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ANALYSIS OF UNDERNOURISHED IN CHILDREN AGED 6-24 MONTHS IN BUTON NORTH DISTRICT: CROSS-SECTIONAL STUDY

Wa Ode Salma[1]*, Adibin [2], Mirnawati [3]
[1]Department of Nutrition Science, Faculty of Public Health, Halu Oleo University Southeast Sulawesi, Indonesia
[2]Department of Public Nutrition, Occupational Health and Sports Health, North Buton District Health Office
[3]Department of Family Welfare and Resilience, Department of Population Control and Family Planning, North Buton Regency

Article Info

*Corresponding Author
E-mail: salmawaode849@gmail.com

Abstract

Nutritional status is one of the indicators of children's health. The five-year period (toddler age) is important because children need adequate nutrition to support their physical growth. This study aims to analyze the factors related to the nutritional status of children aged 6-24 months in the working area of the Health Office of North Buton Regency. This cross-sectional study was conducted in the working area of the North Buton District Health Office from June-July 2022, involving 105 children and mothers. The research data were analyzed using the chi-square test. The results showed that the nutritional status of the majority was good, as many as 75 children (71.4%), followed by the Poor category, as many as 30 children (28.6%). Nutritional status related to food intake (P-value < 0.000), history of exclusive breastfeeding (P-value < 0.000), and history of infectious diseases (P-value < 0.000). The study concludes that poor nutritional status will have an impact on the quality of under-fives, and malnutrition can be prevented by a good mother's understanding of nutrition, families can provide nutritious food, infants being exclusively breastfed until the age of 6 months, parenting are oriented towards growth and development of babies under two.

Keywords
Baby under two, undernourished, 6-24 months

1. Introduction

The problem of nutrition in population development is still a problem that is considered to be the main problem in the world population order. Globally, 149.2 million children under five years of age suffered from nutritional problems in 2020 and are still the cause of one-third of all causes of child mortality worldwide (World Health Organization, 2020). South Asia is the region with the most extensive prevalence of malnutrition in the world, which is 46%, followed by sub-Saharan Africa at 28%, Latin America at 7%, and the lowest is in Central, Eastern Europe, and Common Wealth of Independent States (CEE/CIS) by 5%. UNICEF reports that as many as 167 million preschool children worldwide suffer from being underweight, mainly in South Asia (Dipasquale *et al.*, 2020; Li *et al.*, 2020; Odjidja *et al*., 2020).

Furthermore, the 2019 UNICEF report states that the prevalence of under-fives aged 0-59 months experiencing malnutrition or malnutrition in South Asia is 52%, Central Asia is 5%, and Asia Pacific/East Asia is 15% (UNICEF, 2019). A study on the prevalence of malnutrition in Southeast Asia found that in Cambodia, 3.27%, Laos 2.22%, Myanmar 1.56%, Thailand 1.10%, East Leste 5.30%, and Vietnam 1.05% (Mutunga et al., 2020). In line with previous literature review, micronutrient deficiency in Southeast Asia, more than 30% of children under the age of 5 years have zinc deficiency, while thiamine deficiency in children is endemic in Cambodia, Laos, Thailand, and Myanmar (Wieringa *et al.*, 2019). In Indonesia, based on the results of the Basic Health Research (BHR) in 2018, it is stated that the percentage of malnutrition in children aged 0-23 months (baby under two) in Indonesia is 4.5%, while the percentage of malnutrition is 7.2%. For toddlers aged 0-59 months, malnutrition is 3.5%, while the percentage of stunting is 6.7% (Kementerian Kesehatan RI, 2018). Based on MNS (Monitoring of Nutritional Status) in 2017, the malnutrition rate was 11.7%, the malnutrition rate in toddlers based on BB/U (Weight Compared to Age) was 220 toddlers, in 2018 decreased to 204 toddlers, and in 2019 increased to 271 toddlers until 2020 increased very significantly to 471 children under five (Dinas Kesehatan Provinsi Sulawesi Tenggara, 2020). In North Buton Regency in 2020, the prevalence of malnutrition was 223 cases or 29.83%, malnutrition in the last three years was relatively high and experienced stability, namely 100 under-fives in 2011, 157 in 2012, and 22 under-fives in 2020 (Dinkes Kabupaten Butur, 2021). Direct and indirect factors influence malnutrition in toddlers. Direct factors that affect under-five malnutrition are infectious diseases and the food intake of toddlers. In contrast, indirect factors include education, knowledge, family skills, and food security related to the family's ability to meet the food needs of all family members in sufficient quantities, both in number and quantity. Nutrition and utilization of health services and environmental sanitation, with the primary causes of economic structure or conditions (Merryana Adriani, 2016; Novitasari A & Puruhita, 2012; Oktavia *et al.*, 2017; Saputra, 2012). In addition, the results of research

