

Morbidity and Wasting in Children under Five Aged 12–59 Months

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ABSTRACT

Background: Wasting or continuous low body weight can be a risk factor for stunting. This study will look at the Cases of wasting in children aged 12–59 months in South Batui District, Banggai Regency, Central Sulawesi Province. **Method:** This research implemented an analytical cross-sectional survey approach with children aged 12–59 months as subjects. The main variables of the study were nutritional status, weight/age, and morbidity. Data collection used a questionnaire with interview techniques and anthropometric measurements in children under five. Data analysis used bivariate study using a chi-square test. **Results:** Most of the mothers under five had a low level of education (Junior High School and lower). 76.1% housewives. 81.4% of families with income <2 million rupiah/month. The incidence of morbidity was 37%. These variables are not related because the results have a p value > 0.05. However, there was some tendency for child morbidity to co-occur with wasting (p = 0.143), and in looking for the sex of the child, p < 0.148. the average energy intake is 43% RDA, with specific intakes as follows: carbohydrates = 38.5% RDA, protein = 106% RDA, and fat = 38.4% RDA. No, micronutrients are still low. **Conclusion:** Morbidity in children was 36.7%, category -2 SD weight for age z score (WAZ) was 22%, and weight for height z score (WHZ) was 4.1%. Wasting is a determining factor, so there needs to be continuous handling to prevent nutritional problems in toddlers.

Keywords: Morbidity, Nutritional status, Toddler, Wasting

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Introduction

Malnutrition is one of the nutritional problems of today. According to the World Health Organization, malnutrition is a medical condition that is caused by an inadequate or incorrect intake or supply of nutrients. Malnutrition is often associated with inadequate nutrient intake, known as malnutrition, which can be caused by malabsorption [1].

According to the “conceptual framework of determinants of child malnutrition” and “factors causing nutrition problems in the Indonesian context” [2], the causes of nutrition problems are low food security (especially access to nutrients from food), the social environment associated with children (health care), access to health services, and environmental health, including the (environmental) availability of safe drinking water and sanitation facilities. These four factors indirectly affect the nutrient intake and health status of mothers and children [3]. Waste in children is caused by poor nutrient intake and disease. In these cases, children’s immune systems remain weak, there is a risk of long-term developmental delays, and an increased risk of death. Based on previous reports

on child malnutrition by UNICEF, the World Health Organization and the World Bank, global and regional projections reveal that we are still far from a world without malnutrition. Stunting, wasting, severe wasting and overweight are estimated to be very high among children under five in developing countries, including Indonesia [4].

A study of stunting and being underweight in highway children in northern Ethiopia showed that the child’s age, disease, and open defecation are closely related to the incidence of wasting [5]. Malnutrition was one of the main reasons for lumping together childhood illnesses and deaths, as well as infectious diseases, or both, in India and several other developing countries. Malnutrition accounts for half of all deaths each year in children under five years of age. Even today, health problems occur in children under the age of five in India and other developing countries [6]. Changes in eating patterns and the availability of junk food have an impact on the hazards associated with non-communicable diseases [7]. Children in developing countries eat unhealthy food due to a absence of awareness of good diet and a absence of understanding of nutritious food [8] and the understanding of food has evolved as a

source of nutrition, lifestyle, pleasure, degree of life, etc. [9]

The WHO estimates that around 150–200 million children under five in developing countries are underweight and stunted [10]. A study in India noted that underweight and undernourished children under five are common in village areas [11].

One of the areas with health problems is Central Sulawesi Province, Indonesia, particularly Banggai Regency with a population of 376,808 people in 2019 [12] (Banggai Regency in 2019 figures). In the health sector, the data from Riskesdas at the provincial level in Central Sulawesi shows that the prevalence of malnutrition in under-fives in 2018 was 4.84%, and the prevalence of malnutrition in general was 18.65%. The prevalence of malnutrition data in the Banggai district was 1.39%, and undernutrition was 15.63 [13].

Method

This research was conducted in the location of stunting focus, Banggai district, Central Sulawesi-in the district of South Batui to be precise. It consists of 10 main villages, namely Sinorang Village, Sukamaju, Maleo Jaya, Masungkan, Sukamaju I, Bone Belantak, Respective, Gorigori, Paisubuloli, and Ombolu. Research permits were obtained from the provincial government of Central Sulawesi, Banggai Regency; the Research Ethics Commission of the Faculty of Public Health, Hasanuddin University; and the research and development department (R&D) of the Banggai Regency government.

This study used a cross-sectional survey analytical method as subjects of children below five ages of age (12-59 months). Main variables of study were the nutritional status based on weight/age and the occurrence of diseases in children under five years of age that occurred two weeks before the data collection interview.

