Determining Factors in Improving Poor Family Food Security and Allocation of Food Consumption Cost Based on Indicators Status of Children's Nutritional Status

Tuti Gantini*, Nataliningsih Nataliningsih
Agribusiness Study Program
University of Winaya Mukti
Sumedang, Indonesia
*gantini.tuti.1963@gmail.com, natalihuseina@gmail.com

Gijanto Purbo Suseno
Management Study Program
Ikopin
Sumedang, Indonesia
ps_giyanto@yahoo.com

Abstract—**Family food consumption affects the food consumption of young children. The still high number of toddlers who have underweight indicates the need to be investigated for what causes it. In Bandung Regency showed that the number of toddlers with overweight was 1.79%, normal weight of 94.25%, underweight by 3.72%, and weight less body as much as 0.29%. This research was conducted in Mengger Village, Bandung City, using survey methods. Samples were taken by random sampling stratification method with a total of 64 families and analyzed using path analysis. The results showed that the Coping Mechanism effort contributed to the fulfillment of food needs (11%), performance of borrowing a family (63%), selling gold or household appliances (3%), mortgaging goods (6%) and utilizing a yard (8%). The average monthly consumption cost of food (Rp. 5,000,000 - to Rp. 750,000 -) as much as 57%. The biggest influence on the nutritional status of children under five is maternal nutrition knowledge (36.5%). The suggestion given is that the handling of the problem of food security for poor families is through increasing maternal nutrition knowledge and maintaining the preservation of local strength.**

Keywords: coping mechanism, toddler's nutritional status, food security

I. INTRODUCTION

Food security is a condition of fulfilling food for households which is reflected in the availability of sufficient food, both in quantity and type of nutrition, safe, cheap and affordable. So according to the FAO there are 3 important aspects that need to be considered in the concept of food security, namely 1) food availability, 2) food stability and 3) access of individuals and / or households to get food (food accessibility) by therefore the availability of food at the national level does not guarantee the fulfillment of food consumption at the household level. Low socio-economic community groups (poor) with all its limitations are groups that are vulnerable to food shortages. With various efforts they try to be able to achieve the level of food security, due to social processes they are able to survive in adverse conditions by developing their own behavior (Coping Mechanism / CM).

The impact of reducing food security is one of them is the emergence of the problem of malnutrition, especially in children under five. Efforts to improve community nutrition as stated in the Health Law No. 36 of 2009 aims to improve the nutritional quality of individuals and the community, among others through improving food consumption patterns, improving nutritional awareness behavior, improving access and quality of nutrition and health services in accordance with scientific and technological progress. Nutrition improvement efforts are carried out gradually and continuously in accordance with the development of nutritional problems, phasing and development priorities in the region.

The number of poor people in West Java according to the Central Statistics Agency in 2018 is 7.25% or 3,615,000 people, spread in West Java [1]. The poor category here is because the food consumption is below Rp. 371,000 per month. In the city of Bandung, the number of poor people is 1300 families.

The low income of the community will impact on the low purchasing power of the community, the limited ability of the community to access food, as well as the limited ability of resources to develop micro small businesses that make them vulnerable to food insecurity [2].

The dominant cause of food insecurity is the large population poor in Central Java, seen from the percentage of pre-prosperous and prosperous families I of 49.65%. The prevalence of malnutrition in Boyolali is 17.33%, the prevalence is very short, 31.66%, and the prevalence of very thin is 2.27% [3].

Government programs undertaken to deal with malnutrition include: 1} the commitment of the central and regional governments to handle malnutrition cases in Indonesia, 2) Increasing public knowledge through campaigns relating to the prevention of stunting of infants, 3) through convergence and coordination of various parties to handling malnutrition cases, 4) counseling about nutritious food and 5) monitoring and evaluating to follow up on handling malnutrition in Indonesia.

West Bandung District Health Office Program allocates 1.2 M of expenditure for supplementary food programs for pregnant women and toddlers [4], which are channeled in collaboration with the Village Family Welfare Program (PKK) to the respective *Posyandu* given in the form of prepared foods when weighing toddlers and pregnant women that is once a month. Cases of malnutrition in West Bandung out of 13,763 toddlers there are 27 toddlers suffering from malnutrition and 1 person died in 2018.

