ANTHROPOMETRIC INDEX OF CHILDREN WHO RECEIVE ADDITIONAL FEEDING BISCUITS

Budi Setyawati[1)], Noviati Fuada[2)], Nazarina[1)], Salimar[1)]

[1)]Center for Research and Development of Public Health, Indonesia
[2)]Magelang Health Research and Development Center

ABSTRACT

Background: After the first six months of exclusive breastfeeding, children are introduced to liquids and semi-solid food, known as the complementary feeding phase. This phase is critical because it is often accompanied by improper feeding in children, which may lead to wasting and other nutrition problems. Fortified biscuits have been provided for wasting children as a nationwide programme. However, the obedience of children to consume food supplementation remains questionable.
Subjects and Method: This was a cross-sectional study conducted at 28 districts in 11 Provinces in Indonesia, during 2017. A sample of 586 children under five was selected for this study. The dependent variable was anthropometric index. The independent variable was additional feeding biscuits. Anthropometric index was categorized by underweight, wasted, and stunted. The data was collected by questionnaire and reported in percents.
Results: A third proportion of sample had underweight-wasted-stunted (34.1%), followed by underweight-stunted (27.8%), underweight-wasted (20.3%), wasted (6%), stunted (4.8%), and only 7% with normal anthropometric index. As many as 74.6% of children under five received additional feeding biscuit regularly every month for 3 months. However, only 21.5% of them who consumed it appropriately.
Conclusion: The highest anthropometric index in children under five is underweightwasted-stunted. Consumption of additional feeding biscuits appropriately is still low.

Keywords: nutritional status, children under five, additional feeding biscuits, anthropometric index.

Correspondence:
Budi Setyawati. Center for Research and Development of Public Health. Jl. Percetakan Negara 23, Jakarta Pusat, Indonesia. Email: budi.setyawati.ipb@gmail.com. Mobile: 081229494859.

BACKGROUND

Children are the future of the nation. Toddler period is a critical period as well as a 'window of opportunity' for growth and development. Malnutrition at the age of under five is one of the most important public health problems and the risk of death. Malnutrition occurs if the consumption of nutrients is not sufficient for energy and growth needs (Burgess & Danga, 2008). Malnutrition at the age of toddlers has a negative impact in the future and is epigenetic (transmitted to the next generation) (Martins et al, 2011). In Indonesia, there were high nutritional problems in children under five in 2013 and 2018 both wasted (12.1% and 10.2%), stunted (37.2% and 30.8%) and underweight (19.6% and 17.7%) (Balitbangkes, 2018; Balitbangkes, 2013). There are as many as 55.7 percent of toddlers whose energy

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intake is less than the recommended adequacy (Balitbangkes, 2014).

In the Medium-Term Development Plan (RPJM) of the Government of Indonesia for 2015-2019, one of the indicators is that underweight toddlers get additional food (Kemenkes RI, 2015). In the 2020-2024 RPJMN, it is targeted that the prevalence of stunting will decrease to 19 percent and wasting 7 percent (Ministry of National Development Planning/Bapenas 2015; Presidential Regulation, 2020; Ministry of National Development Planning/Bappenas, 2019). The provision of nutritional supplements to children under five aims to fulfill their nutritional needs. One of them is through the Recovery Supplementary Food Program (PMT-P) for infants and toddlers (6-59 months) in the underweight category (indicator of WAZ <-2 SD) who are neither hospitalized nor outpatient. P in the form of biscuits with a special formula enriched with vitamins and minerals. Each pack contains 4 pieces (40 grams), contains 160 calories, 3.2-4.8 grams of protein, and 4-7.2 grams of fat. The recommendation of PMT-P every day is 8 pieces for children aged 6-11 months and 12 chips for children aged 12 months and over (Kemenkes RI, 2017).