conducted by (Gandini *et al.*, 2017) through a correlation test showed a positive and significant relationship between mothers' work and the nutritional status of children under five. Other sources say that low education can affect the availability of food in the family, which in turn affects the quantity and quality of food consumption which is a direct cause of malnutrition in children under five (Wahyudi *et al.*, 2014). Breastfeeding and completeness of immunization also have a significant relationship with malnutrition because breastfeeding and immunization provide immune substances to toddlers so that the toddler becomes less susceptible to disease. Healthy toddlers will not lose their appetite, so their nutritional status remains good (Alamsyah *et al.*, 2015, 2017).

Undernutrition conditions that are not addressed will cause adverse effects for children under five, such as growth retardation, including stunting growth, reduced body resistance which is closely related to susceptibility to infectious diseases, low level of intelligence, decreased physical abilities, impaired physical and mental growth, stunting, blindness, and death in young children. For this reason, we analyzed the factors associated with the incidence of malnutrition in infants less than two years old aged 6-24 months in North Buton Regency.

2. Methods

This cross-sectional study was carried out in 10 Health Centers of the North Buton District Health Office in June-July 2022, involving 105 children and mothers who were randomly selected, with sample inclusion criteria such as having children aged 6-24 months, having a KIA book, domiciled in Buton Regency. Mothers of infants under two years of age who were unwell at the time of the study were excluded. The research variables included nutritional status, food intake, history of exclusive breastfeeding, and history of suffering from infectious diseases. Collecting data for each variable using a questionnaire. Nutritional status was measured using anthropometry including BW/U index with the z-score method with criteria for good nutrition = z-score -2 SD to < 2 SD, and undernutrition = z-score >-3 SD s/d <-2 SD. Food intake is the number of nutrients toddlers consume in the form of adequate energy and protein, measured using a 2x24 hour recall form. The history of exclusive breastfeeding is the mother's behaviour in giving only breast milk from the time the baby is born until the baby is six months old without being given other food or drink except; drugs and vitamins. Assessed using a Guttman scale questionnaire with a score range of 0-1 (score 0 if the answer is no and score one if the answer is yes) with a total of 10 items. A history of infectious disease is a child with an infectious disease, namely ARI or diarrhea, more than three times in the last month. Data are presented as numbers and percentages for categorical variables. Continuous data were expressed as mean ± standard deviation (SD) or median with Interquartile Range (IQR). Data analysis using the chi-square test: if the P-value < 0.000 is considered significant, use the SPSS version 16.0 application.

3. Results

Table 1: Characteristics of the baby under two

Characteristics	n	%
Age		
6-11	20	19,4
12-24	85	80,6
Gender		
Male	60	57,1
Female	45	42,9

Table 1 show that the age group of the most dominant respondents was 12-24 months with 85 respondents (80.6%), followed by the age group of 6-11 months with 20 respondents (19.4%). Then the sex of the majority of males was as many as 60 respondents (57.1%), followed by females, as many as 45 respondents (42.9%).

Table 2: Mothers characteristics

Characteristics	n	%
Age		
20-26	29	27,6
27-33	21	20,0
34-41	55	52,4
Education level		
Basic	39	37,1
Junior school	25	23,8
High school	25	23,8
College	16	15,3
Employment		
Government staff	7	6,7
Farmer	52	49,5
Housewive	26	24,8
Entrepreneur	20	19,0

Table 2 shows that the majority age is 34-41 years, with as many as 55 respondents (52.4%), followed by 20-36 years, as many as 29 respondents (27.6%) and the lowest age range is 27-33 years with 21 respondents (20%). The most dominant education level of respondents was an elementary school with 39 respondents (37.1%), followed by junior and senior high

school with 25 respondents (23.8%), and tertiary education with 16 respondents (15.3%). The most dominant type of occupation of the respondents is farmers, with as many as 52 respondents (49.5%), followed by homemakers, as many as 26 respondents (24.8%), entrepreneurs, and as many as 20 respondents (19.0%). The least is civil servants, with as many as seven respondents (6.7%).

