Community food pattern and nutrition among toddlers in district of Pacitan, East Java, Indonesia

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Abstract. Aim of this study was to asses and formulate food consumption patterns among under five children in accordance with the desirable dietary pattern score and Recommended Dietary Allowances to the target of East Java’s desirable dietary pattern. Toddlers who have nutritional status less than normal are 29.44%. Toddlers with good nutritional status are 59.39% and obesity toddlers are 11.16%. Families of respondents were able to provide the food of the crop and compound (p = 0.81; r = 0.11). The ability of the respondent's family to buy vegetables with p = 0.06; r = 0.19. Animal side dish food spending patterns showed that the family of respondents who consume meat poultry, including eggs was 92.1%. Families fruits spending patterns of respondents was 70.8% had a habit of eating fresh fruit so that every day can be provided. The pattern of food consumption in Pacitan already reflected the pattern of nutritionally balanced food, especially in the fulfillment of carbohydrates, vegetables-sourced protein, animal-sourced protein. Nutritional status of toddlers was ideal. The main driving factor for the improvement of nutritional status of toddlers was nutrition awareness against food diversification.

1. Introduction
Recently, there are a lot of researchers who determine that the relationship among starvation, nutritional imbalance and prevalence of both infection and degenerative illnesses cannot be separated from the problem of food security at family level and Desirable Dietary Pattern at community level, particularly in Pacitan District, East Java [1].

The Desirable Dietary Pattern is defined as a composition of a variety of food or food groups based on their contribution of energy, both in absolute and relative contribution to the total energy in terms of the availability and the consumption of food, which is able to meet the needs of nutrition to consider various aspects including social, economic, cultural and religious aspects as well as the taste [2].

In Pacitan District, the highest nutritional problems include malnutrition, imbalance composition of the dishes and insufficiency of the overall consumption to support the body. Toddlers (1-5 years old) are the age group that most often suffer from Protein Energy Deficiency.
Based on the results of Nutritional Status Monitoring survey in 2001, the energy consumption in Pacitan was 2,279 cal / person / day. The amount of energy, which was about 190.10 cal or about 8.34% of the energy contribution were from tubers. Cassava and various processed products were still widely consumed to substitute rice. Thus, Pacitan has the potential diversification of staple food items. Diversification of food sources of other nutrients needs to be studied further. Therefore, this study aimed to examine the patterns of food and the nutritional status of children under five years old in 12 villages in 12 subdistricts in Pacitan.

2. Experimental
This study was observational analytic with cross-sectional design. Retrieval and analysis of data was done in March-July 2014. Selection of research subjects was determined by purposive sampling. A number of 197 toddlers under five years old in Pacitan District were included in this study. Data / information was collected by observation, interviews, questionnaires, and focus group discussions. Toddler’s food pattern data per Subdistrict was measured according to the Recommended Dietary Allowance (RDA). Data were analyzed using Chi-Square. The concluding result will be used to formulate recommendations for the Office of Food Security and Public Health Service in Pacitan.

3. Result and Discussion
3.1. Result
The choice of location was done with consideration of their village community nutritional problem such as toddlers malnutrition. The average education level was high school with employment status in private sector (trader, farmers, fishermen) with a value of \( p = 0.175; r = 0.74 \). Families of respondents were able to provide the food of the crop and compound \( p = 0.81; r = 0.11 \). The ability of the respondent's family to buy vegetables (vegetable side dishes) with \( p = 0.06; r = 0.19 \). Animal side dish food spending patterns showed that the family of respondents who consume meat poultry, including eggs was 92.1% \( p = 0.00; r = 0.921 \). Families fruits spending patterns of respondents was 70.8% had a habit of eating fresh fruit so that every day can be provided papaya, banana, water guava which were bought from fruit sellers around each village \( p = 0.02; r = 0.708 \).

Table one shows the result study of respondent’s characteristics in 12 villages, includid number of respondents, average family member, average of mother’s education level and average of household’s salary per month.

| Name of villages         | Number of Respondents (person) | Number of family | Level of Education | Family income (Rupias) |
|--------------------------|--------------------------------|-----------------|-------------------|------------------------|
| Arjosari                 | 25                             | 3-4             | SMP-SMA           | 220000±200000          |
| Belah, Donorejo          | 40                             | 3-4             | SMP-SMA           | 137500±200000          |
| Dersono, Pringkuku       | 13                             | 3-4             | SMP-SMA           | 423100±200000          |
| Jatigunung Tulakan       | 8                              | 3-4             | SMP-SMA           | 687500±200000          |
| Jeruk Bandar             | 13                             | 3-4             | SMP-SMA           | 423100±200000          |
| Kebonagung               | 11                             | 3-4             | SMP-SMA           | 500000±200000          |
| Punung                   | 15                             | 3-4             | SMP-SMA           | 370000±200000          |
| Pagerejo, Ngadirojo      | 24                             | 3-4             | SMP-SMA           | 830000±200000          |
| Pakisbaru Nawangan       | 16                             | 3-4             | SMP-SMA           | 347000±200000          |
| Sirnobyoyo, Pacitan      | 6                              | 3-4             | SMP-SMA           | 333000±200000          |
| Sudimoro                 | 12                             | 3-4             | SMP-SMA           | 458000±200000          |
| Tegalombo                | 16                             | 3-4             | SMP-SMA           | 347000±200000          |