Anthropometry is a method of assessing body size, proportion and composition. Anthropometric standards for children are set by the government as a reference in assessing the nutritional status and growth trends of children. Anthropometric standards for children consist of: weight for Age (WAZ), height for age (HAZ), weight for height (WHZ), and body mass index for age (BMI/age). Nutritional status was assessed by comparing the measurement results with the child's anthropometric standard. The HAZ index identifies children who are severely stunted/ stunted. The WAZ index identifies underweight. The WHZ index classifies stunted/ severe stunted. The HAZ index tends to assess past nutritional status (chronic malnutrition) while the WAZ index assesses acute malnutrition (WHO, 2013; Soetjiningsih and Ranuh, 2017). Underweight is the easiest to measure and reflects wasting, acute weight loss, stunting or a combination thereof, but is a combined indicator and difficult to interpret (WHO, 2010).

This study studied the combination of the anthropometric index of children under five receiving PMT-P biscuits, the routine of children getting PMT-P biscuits, compliance with the provisions on the number of PMT-P received and consumed which were grouped according to the combination of nutritional status.

SUBJECTS AND METHOD

1. Study Design

This was a cross sectional study carried out in 28 districts from 11 provinces (North Sumatra, Riau, Banten, East Java, NTT, South Kalimantan, West Kalimantan, North Sulawesi, South Sulawesi, Maluku, North Maluku) in 2017.

2. Population and Sample

The population is children under five who receive PMT-P biscuits. Samples were children under five who received PMT-P biscuits who were selected as samples at the selected location. The sample selection is as follows:

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provincial selection based on representatives of 5 regions that have the highest prevalence of underweight children under five. Furthermore, in the province, 2 districts were selected with the highest prevalence of underweight children under five. The sample is based on the minimum sample calculation. The data analyzed were 586 children.

3. Definisi Operasional Variables

The combination of anthropometric index (nutritional status) is a combination of the assessment of each z-score index of WAZ, HAZ, and WHZ which category refers to the anthropometric standard of children (Ministry of Health, 2020).

The routine of getting PMT-P biscuits is the routine of children under five getting PMT-P biscuits every month for 3 months.

Getting PMT-P according to the provisions is getting PMT-P biscuits in the amount according to the provisions in the PMT-P Technical Guidelines for underweight children (Kementerian kesesehatan, 2017) from children who always routinely get PMT-P every month within a period of 3 months.

Consuming a number of PMT-P biscuits in accordance with the provisions is consuming PMT-P biscuits in the amount according to the provisions in the PMT-P Technical Guidelines for underweight children (Kemkes, 2017) from children who always routinely receive PMT-P in the amount according to the provisions in the PMT-P Technical Guidelines on thin children (Kemkes, 2017) every month within 3 months.

4. Study Variable

The variables of this study are a combination of anthropometric index (nutritional status), the routine of children getting PMT-P, getting a number of PMT-P biscuits according to the provisions, consuming a number of PMT-P biscuits according to the provisions.

5. Instrument

The instruments used are structured questionnaires and records of the results of anthropometric measurements of children at the beginning/ determination as PMT-P recipients carried out by village cadres/midwives which are then confirmed (re-measured) by the TPG.

6. Data Analysis

The analysis was performed using a univariate test. The combination of anthropometric indices (nutritional status) of children under five receiving PMT-P biscuits is presented. Also presented is the routine of toddlers receiving PMT-P, receiving and consuming PMT-P according to the provisions according to a combination of anthropometric indices. Provisions on the number of PMT-P biscuits given and consumed refer to the Technical Instructions for Providing Supplementary Food (Kemenkes RI, 2017).

7. Research Ethics

Research ethics from the Research Ethics Commission of the Health Research and Development Agency of the Indonesian Ministry of Health. Number: LB.02.01/2/ KE.112¬/2017. Issued in Jakarta on March 31, 2017.

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RESULTS

The characteristics of children under five who received PMT-P biscuits in this study were as follows:

Toddlers receiving PMT-P biscuits consisted of 45.5 percent of boys and 54.5 percent of girls. Most of the mothers who received PMT-P received low education, followed by secondary education.