In the data collection process, health protocols were applied because of the COVID-19 pandemic situation, such as wearing masks, gloves, maintaining social distance and using hand sanitizers. Face-to-face interviews were carried out using pre-tested and structured questionnaires. The questionnaires were prepared on mobile phones using the Kobo Collect application (Indonesian version).

Standard procedures were carried out to estimate the anthropometric measurement indicators of the participants' bodies. The child's height was measured using a stadiometer as the child stood upright in the middle of the instrument. Each respondent stood up straight as per the prescribed procedure, with minimal clothing, and the measurement results were read to the nearest 0.1 cm and recorded.

The kid's weight was measured with a precision of 0.1 kg and a maximum weight of 180 kg using the Seka Portable Digital Scale. The children were measured without light clothing or shoes. The weight tool was calibrated, the average weight was recorded, and the nutritional status of the infant was determined using the WHO Entero application to minimize errors.

The information was analyzed using type 25 (SPSS). Descriptive statistics of frequency and proportion were used to summarize the study variables.

Result

Table 1 distribution of characteristics according to the building where respondents live, from a total of 306 respondents. The types of construction are permanent houses 40.20%, semi-permanent 6.54%, wooden houses 52.61%, and other types 0.65%. The wall types are brick 24.84%, concrete brick 19.28%, plywood 0.65, wood or bamboo 54.25%, and other types 0.96%. The floor types are tiles 17.79%, cement 49.67%, soil 2.29%, ceramic 0.98%, and wood or board 13.73%.

The number of families who have their own toilet is 73.53%, public toilet is 6.21%, riding with neighbors is 13.40%, river/pond/sea is 0.98%, bushes/open area is 0.98%. The incidence of morbidity in children is 36.27%.

Table 1: Distribution characteristics of residential buildings of respondents with toddlers in South Batui District, Banggai Regency in 2021.

Variable	n (306)	%
House Construction		
Permanent	123	40.20
Semi-permanent	20	6.54
Wooden house	161	52.61
Other	2	0.65
Wall Type		
Brick	76	24.84
Concrete brick	59	19.28
Triplex	2	0.65
Wood/bamboo	166	54.25
Other	3	0.98
Floor Type		
Tiles	55	17.97
Cement	152	49.67
Land	7	2.29
Ceramic	3	0.98
Wood/board	42	13.73
Other	3	0.98
Place to defecate		
Own toilet	225	73.53
Restroom	19	6.21
Neighbor's toilet	41	13.40
River/pond/sea	15	4.90
Bushes/open area	3	0.98
Other	3	0.98
Total	306	100.00
Has your child been sick in the last 2 weeks?		
No	195	63.72
Yes	111	36.27

Table 2 shows the characteristics of parents. Majority of father's age was 21-30 years (41.5%), mother's age was 21-30 years (53.3%). Both fathers and mothers have low education (54.49%, 56.87%, respectively). Majority of the father work as farmers (56.21%), while the mothers do not work (78.43%). There was no important relationship between parental characteristics and underweight. (Table 3).

Table 2: Characteristics of parents of toddler.

Variable	n	%
Father's age (years)		
20	7	2.3
21-30	127	41.5
31- 40	126	41.2
41-50	38	12.4
51-60	8	2.6
Mother's age (years)		
20	40	13.1
21-30	163	53.3
31- 40	93	30.4
41-50	10	3.3
Father's education		
Never school	2	0.65
Did not finish Elementary School	3	0.98
Graduated Primary School	75	24.51
Graduated from Secondary school/equivalent	87	28.43
Graduated from Tertiary school/ equivalent	99	32.35
Graduated Diploma	12	3.92
Graduated University	28	9.15
Mother's Education		
Never school	3	0.98
Did not finish Elementary School	7	2.29
Graduated Primary School	104	33.99
Graduated from Secondary School/equivalent	60	19.61
Graduated from Tertiary school/equivalent	100	32.68
Graduated Diploma	4	1.31
Graduated University	28	9.15
Father's occupation		
Farmer	172	56.21
Cultivator	4	1.31
Merchant/seller	4	1.31
Day laborer	19	6.21
Civil servant/SCA	4	1.31
Private employees	25	8.17
Driver	6	1.96
Fisherman	9	2.94
Craftsman	4	1.31
Entrepreneur	35	11.44
Other	19	6.21
Does not work	5	1.63
Mother's employment status		
No	240	78.43
Yes	66	21.57
Family income		
Under 1 million	131	42.81
1-2 million	102	33.33
2.1-3 million	30	9.80
3.1-5 million	30	9.80
Over 5 million	13	4.25

Discussion

In this study, the subjects are toddlers aged 12–59 months. They came from families where 59% of the mothers had an education level of junior high school or below and where 76.1% of mothers were housewives. 81.4% of families had an income of <2 million/month, and the incidence of morbidity in children under five was 37%. The variables were found to be unrelated because the results had a p value of > 0.05 . However, there was some tendency for child morbidity to occur alongside wasting ($p = 0.143$), and related to the gender of the child, $p < 0.148$. In general, the average intake of energy was 43% of RDA, with specific intakes as follows: carbohydrates = 38.5% RDA, protein = 106% RDA, and fat = 38.4% RDA. The micronutrients were still low.