Statistic test \( p=0.00; r=0.99 \), \( p=0.459; r=0.222 \), \( p=0.367; r=0.187 \), \( p=0.474; r=0.430 \)

Source: Primary data processed in 2014.
According to table 1 it can be seen that the average number of family members as much as 3-4 people per household (p = 0.0459; r = 0.222). This means that statistically there is not real difference between the number of families in the rural area with a village in the central district, that every family have three to four members. Table 2 shows analysis of nutritional status and feeding frequency among toddlers at posyandu in District of Pacitan, East Java.

### Table 2. Analysis of nutritional status dan feeding frequency among toddlers (n=197)

| Nutritional status of toddlers | Feeding frequency (per day) | TOTAL (%) |
|------------------------------|-----------------------------|-----------|
|                              | >3x per day                 | 3x per day | <3x per day |          |
| Thin                         | 6                           | 51         | 1           | 58 (29.44%) |
| Good (normal)                | 4                           | 110        | 3           | 117 (59.39%) |
| Obesity                      | 2                           | 20         | 0           | 22 (11.16%)  |
| Total                        | 12 (6.09%)                  | 181 (91.87%) | 4 (2.03%)   | 197 (100%)  |

Source: Primary data processed in 2014

According to table 2, there were found some toddlers who eat fewer than three times per day. There were four toddlers (2.03%) who had nutritional inadequacy which was not correspond to the recommended dietary allowance. However, when viewed from the statistical analysis was not significant (p = 0.079; r = 527). This is in accordance with the WHO agreement stating malnutrition in the community will be a public health problem if it happens more than 5%.

### Table 3. Analysis of the nutritional status and pattern of milk drinking among toddlers

| Nutritional status of toddlers | Milk drinking frequency per day | TOTAL (%) |
|--------------------------------|---------------------------------|-----------|
|                                | never                           | Rarely    | often     | every day |          |
| Thin                           | 0                               | 22        | 22        | 16        | 60 (30.15%) |
| Good (normal)                  | 4                               | 11        | 40        | 62        | 117 (58.79%) |
| Obesity                        | 0                               | 2         | 6         | 14        | 22 (11.06%)  |
| Total                          | 4 (2.01%)                       | 35 (17.59%) | 68 (34.17%) | 92 (46.23%) | 199 (100%) |

Source: Primary data processed in 2014

Based on table 3 it can be seen that there were four toddlers (2.03%) who were not consume the milk. It was found that 35 toddlers (17.17%) who rarely drank milk. This shows the habit of milk consumption among toddlers is still not appropriate with Recommended Dietary Allowances (RDA). However, when viewed from the statistical analysis there was a significant relationship (p = 0.000; r = 0.277) between nutritional status and milk consumption habits. Furthermore, there were 27.7% nutritional status of toddlers who were not affected by the consumption habits of milk.

Here is a description of the consumption of Pacitan District residents during the study period in the energy, the percentage of Nutrition Adequacy Score, and scores Desirable Dietary Pattern which have been recorded from March to May 2014. The food group in the Desirable Dietary Pattern are nine items (Hardinsyah and Martianto, 1992):

a. Rice - the food grains from cereals commonly as a staple food.
b. Bulbs - tubers which is the food of roots or tubers are edible.
c. Animal food is a food of animal and preparations.
d. Oils and fats are of vegetable foodstuffs that have fat and oily and fat from the animal.
e. Oily fruit and seeds are good food containing oils from fruits and seeds.

f. Nuts - Nuts are seeds that contain high levels of fat.

g. Sugar and the processed products.

h. Vegetables and fruits.

i. Others which are condiments.

Table 4. Calculation results of Desirable Dietary Pattern (DDP) residents in Pacitan

| number | Food group                        | Energy (Kal) standart | Energy (Kal) Pacitan | % DDP standart | % DDP Pacitan | Quality | DDP score |
|--------|-----------------------------------|-----------------------|----------------------|----------------|--------------|---------|-----------|
| 1      | Rice                              | 1100                  | 1000                 | 50             | 45.45        | 0.5     | 22.725    |
| 2      | Bulbs                             | 132                   | 172                  | 6              | 7.82         | 0.5     | 3.91      |
| 3      | Animal food                       | 264                   | 214                  | 12             | 9.72         | 2       | 19.44     |
| 4      | Animal food                       | 220                   | 185                  | 10             | 8.41         | 0.5     | 4.205     |
| 5      | Oils and fats                     | 66                    | 56                   | 3              | 2.54         | 0.5     | 1.27      |
| 6      | Nuts                              | 110                   | 100                  | 5              | 4.54         | 0.5     | 2.27      |
| 7      | Sugar and the processed products  | 110                   | 85                   | 5              | 3.86         | 0.5     | 1.93      |
| 8      | Vegetables and fruits             | 132                   | 105                  | 6              | 4.77         | 5       | 23.85     |
| 9      | Others which are condiments       | 66                    | 55                   | 3              | 2.5          | 0       | 0         |

Total: 2200 1972 100 89.61 79.6

Source: Primary data processed in 2014.