Table 1. Subject Characteristics

Characteristics	Category	N	Percentage
Gender	Male	267	45.6
	Female	319	54.5
Maternal education	Non formal education	28	4.8
	Uneducated	41	7.0
	Primary school	159	27.1
	Junior high school	126	21.5
	Senior high school	194	33.1
	College	38	6.5

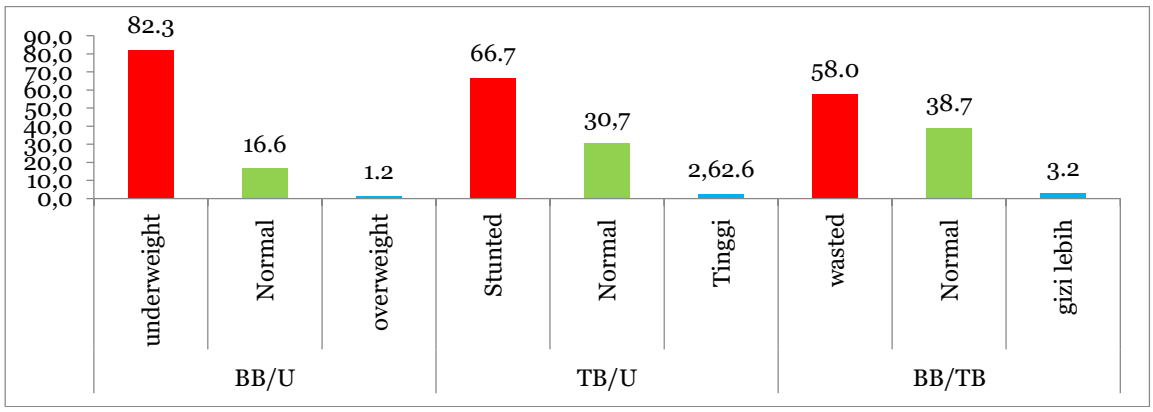

Figure 1. Percentage of Nutritional Status of Children Under five who Received PMT-P Biscuits at the Time of Determination/First Time Receiving PMT-P Program

It can be seen that based on the anthropometric index of WAZ, most of them are underweight (82.3%), the percentage is very small for overweight (1.2%). Judging by the anthropometric index of HAZ or WHZ, most of them were stunted (66.7%) and a third were normal (30.7%). If viewed based on WHZ, more than half (58%) were wasted.

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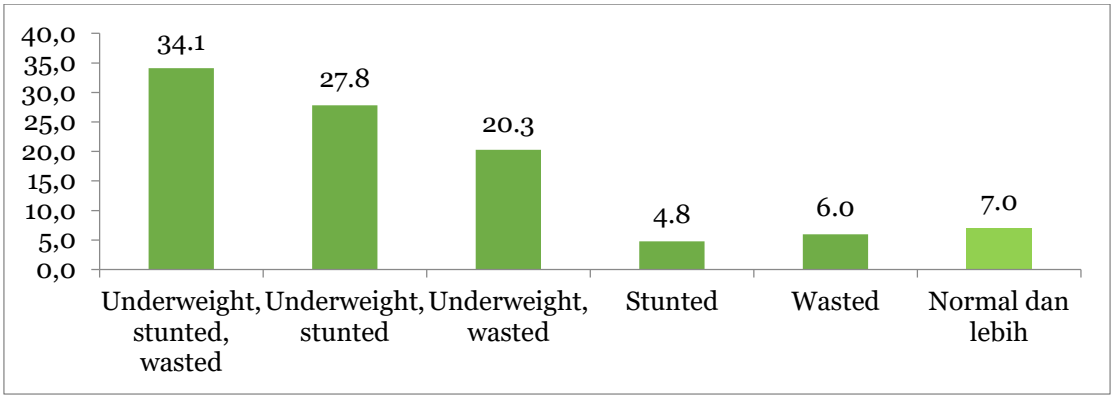

Figure 2. Percentage of Target Anthropometric Index Combinations Toddler Children Recipient of PMT-P Biscuits During Determination/ First Time Receiving PMT-P

The combination of 2-3 anthropometric indices namely HAZ with WHZ and WAZ shows more clearly the nutritional problems of toddlers receiving PMT-P biscuits. Many children have a combination of 2-3 nutritional problems at the same time. The highest percentage of underweight-stunted-wasted combinations (34.1%), followed by underweight stunted (27.8%), underweight-wasted (20.3%), stunted (4.8%), wasted (6%) and normal and more (7%).