According to the Department of Health, nutrition vulnerability is divided into 3, namely 1) the category of poor nutrition, malnutrition and poor nutrition, 2) the Stunting category, which is short and very short, and 3) the thin category, which is thin and very thin. Weighing every month should be able to monitor the development of toddlers so that early detection of nutrient-prone to toddlers can be done. Appeal for mothers who have toddlers to attend the *posyandu* for weighing their toddlers so that the *posyandu* database can always be up to date [5].

Family level food security supports the level of protein consumption so that the better the food security of the family, the level of protein consumption will also be better. The value of the level of protein consumption is caused by the tendency to consume tofu, tempeh, eggs, and milk in sufficient quantities every day [6]. This is motivated by the convenience factor in getting tofu, tempeh, and eggs so that it becomes a household choice for consumption, conversely families who cannot stand or lack food security then consume more carbohydrates every day so that toddlers lack protein nutrients and suffer from marasmus or khuarshiokor, marked by a thin body with a big belly [7].

Based on the results of nutrition program activities in 2016 conducted by the Bandung District Health Office [8], it can be seen from the scope of the results of monthly growth monitoring at the *posyandu* that is the scope of community participation to bring the toddler to come and weigh in the *posyandu* (D / S coverage) has not reached the target of 81.7 % (2016 target of 87%). Whereas the nutritional status of children under five years of age (malnutrition) in 2016 was 0.039% (as many as 107 children) when compared to 2015 there was a decrease of 0.003% as well as 2016 underfives of stunting by 6.80%. A decrease of 2.09%. Most of the cases of malnourished children under five are due to parenting and lack of knowledge and skills of mothers of toddlers on how to feed their children. This is certainly necessary for the delivery of information to mothers who have toddlers about healthy food for their children. Regional programs are carried out to reduce the problem of malnutrition by providing supplementary food once a month, but daily food consumption determines toddler nutrition [9].

Various efforts of the Bandung city government have been carried out through social assistance, educational assistance, health assistance and so on and currently the program undertaken is free of paying land and building taxes so that the money can be used for other purposes.

The selection of Mengger classified as poor, some people are agricultural laborers, whose land is now being developed by many developers, thereby reducing their arable land. So the researcher wants to know the extent to which the people of Mengger Village can maintain their food security.

II. RESEARCH PURPOSES

This research aims to:

- Knowing the coping mechanism (CM) efforts in poor families in achieving food security.

- Knowing the cost of food consumption in poor families in meeting their nutritional needs.

- Knowing the social factors that influence the nutritional status of children under five in poor families.

III. RESEARCH METHODS

This study uses a survey approach with proportional random sampling. The research subjects were poor families in Mengger Village, Bandung Kidul Subdistrict, Bandung City, with a total sample of 64 poor families, with. the food consumption is below Rp. 371,000 per month. There are 4 variables of Computing Mechanism, namely, 1) utilizing the medium of exchange (physical, means of exchange of living objects / animals and inanimate objects / gold), 2) borrowing (borrowing money paying money, borrowing rice/paddy paying money, borrowing rice /paddy paying rice / paddy, borrow money to pay rice paddy, borrow rice and pay labor), 3) get donations, 4) use the plot of land. To see social factors that influence the nutritional status of children under five include: 1) family income, 2) expenditure on food, 3) Energy consumption of children under five, 4) protein consumption of children under five, 5) father's education (as head of the family), 6) mother's education, 7) mother's nutritional knowledge, 8) number of family members, 9) frequency of illness of children under five. To find out the amount of consumption costs conducted a direct survey then presented into the rank per month.

IV. RESULTS AND DISCUSSION

A. CM Performance Factors that Affect the Business of Family Food Security

The results of research on the Mengger Village family in maintaining food security were carried out in various ways, some of the population were labor farmers, construction workers, security guards, drivers, workshops, knitted laborers with an average erratic monthly income spent on food and non-food expenses. Uncertain income affects both food and non-food producers so that they can sometimes save or have a high deficit, saving in the form of gold that is sold when they need money.