Table 3: Distribution of study variables

Variables	n	%	P-value
Nutritional status			
Good	75	71,4	
Poor	30	28,6	
Food supply			0,000
Good	55	52,4	
Fair	26	24,8	
Poor	24	22,9	
History of Exclusive Breastfeeding			0,000
Good	69	65,7	
Poor	36	34,3	
History of Infectious Diseases			0,000
Good	73	69,3	
Poor	32	30,5	

Table 3 shows that the nutritional status of the majority is good, with as many as 75 children (71.4%), following the less category, as many as 30 children (28.6%). The majority of food intake was good, as many as 55 children (52.4%), followed by the Fair category, as many as 26 children (24.8), and the Poor category, as many as 24 children (22.9%). ,7%), following the poor category with 36 respondents (34.3%). The majority of infectious disease history was in a Good category as many as 73 respondents (69.3%), followed by the less category as many as 32 respondents (30.5%). The relationship between variables using the chi-square test showed that nutritional status was related to food intake (energy protein) (P-value < 0.000), history of exclusive breastfeeding (P-value < 0.000), and history of infectious diseases (P-value < 0.000).

4. Discussion

4.1. Food supply

Food intake (energy and protein) is related to the nutritional status of toddlers. For toddlers whose nutritional status is normal, most of them have adequate food intake. It indicates that food directly affects nutritional status (Damanik *et al.*, 2016). The researcher assumes that toddlers' food intake can be reduced due to several factors, including the respondent's education level, respondent's income, and gender of toddlers; as mentioned above; adequate food intake is more commonly found in respondents with a minimum of high school education, income at least the same as the UMR, and male

toddlers. These factors can affect nutritional status indirectly because these factors affect the food intake of either energy or protein from toddlers, which then affects the nutritional status of the toddlers studied. Nutritional status results from a balance between food that enters the body (nutrition intake) and the body's needs (nutrition output) for these nutrients. Children whose food is not good enough will have a weakened immune system and be susceptible to disease (Damanik *et al*., 2016). Sick children will lose weight, which will affect the child's nutritional status (Nurcahyo & Briawan, 2017).

The results showed that in children with good food intake, there is a tendency to have good nutritional status and vice versa; children with limited or less protein energy intake tend to have less nutritional status toddler (BB/U). This study is in line with research that states a relationship exists between energy intake and the nutritional status of children under five (Handono, 2017). Research data shows that toddlers with less energy intake mostly have normal nutritional status. The chi-square test results obtained a p-value of 0.000 <0.05, meaning that there is a relationship between food intake (protein calories) and the nutritional status of children under the age of five in the Work Area of the Health Office of North Buton Regency. The work of the Bungangan Health Center in Semarang City shows that the higher the intake of energy and protein, the better the nutritional status of children under five (Rarastiti & Syauqy, 2017). The lower the protein intake of toddlers, the lower their nutritional status. Protein has a role in the growth and maintenance of tissues, the formation of body compounds, the regulation of water balance in the body, the formation of antibodies, and the transport of nutrients (Muchtadi, 2016).

4.2. History of exclusive breastfeeding

The results showed that the history of exclusive breastfeeding was mainly in the Good category as many as 69 respondents (65.7%), followed by the less category as many as 36 respondents (34.3%). There are still many of them who suffer from malnutrition and even worse. Deterioration in child nutrition can occur due to various factors, such as the nutritional status of the mother during pregnancy or the mother who is very close to pregnancy; it can also occur due to the mother's ignorance of how breastfeeding is given to her child, the lack of understanding and knowledge of the mother about the benefits of breastfeeding and breastfeeding makes it easy for mothers to give birth. Affected and switch to bottle feeding (formula milk). Breast milk is food that is hygienic, cheap, easy to give, and readily available for babies. Breast milk is the only food babies need for the first six months of their lives to become healthy. Optimal for babies. Breast milk and plasma have the same ion concentration, so babies do not need additional fluids or food (Giri, 2013). Breast milk has all the elements that meet the baby's nutritional needs for about six months unless the mother suffers from severe malnutrition or other health problems. The composition of breast milk

