 and August 1999. There was an increased in the income, in mean of Rp 71.221,00 or 85.8 %. Those income did not include the value of fresh fishes, which were brought home for family meals.

Table 1. Mean Income Difference (Rupiahs per months) Between two period of study (n = 63 fishermen's families)

Period of study	Mean	SD	Minimum	Maximum
June 1998	82.860,00	39.680,00	26.400,00	200.000,00
August 1999	154.210,00	71.500,00	43.000,00	375.000,00

There were 37 boys (58.7%) and 26 girls (41.3%) in this study. Compared to June 1998 data, in August 1999 the mean weight and height of the children increase an mean of 2.5 kg and 8.7 cm respectively.

In breastfeeding status, 22 children (34.9%) were breastfed in June 1998, but only 11 children (17.5%) were still breastfed in August 1999. Some of them were not breastfed anymore because they were older than two years old and the others (9 children) breastfeeding were changed to formula feeding. There was an increase number of children who were given formula milk from 3 (4.8%) to 10 children (15.9%).There was no change in frequency of eating main meal per day (**Table 2**).

Table 2. Difference in Main Meal Eating Frequency per day of Underfive years old children between two period of study

Frequency of Meals/day	June 1998		August 1999	
	Frequency (n)	Percentages (%)	Frequency (n)	Percentages (%)
Once	1	1.6	3	4.8
Twice	10	15.9	8	12.7
Thrice	50	79.3	51	81.0
Four Times	2	3.2	1	1.6
Total	63	100.0	63	100.0

In term of food varieties, the number of food group they consumed from 4 to 5 group of food per day. The groups of food here were staple food, plant protein, animal protein, vegetables, fruit, and milk. However, some children ate less number of food group than before. There were three children who only eat two groups of food per day, whereas in June 1998 none (**Table 3**).

Table 3. Difference in Numbers of Food Group Eaten by the Children per day between two period of study

Number of Food Group	June 1998 Frequency (n)	June 1998 Percentages (%)	August 1999 Frequency (n)	August 1999 Percentages (%)
2	-	-	3	4.8
3	21	33.3	3	4.8
4	37	58.7	15	23.8
5	5	7.9	35	55.6
6	-	-	7	11.1
Total	63	100.0	63	100.0

On the other hand, calcium consumption was lower in 1999 compared to 1998. **Table 4** shows the consumption difference in energy, protein, iron and calcium between 1998 and 1999 intake both in the real value and in percentages of Recommended Dietary Allowances (RDA).

Table 4. Underfive Years Old Children Consumption in Energy, Protein, Iron, and Calcium between two period of study

Energy/ Nutrient	Total consumption per day				Percentage of RDA			
	June 1998	Augus t 1999	t-value	p-value	June 1998	Augus t 1999	t-value	p-value
Energy (Kcal)	904.7	1156.9	3.71	0.001**	71.7	87.3	-2.87	0.007**
Protein (grams)	30.5	38.5	2.43	0.020*	131.4	159.1	-2.37	0.023*
Iron (mg)	9.3	9.9	0.27	0.786	108.8	141.2	-1.03	0.311
Calcium (mg)	298.3	192.4	-3.01	0.004**	59.7	47.4	-1.50	0.141

* $p<0.05$ significant
** $p<0.01$ highly significant

Energy and protein consumption between June 1998 and August 1999 data shows significant difference with p-values of 0.001 ($p<0.001$) an 0.004 ($p<0.001$) respectively. These increased consumption is quite understanable since the children were growing, thus they needed more energy and nutrients as they grew older. Interestingly, calcium consumption per day showed significant decrease with p-value of 0.0004, but by RDA percentage did not.

The nutritional status of the children were analyzed by z-score in three indices which are weight per age (WAZ), height per age (HAZ), and weight per height (WHZ). In average the children had lower z-score value for WAZ and in WHZ.

In the average their HAZ increased. The difference in nutritional status between June 1998 and August 1999 were not significant (**Table 5**).