TABLE I.   CALCULATION OF AVERAGE INCOME AND EXPENSES PER MONTH

No	Description	Average value (Rp) per month /family
1	Income from basic work	998.260
2	Food expenditure	598.956
3	Non food expenditure	499.130
4	Total expenditure	1.098.086
5	Deficit	99.826

For poor families, the object of research is 64 families, the average food consumption is Rp. 371,000 per head of family. From the table above shows that every month, the average family experiences a financial deficit, and the deficit is getting bigger if it requires other more important financing such as sickness, paying for school, paying rent, repairing or buying something. To maintain food security to meet needs as well as to cover deficits, various efforts have been carried out which are behaviors that have often been carried out so far with the description seen from the figure below:
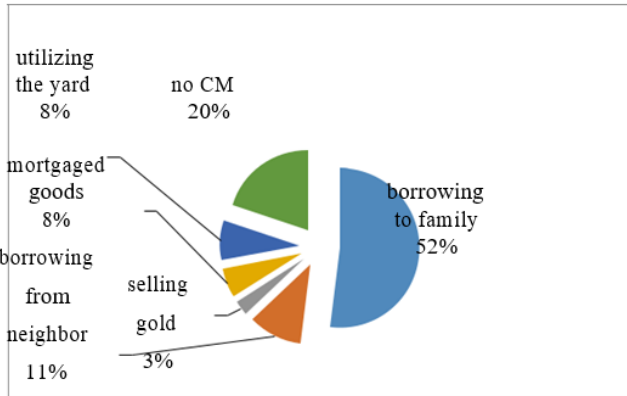

Fig. 1. Performance of respondents in CM and not CM efforts.

This activity is usually carried out by residents of Mengger Village to maintain food security. The relationship between the results of the CM effort with the Toddler Nutrition Status of the respondent's family in Mengger Village can be seen in the table below:

TABLE II. RELATIONSHIP OF CM AND NUTRITIONAL STATUS OF TODDLER

CM	Nutritional status of toddler					Total
	normal	*good*	*moderate*	*less*	*bad*	
With CM	10	20	12	8	1	51
Without CM	5	3	2	2	1	13
Total	15	23	14	10	2	64

From the table above shows the low number of people who make other efforts to meet food needs, which shows the number of children under five suffering from malnutrition in CM families is higher than those without CM. What is meant without CM is trying to fulfill its food security with other behavior (fasting or eating cassava). Whereas the behavior is CM, namely borrowing, selling, utilizing land, other assistance. Examples of other businesses done are trying to sell, add other jobs, become laborers in the city and so on.
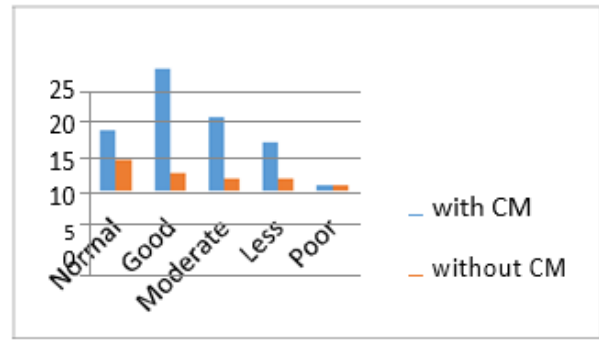

Fig. 2. Number of families who maintain their own behavior in maintaining family food security and nutritional status of their toddlers.

From the figure above shows that the high number of families who maintain their own behavior in maintaining family food security and nutritional status of their toddlers. Various attempts were made to cover the lack of funds in maintaining family food security, meeting the nutritional elements of the family's intake and still meeting other needs.

B. *Food Consumption Costs of Poor Families to fulfill Their Nutrition Needs*

The definite income or principal income is still divided again for food needs and non-food needs with the following performance:

TABLE III. CALCULATION OF INCOME AND EXPENSES PER MONTH

No	Description	Average value (Rp) per moth/family
1	Income from basic Work	998.260
2	Food expenditure	598.956
3	Non food expenditure	499.130

From the table above shows the allocation of each income, namely for food and non-food. Total income from basic work is Rp 998,260, - while total expenditure is more than income so that each family tries to meet those needs through CM and without CM.