Based on research studies conducted in Cambodia in an effort to reduce malnutrition with modeling exercises to prioritize multisectoral interventions, the determinants of malnutrition include various biological, social, cultural, economic and morbidity factors, and other variables that show an influence on the incidence of nutritional problems.¹⁴ The other factors are household food security, income level, immunization status and exclusive breastfeeding, food intake, and infectious diseases.¹⁵

The prevalence of malnutrition significantly affects developing countries due to various social, ecological and financial hazard influences.¹⁶ Sex and open defecation among children contribute to malnutrition rates in South Asian countries, including India, compared to high-income African countries.¹⁷ Another study stated that maternal education, body mass index, and economy were related to wasting and being underweight.¹⁸

Chronic malnutrition is the most dangerous common cause of toddler nutrition problems in developing countries; for example, nearly 50% of deaths in children below five ages were caused by malnutrition in Myanmar.¹⁹ Also, in Bangladesh in 2007,²⁰ 43% of children under the age of five experienced nutritional problems, and the number is 24% higher in villages compared with urban areas.

Malnutrition in toddlers has economic consequences. In Indonesia, wasting in toddlers in 2013 cost the government Rp 1.042 billion–Rp 4.687 billion or 0.01%–0.06% of its total gross domestic product. Economic losses are caused by low productivity due to waste problems, thus indirectly causing economic problems for the government.²¹

Our data shows that there was no momentous bond between the variables of parental education, income, child gender, morbidity in the children under five included in our sample. The small sample size, limited data access, and challenges at the study site are the causes of the absence of a significant relationship between the variables as well as being inhibiting factors during the study.

Conclusion

The subjects in this study generally had low education, were low and did not work, the incidence in children was 36.7%, WAZ SD category -2 was 22%, and WHZ was 4.1%. This is relatively high, indicating that the problem still requires full attention to improve children's health. The interventions carried out provide education and nutrition assistance, cooperation with various sectors progress the health position of the public. There is a need for health intervention programs by various parties, cross-sectoral policies, malnutrition can be suppressed through a national improvement mission.

Table 3: Underweight prevalence in children old 12-59 Months.

Independent Variable	Weight for age z score (WAZ)				p-value
	<-2 SD (underweight)		-2 SD (normal)		
	n	%	n	%	
Mother's education					
Low (junior high school and below)	29	26.1	82	73.9	0.187
Height (high school and above)	14	17.9	64	82.1	
Family income					
Low (<2m)	38	24.7	116	75.3	0.186
High (>2m)	5	14.3	30	85.7	
Working Mom					
Not	35	24.3	109	75.7	0.362
Yes	8	17.8	37	82.2	
Gender					
Man	24	24.5	74	75.5	0.148
woman	19	20.9	72	79.1	
Birth weight					
<2500 (LBW)	5	21.3	11	68.8	0.337
2500 (BBLN)	34	20.9	129	79.1	
MP-ASI quality					
Not enough	28	27.5	74	72.5	0.104
enough	15	17.4	71	82.6	
Morbidity					
Sick (last 2 weeks)	20	28.6	50	71.4	0.143
Painless	23	19.3	96	80.7	

What do you know about the matter?

In this study, the age of the father was 21-30 (41.5%), the education of the father was 99 (32.35%), the education of the mother from elementary school was 104 (33.99%), the employment status of the mother was 240 (78.43%), the occupation of the peasant father was 172 (56.21%).

What does the study performed add to the literature?

The intervention consisted of additional food supplies in the form of pumpkin seed cookies in collaboration with various sectors to improve the health conditions of the community.

What are the implications of the results obtained?

Education environmental hygiene and nutrient intake to prevent malnutrition. The need for health intervention programs by various parties, cross-sectoral policies through national improvement missions.

Author Contributions

All authors contributed equally to this article, and A. Fandir conducted this study. In addition, V. Hadju contributed significantly to the setting of this article, while A. Syam and V. Hadju participated in the review and provided recommendations before data were obtained in the field. M.I. Ghazian as one of the teams from JOB Tomori that contributes to both providing transportation and communication with related parties. All of the authors contributed to preparing, drafting and revising the manuscript, giving final approval of the published version and agreeing to be responsible for all aspects of the work.

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Ethics: There is no ethical violation as it is based on voluntary anonymous interviews

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