will change in line with the baby's needs (Yustianingrum & Adriani, 2017). Breast milk is superior to other foods for babies, such as formula milk, because the protein content in breast milk is lower than in cow's milk, so it does not burden the kidneys, and the type of protein is easy to digest. In addition, breast milk contains fat in the form of essential amino acids, saturated fatty acids, medium-chain triglycerides, and cholesterol in sufficient quantities for infants (Brown *et al*, 2015). The chi-square test results obtained a p-value of 0.000 <0.05, meaning that there is a relationship between a history of exclusive breastfeeding and the nutritional status of children under two in the Health Office of North Buton Regency. In line with Pertiwi's research in 2016, in his research "The Correlation of Mother's Characteristics with Exclusive Breastfeeding with infectious diseases and nutritional status in infants carried out in Semarang", it was found that there was a relationship between age, occupation, previous breastfeeding experience and mother's education level with the nutritional status of toddlers. A relationship with a statistical significance of p=0.017 was found in testing the hypothesis that there was a relationship between the duration of exclusive breastfeeding and the nutritional status of children under five. The results of this study are also in line with research conducted by Nilakesuma *et al.,* (2015), which showed that there was a relationship between exclusive breastfeeding and nutritional status, meaning that children aged 6-24 months who did not receive exclusive breastfeeding had the same opportunity to suffer from malnutrition.

4.3. History of infectious disease

The table shows that most infectious disease history is in the Good category, with as many as 73 respondents (69.3%), followed by the less category as many as 32 respondents (30.5%). Infectious diseases can cause decreased appetite and limitations in consuming food. Toddlers affected by infections tend to lose weight due to an increase in metabolism in the toddler's body and usually followed by a decrease in appetite. Straight weight loss can cause a decrease in nutritional status to cause nutritional disorders.

Toddlers are at a vulnerable age to suffer from an infection. It is because the immune system is immature. Infectious diseases that attack toddlers can interfere with the absorption of nutritional intake, thus encouraging malnutrition and malnutrition. Nutrients into the body. Infectious diseases can interfere with metabolism, creating hormonal imbalances and interfering with immune function. Malnutrition and infectious diseases have a reciprocal relationship, where infection exacerbates nutritional problems and nutritional disorders worsen children's ability to cope with infectious diseases. Infectious diseases that affect nutritional status in toddlers are diarrhea, fever accompanied by flu and cough, bronchitis, intestinal worms, measles, and Singapore flu; there are also congenital diseases suffered by toddlers, including heart disorders and congenital abnormalities and mental disorders

(Putri *et al.*, 2015). Infectious diseases that attack children cause poor nutrition. Several things worsen the nutritional status of children due to infectious diseases, including decreased appetite; diarrhea and vomiting that cause sufferers to lose fluids and some nutrients and fever. Effective ways to prevent the spread of this disease can be in the form of physical, mechanical or chemical efforts, which include hand washing, use of gloves, use of liquids, processing of used equipment, and waste disposal. The chi-square test results obtained a p-value of 0.000 <0.05, meaning that there is a relationship between a history of infectious diseases and the nutritional status of children under two in the Health Office of North Buton Regency. It is in line with Hadiana & Ardiyanto research (2013) which states that children who suffer from infectious diseases will experience impaired appetite and absorption of nutrients, causing malnutrition. The results also showed that 15 children under five had experienced the disease but did not experience nutritional status problems (22.1%). It is in line with Jayani's research (2015) which states that nutritional status is influenced by several factors, namely knowledge, perception, habits or taboos, preferences for certain types of food, socioeconomic, and infectious diseases. It means that the history of infectious diseases suffered by children under five is not a single factor that affects nutritional status.

5. Conclusion

Preventing undernourished status can be done by increasing the mother's knowledge about nutrition, increasing family income so that it can provide the food needed, and breastfeeding until toddlers six months, avoiding infectious diseases and good parenting. Health workers should more often provide counselling to mothers who have toddlers to provide good parenting to support the growth and development of children. Maternal behavior in intensive nutrition needs to be monitored to minimize the incidence of nutritional disorders.

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