Food expenditure with a total value of Rp. 598,956 per month for 1 family, which on average with 2 children under five is used to buy the main staple foods namely rice, milk, cooking oil, eggs, tofu, tempeh with the following budget allocation:

TABLE IV. DESCRIPTION OF BASIC FOOD CONSUMPTION IN MONTHLY FAMILIES

No	Type of food	Weight	Price (RP)	Total price (Rp)
1	Rice	10 Kg	9.000/Kg	90.000
2	Dancow milk	4 dos @ 400gr	34.000/dos	156.000
3	Cooking oil	3 litre	11.000/l	33.000
4	Chicken eggs	2 Kg	22.000/Kg	44.000
5	Tofu and *tempe*			40.000
6	Vegetables			200.000
7	Sugar	1 kg	18.000/Kg	18.000
8	Othes			100.000
	Total			641.000

From the table above shows that the consumption of protein from toddlers is obtained from milk *dancow* and chicken eggs with the amount of consumption of 1 dos of milk weighing 400 grams for 1-week consumption and 8 eggs for 1 week, this amount is very low because of the minimum protein requirements of toddlers every day is 0.33 mg / per kg body weight and for adults is 0.52 mg / per kg body weight. For toddlers, protein intake until 1-year-old is very important for the formation of the brain which reaches 90% of brain volume. Lack of protein intake can reduce brain volume and weight which have an impact on Intellectual Question levels for toddlers [10].

For toddlers after the age of 6 months, the consumption of protein comes from breast milk (ASI) and breast milk substitutes (MP ASI), one of the basic ingredients is milk, eggs, cornstarch to stimulate the work of the toddler's stomach. The order of adding food, namely ASI, MP ASI, filtered foods and soft foods that must be given to toddlers up to the age of 2 years according to the opinion thus requires separate costs to provide food consumption for the toddler, which is to maintain household food security, then usually the consumption of toddlers is included with the consumption of the family itself [11].

C. Social Factors Affecting the Condition of Toddler Nutrition Status in Poor Families

A mother's abilities and skills determine her toddler's growth and development. The element of mother's education with the development of her insight can plan, overcome and implement so that healthy families and toddlers grow normally. High protein requirements for toddlers at the age of 1 year can be fulfilled with various sources of animal and vegetable protein. How to choose a protein source does not have to be seen from the price but more complete types of amino acids both essential and non-essential, so as to complement the growth and development of toddlers [12].

The results of research in the village of Mengger using path analysis determined based on socioeconomic factors on the nutritional status of children under five. These factors are family income (X1), food expenditure (X2), energy consumption of children under five (X3), protein consumption of children under five (X4), father's education (X5), mother's education (X6), nutritional knowledge of mothers (X7), the number of family members (X8) and the frequency of illness of children under five (X9) as the independent variable and the dependent variable is the nutritional status of children under five.

The results of data analysis using the F test, resulting in a calculated F value = 5.23 while the F table = 2.38 with a real level α = 5%, a significant conclusion which means that food expenditure, father's education, maternal education, maternal nutrition knowledge and the number of member's families together have a real influence on the energy consumption of children under five. therefore, further analysis uses a t test with the following results:

TABLE V.   TESTING RESULTS FOR INFLUENCING FACTORS TOWARDS TODDLER NUTRITION STATUS

Factors	t count	Results *)
Family income (X1)	8,2347	Significant
Food expenditure (X2)	-5,8866	Non significant
Energy consumption of children under five (X3)	5,5766	Significant
Protein consumption of children under five (X4)	-0,4594	Non Significant
Father's Education (X5)	-0,0346	Non significant
Mother's Education (X6)	-1,3456	Non Significant
Mother's nutritional knowledge (X7)	19,7496	Significant
Number of family members (X8)	2,6153	Significant
Frequency of illness of children under five (X9)	-8,4725	Non significant

Note: *) Significant results at α = 5%, t table = 1.6749.

From the table above shows the factors that influence the nutritional status of children under five are family income, energy consumption of children under five, maternal nutrition knowledge and the frequency of illness of children under five, the higher the nutritional status of children under five the better. So that further analysis needs to be carried out the magnitude of influence of each variable that is significant to the nutritional status of children under five using path analysis with the following results:

TABLE VI.   THE MAGNITUDE OF THE INFLUENCE OF SOCIOECONOMIC FACTORS ON THE NUTRITIONAL STATUS OF CHILDREN UNDER FIVE

Factors	Influence (in%)		
	Direct	*Indirect*	*Total*
Family income	1,5696	Through X2 and X3 = 0.15556	1,7252
Energy consumption of children under five	0,5684		1,6891
Mother's nutritional knowledge	34,3927	Through X9 = 1.1207	36,5456
Frequency of illness of children under five	7,5914	Through X3 = 2.1529	8,7121
Others		Through X3 = 1.1207	46,5370