Based on table 4 it can be seen the level of nutrient consumption of energy intake on the respondent (mother) 1972 Kal per day with desirable dietary pattern amounted to 89.61%. When compared with the value of Recommended Dietary Allowance (RDA), it can be assessed the adequacy of each nutrient. Energy and protein sufficiency level most of the respondents were already quite good (> 80% RDA). There are about 181 of the 199 respondents (90.95%) have met the needs of energy and protein.
Table 5. Analysis of food diversification effort at household level (n=190)

| Name of Village      | No effort | Meal 3x per day | Effort of Diversification | Balance nutrition | Total      |
|----------------------|-----------|-----------------|---------------------------|-------------------|------------|
|                      |           | Meal with veg   | Meal with fruits | 4 sehat 5 sempurna |            |
| Arjosari             | 15        | 1               | 0                        | 0                 | 21(11.05%) |
| Belah, Donorejo      | 25        | 3               | 0                        | 0                 | 37(19.47%) |
| Dersono, Pringkuku   | 4         | 2               | 1                        | 1                 | 13(6.84%)  |
| Jatigunung Tulakan   | 4         | 0               | 0                        | 0                 | 8(4.21%)   |
| Jeruk Bandar         | 7         | 1               | 0                        | 0                 | 12(6.36%)  |
| Kebonagung           | 9         | 0               | 0                        | 0                 | 11(5.78%)  |
| Punung               | 6         | 3               | 0                        | 0                 | 14(7.37%)  |
| Pagerejo, Ngadirjo   | 11        | 4               | 0                        | 2                 | 24(12.63%) |
| Pakisbaru Nawangan  | 8         | 0               | 0                        | 0                 | 16(8.42%)  |
| Sirnoboypo, Pacitan  | 3         | 0               | 1                        | 0                 | 6(3.16%)   |
| Sudimoro             | 6         | 0               | 1                        | 0                 | 12(6.32%)  |
| Tegalombo            | 10        | 0               | 1                        | 0                 | 16(8.42%)  |

Total 108 (56.84%) 14 (7.37%) 4 (2.11%) 3 (1.57%) 41 (21.58%) 20 (10.52%) 190 (100%)

Value of p=0.68; r=0.94

Source: Primary data processed in 2014.

Analysis of food diversification effort at the household level which are an effort to be able to provide meal 3 times per day, eat vegetables, eat fruits after the main meal, eat with menu 4 healthy 5 perfect, and efforts to meet the nutritional balanced statistically showed no significant relationship with consumption patterns every day (p = 0.68; r = 0.94). Thus there were 94% of families that their nutritional adequacy did not depend on diversification efforts at the household level.

3.2. Discussion

The choice of location was done with consideration of their village community nutritional problem such as anemia in pregnant mothers and toddlers malnutrition. The average degree of anemia in pregnant mothers were mild (hemoglobin levels of more than 10 g / dl). The average education level was high school with employment status in private sector (trader, farmers, fishermen) with a value of p = 0.175; r = 0.74. Families of respondents were able to provide the food of the crop and compound (p = 0.81; r = 0.11). The ability of the respondent’s family to buy vegetables (vegetable side dishes) with p = 0.06; r = 0.19. Animal side dish food spending patterns showed that the family of respondents who consume meat poultry, including eggs was 92.1% (p = 0.00; r = 0.921). Families fruits spending patterns of respondents was 70.8% had a habit of eating fresh fruit so that every day can be provided papaya, banana, water guava which were bought from fruit sellers around each village (p = 0.02; r = 0.708).
4. Conclusion
The pattern of food consumption in Pacitan already reflected the pattern of nutritionally balanced food, especially in fulfillment of carbohydrates, vegetable protein, animal protein. Nutritional status of toddler was ideal, but there were still two villages with under nutrition. Posyandu activities were quite active in ensuring monitoring the nutritional status of toddler and pregnant women. The driving factor of nutritional status improvement of toddler was nutrition awareness against food diversification and driving factor of improving the nutritional status of pregnant women was the service of antenatal care (ANC). The level of nutrient consumption of energy intake on respondent (pregnant mother) was 1972 Kal per day with Desired Food Pattern percentage of 89.61. Level of energy and protein sufficiency among respondents were quite good (more than 80% RDA), which was about 90.95%.

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