Table 5. The Mean Difference of Nutritional Status and Median Percentages Values between two period of study (n= 63 children)

	June 1998			August 1999			t-values and p-values		
	WAZ	HAZ	WHZ	WAZ	HAZ	WHZ	WAZ	HAZ	WHZ
Z-score	-1.47	-1.48	-0.87	-1.61	-1.39	-1.00	-1.22 (0.228)	0.54 (0.592)	-1.31 (0.194)
Median Percentages	80.73	94.08	90.60	82.28	94.07	91.63	1.11 (0.271)	-0.01 (0.988)	1.03 (0.306)

$p > 0.05$ all t-values were not significant
( ) p values

Analyzing more detail on the nutritional status of each child, it was found that more children had lower z-score by each of indices. In HAZ index, although there was an increase in mean z-score, there were more children who had lower z-score in August 1999 compared to June 1998. The children who had higher HAZ have higher increase than those who had lower scores.

The change in categories of WAZ, HAZ and WHZ between June 1998 and August 1999 shows that the prevalence of normal and borderline nutritional status based on WAZ index decreased while the prevalence of undernutrition decreased. The proportion of normal category for HAZ increased but the proportion of stunted also increased (**Table 6**). Therefore the spread between the lowest and the highest HAZ become larger after longer period time in the crisis.

From June 1998 to August 1999, the number of children who had normal WHZ decreased and the number of children who had low WHZ increased. This indicates that children who have normal WHZ decrease and low WHZ increase.These decrease is not seen from the mean values presented in **Table 5**.

Table 6. The Delta of Nutritional Status and Median Percentages Values between two period of study (n= 63 children)

	June 1998			August 1999			Delta		
	WAZ	HAZ	WHZ	WAZ	HAZ	WHZ	WAZ	HAZ	WHZ
Z-score	-1.47	-1.48	-0.87	-1.61	-1.39	-1.00	-0.14 (-8.70 %)	0.09 (6.47%)	-0.13 (-13.0%)
Median Percentages	80.73	94.08	90.60	82.28	94.07	91.63	1.55 (1.88%)	-0.01 (-0.01%)	1.03 (1.12%)

( ) percentages

Discussion

During monetary crisis period June 1998-August 1999 there was an increase in mean income and both were above poverty line using Sayogyo criteria (cut off point Rp 66.666,66). One of many factors make this increase is because their wifes aid them to cover the household expenditure by working as unskilled fishermen women, blue collar worker, or dealer. However, there were families who had income below the poverty line.

In term of energy and protein consumption there was also an increase, but a decrease in calcium and iron consumption. This increase can be explained from **Table 3** and **Table 4** that their major pattern of food consumption became complete (5 groups) than before (4 groups).

Consumption of iron in both years still were above RDA; this can be explained from their animal protein consumption especially from fish which is high in iron.

There was slight decrease in mean nutritional status of the children in both years. In the last month of the study in 1999, 44.4 % underfive years old children were sick. Assuming that the children have same environment in both years, so slightly decrease on their mean nutritional status because of the environment induced infection.

CONCLUSION

There were an increase in the number of groups of food eaten by the children from 4 groups per day in June 1998 to 5 groups per day in August 1999. Total consumption and percentage of RDA in energy, protein, and iron increased but total consumption and percentage of RDA in calcium decreased between both years.

There was no decreased on mean nutritional status of underfive year children between June 1998 and August 1999. So there was no impact of monetary crisis on food pattern and nutritional status of underfive children on fishermen's family.

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REFERENCES

Gibson, R. S. *Principles of Nutrition Assessment*. 1990. Oxford University Press. Oxford.

Irawan, P. B. and H. Romdiati. 2000. Dampak Krisis Ekonomi Terhadap Kemiskinan dan Beberapa Implikasinya untuk Strategi Pembangunan. Makalah. *Prosiding Widyakarya Nasional Pangan dan Gizi VII*. Jakarta. 29 Pebruari - 2 Maret 2000. Hal : 193 – 243. (Indonesian).

Kartasurya, M. I. Food Pattern and Underfive Children Nutritional Status on Fishermen's Families in Semarang Utara. *J. Coast. Dev*. 2: 427-433

World Health Organization. *Measuring Changes in Nutritional Status*. 1983. WHO. Geneva.