From the table above shows that the nutritional knowledge of mothers in this study has the greatest influence on the nutritional status of children under five. The position of the mother is very strategic in efforts to improve or improve the nutritional status of the community through her toddlers, so that the policy that can be taken in order to improve the nutritional status of children under five is to increase the mother's knowledge related to nutrition and growth and development of infants through counseling, seminars, training and reading books that are related to nutrition and toddler development. This is the same as the condition of other *Posyandu* members, because of a lack of knowledge about nutrition, it can have an impact on the nutritional status of their toddlers [13].

V. CONCLUSION

- Coping Mechanism contributes 11% to the fulfillment of food needs, with a family borrowing performance of 63%, selling gold or household items by 3%, mortgaging goods by 6% and utilizing a yard of 8%

- Monthly average food consumption costs are between Rp. 500, - Rp. 750,000, - as much as 57%

- The biggest influence on the nutritional status of children under five is maternal nutrition knowledge of 36.5%.

- Handling the problem of food security of poor families in order to maintain a good nutritional status of children under five is through increasing maternal nutrition knowledge as well as maintaining the preservation of local strength.

REFERENCES

[1] BPS, BPS (Badan Pusat Statistik) Jawa Barat , Bandung, Jawa Barat, 2018.

[2] R. Ediwiyati, D. Koestiono, and B. Setiawan, "Analisis ketahanan pangan rumah tangga (Studi kasus pada pelaksanaan program desa mandiri pangan di Desa Oro Bulu Kecamatan Rembang Kabupaten Pasuruan)," Agricultural Socio-Economics Journal, vol. 15, no. 2, p. 85, 2016.

[3] A.M. Safitri, D.R. Pangestuti, R. Aruben, "Hubungan Ketahanan Pangan Keluarga dan Pola Konsumsi dengan Status Gizi Balita Keluarga Petani," Jurnal Kesehatan Masyarakat Undip, vol. 5, no. 3, 2017.

[4] Anonim, 2018. SUSENAS, BPS, Jawa Barat.

[5] E.L. Prado and K.G. Dewey, "Nutrition and brain development in early life," Nutrition Reviews, vol. 72, no. 4, pp. 267–284, 2014.

[6] J.J. Strain, E.M. McSorley, E. van Wijngaarden, R.W. Kobrosly, M.P. Bonham, M.S. Mulhern, and G.E. Watson, "Choline status and neurodevelopmental outcomes at 5 years of age in the Seychelles Child Development Nutrition Study," British journal of nutrition, vol. 110, no. 2, pp. 330-336, 2013.

[7] M.M. Black, "Effects of Vitamin B 12 and Folate Deficiency on Brain Development in Children." Food and Nutrition Bulletin, vol. 29, no. 2_suppl1, pp. 126– 131, 2008.

[8] Anonim, Hasil Evaluasi Kinerja Posyandu, Dinkes Kabupaten Bandung, 2016.

[9] Anonim, Program Makanan Tambahan Anak Balita dan Sekolah (PMTAS), Dinkes Kabupaten Bandung, 2018.

[10] N. Steyn, J. Nel, G. Nantel, G. Kennedy, and D. Labadarios, "Food variety and dietary diversity scores in children: are they good indicators of dietary adequacy?" Public Health Nutrition, vol. 9, no. 05, pp. 644– 650, 2006.

[11] N.F. Krebs, "Food choices to meet nutritional needs of breast-fed infants and toddlers on mixed diets," The Journal of Nutrition, vol. 137, pp. 511S-517S, 2007.

[12] A. Nyaradi, J. Li, S. Hickling, J. Foster and W.H. Oddy, "The role of nutrition in children's neurocognitive development, from pregnancy through childhood," Frontiers in Human Neuroscience, vol. 7, pp. 1–16, 2013.

[13] E. Ernawati, H. Halida, and H. Djewarut, "Pengaruh penyuluhan kesehatan terhadap peningkatan pengetahuan ibu tentang status gizi balita di posyandu wilayah kerja puskesmas antang perumnas makassar." Jurnal Ilmiah Kesehatan Diagnosis, vol. 2, no. 2, pp. 6-10, 2013.