Table 2. Percentage of target routines for toddlers receiving PMT-P Biscuits in 3 months according to the combination of Anthropometric Index

Combination of Nutritional Status	1 months	2 month	3 months
Underweight, stunted, wasted (200)	9	13.5	77.5
Underweight, stunted (163)	15.3	13.5	71.2
Underweight, wasted (119)	9.2	10.1	80.7
Stunted (28)	28.6	25	46.4
Wasted (35)	17.1	20	62.9
Normal and more (41)	4.9	9.8	85.4
Total (586)	11.9	13.5	74.6

In general, the percentage of receiving PMT-P regularly is quite large (74.6%), the rest getting one month (11.9%) and two months (13.5%). The highest percentage of receiving PMT-P biscuits was normal (85.4%) followed by underweight-wasted (80.7%), underweight-stunted-wasted (77.5%).

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Table 3. Percentage of Toddlers Receiving A Number of PMT-P Biscuits in accordance with the Provisions from PMT-P Recipients regularly in 3 months

Combination of Nutritional Status	3 months received less than the terms	1 month received according to conditions	2 months received according to conditions	3 months received according to conditions
Underweight-stunted-wasted (155)	72.9	5.2	1.3	20.6
Underweight-stunted (116)	65.5	8.6	1.7	24.1
Underweight-wasted (96)	76	1	1	21.9
Stunted (13)	84.6	0	0	15.4
Wasted (22)	77.3	0	4.5	18.2
Normal and more(35)	77.1	5.7	0	17.1
Total (437)	72.5	4.8	1.4	21.3

*) Provisions on the number of PMT-P are given to children aged 6-11 months as many as 8 pieces per day and to children aged 12-59 months as many as 12 pieces per day.

Only 21.3 percent get a number of PMT-P biscuits according to the provisions every month in 3 months. The largest percentage of underweight-stunted children (24.1%) was followed by underweight-stunted-wasted (20.6%). The smallest percentage in normal and over (17.1%).

Table 4. Percentage of Toddlers Consuming PMT-P Biscuits from Recipients of a Number of PMT-Ps according to the provisions in 3 months

Combination of Nutritional Status	3 months less than the provisions	1 month according to conditions	2 months according to conditions	3 months according to conditions
Underweight-stunted-wasted (32)	75	3.1	3.1	18.8
Underweight-stunted (28)	57.1	14.3	7.1	21.4
Underweight-wasted (21)	66.7	4.8	4.8	23.8
Stunted (2)	50	50	0	0
Wasted (4)	50	0	25	25
Normal and more (6)	66.7	0	0	33.3
Total (93)	65.6	7.5	5.4	21.5

*) Provisions for PMT-P are consumed in children aged 6-11 months as much as 8 pieces per day and in children aged 12-59 months as many as 12 pieces per day.

As many as 21.5 percent of children consume PMT-P biscuits in the amount according to the provisions, the rest (78.5%) consume less than the provisions. Children with normal nutritional status and above had the highest percentage (33.3%) in consuming PMT-P biscuits according to the provisions, followed by wasted (25%) and underweight-stunted (23.8%). The lowest percentage was found in stunted (0%) and underweight-stunted-wasted children (18.8%).

DISCUSSION

The combination of anthropometric index assessment shows nutritional

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problems in children under five in more detail and detail. The largest percentage of underweight-stunted-wasted nutritional problems (34.1%), interpreted that most of these children had a history of malnutrition or nutritional problems that had lasted a long time, occurred in the past and continue to the present. Underweight-stunted and stunted nutrition problems can be interpreted as having a history of malnutrition. Underweight-wasted and wasted indicate acute malnutrition (Bardosono, 2021). WHO (2010) stated that stunting reflects the slowed growth of the cumulative long-term effects of malnutrition, repeated infections and indicates poor environmental conditions. Wasting describes acute malnutrition due to insufficient intake or infectious diseases, especially diarrhea. Stunting is an indicator of chronic malnutrition while wasting is an indicator of acute malnutrition (The Center for Human Nutrition, 2002).

The indicators of WHZ and HAZ reflect past nutritional status, the parameter of height is more stable (Handayani et.al, 2012). Children under five with multiple malnutrition are more at risk of suffering from ARI, diarrhea and measles than children under five with a single malnutrition problem. Therefore, children under five with malnutrition and underweight and wasting need to get immediate intervention in the form of PMT, medication, micronutrient provision, education and family empowerment (Widodo et.al, 2010).

In the PMT-P technical guidelines (2017), it is stated that the main target of PMT-P is thin children under five who are not hospitalized/ outpatient. The results of the analysis show that PMT-P is not only given to children with wasted status. Provision of supplementary food recovery in underweight toddlers as much as 58 percent. PMT-P recipients who are not thin are not against the rules. The technical guidelines state that thinness is the main target, other conditions can be the next target. The PMT-P technical guidelines (2012) describe the priority order of criteria for toddlers receiving PMT-P, namely toddlers in the recovery period after malnutrition treatment at health center, underweight toddlers and doesn't gain weight twice in a row (2T), underweight toddlers and children under the red line (Directorate General of Nutrition and Maternal and Child Health, 2012). Giving PMT-P to normal or overweight toddlers is advised not to do because of the risk of increasing body weight and overweight.

PMT-P is generally distributed routinely every month for 3 months (74.6%). This is related to the availability of PMT-P, planning and distribution of PMT-P by the health ranks (Health Office and Puskesmas). A good planner maps problems based on information, data and facts to achieve the desired results (Komal, Irwan, 2019). Not all who get PMT-P routinely get PMT-P in the amount according to the provisions. Only 21.3 percent get a number of PMT-P according to the provisions every month in 3 months. Constraints in the distribution of PMT-P both in terms of routine and the amount given, based on qualitative interviews, include geographical conditions (difficult to reach due to

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distance, damaged roads, uncertain weather and ship schedules), insufficient availability of PMT-P, lack of manpower and the absence of budget for distribution (Hermina, 2017).

Very few (21.5%) consume PMT-P according to the provisions that have been set every month for 3 months. In fact, consuming PMT-P as recommended is expected to help alleviate nutritional problems. Abidin receiving PMT-P can increase toddlers' body weight by 18.16 percent (Abidin, 2018). PMT-P recovery has also been shown to be effective in increasing the weight of undernourished children (Herionto, 2017). Another study found that giving MP-ASI biscuits for 90 days had an effect on increasing the nutritional status of toddlers based on WAZ and WHZ (Maheasy & Ulvie, 2018).

The Bappenas study found that the management of moderate/ underweight acute malnutrition was not comprehensive and only provided supplementary foods high in energy and protein without adequate support through counseling activities (Ministry of National Development Planning, 2019). Therefore, in addition to the need for smooth distribution of PMT-P from the center to the regions as needed to reach the target. Counseling and assistance for families and children under five are also needed in raising awareness of consuming a number of PMT-P according to the provisions.

The combination of underweight-stunted and wasted anthropometric indices has the highest percentage (34.1%), underweight-stunted (27.8%), underweight wasted (20.3%), stunted (4.8%), wasted (6%) and normal and more (7%)). Toddlers who received PMT-P biscuits every month for 3 months were 74.6 percent. Of PMT-P biscuit recipients regularly within 3 months, as much as 21.3 percent received PMT-P in the amount according to the provisions. For recipients of PMT-P biscuits according to the provisions within 3 months, 21.5 percent consumed a certain amount of PMT-P according to the provisions. It is necessary to examine the reasons for the target not to consume PMT-P according to the provisions in more depth so that the PMT-P program is more effective in improving the nutritional status of children.

AUTHOR CONTRIBUTION

Budi Setyawati played the main contribution in this paper, choosing the topic of writing, searching for literature, collecting data, analyzing data and writing articles. Nazarina enriches the topic of writing, data analysis. Noviati Fuada collects data, searches literature. Salimar collects data and literature.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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