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Nutritional Status of Children Age 4-6 Years Old in Local Village

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Abstract: Malnutrition is the primary cause of morbidity and mortality in children. The term of malnutrition includes a state of undernutrition and overnutrition, that is caused by consumption of food that is lacking, poor absorption, or excessive loss of nutrients. To assess the nutritional status of children age 4-6 years old in local village, Bali. This research was a cross-sectional descriptive study with 60 subject which were kindergarten students in Bali and with 60 respondents which were the mother of the subjects. The data collecting technique of this research was purposive sampling, with using questionnaire for respondents and direct measurement for the subjects. Most of the respondents were in normal category based on anthropometry index. We also found the prevalence of over nutrition were higher than undernutrition. Undernutrition status was found more in children with less nutrient intake, normal nutrition status was found more in children with good nutrition intake, while over nutrition status was more dominant in children with high nutrition intake. Most of research subjects which are children age 4-6 years old in local village Bali are on normal category of nutritional status. This result are expected to be a basis in anticipation of further research and for making public health programs.

Keywords: Age 4-6 years old; Children; Nutritional Status

Introduction

Malnutrition is a medical condition that is caused by improper or insufficient feeding (Alamy & Bengelloun, 2012; Scholes, 2022). Malnutrition usually more associated with the condition of undernutrition (lack of nutrition), that is caused by consumption of food that is lacking, poor absorption, or excessive loss of nutrients. But the term malnutrition also includes a state of overnutrition (Arifin et al., 2022; Huse et al., 2022). A person will experience malnutrition if the amount, type, or adequate quality of nutrients which includes a healthy diet is not consumed for a certain period of time (Fanzo, 2015; de Pinho et al., 2019; Sanders et al., 2019).

This condition of malnutrition is still the primary cause of child morbidity and mortality in developing countries (Abate et al., 2019; Lakonawa et al., 2020). This is a major health problem and it is the cause of half of child deaths that occur in the world. Based on data from WHO 2012, the prevalence of malnutrition (undernutrition) in children under the age of five years from 2005-2011 in the world is still relatively high at 16.2%. The high level of malnutrition in children is a major challenge for child survival and development. Its prevalence increases not only in developed countries but also in developing countries (Dukhi, 2020; Mahmudiono et al., 2019). In addition to malnutrition, it is estimated that around 40 million (6%) children 4-6 years have more nutrition with weight for height exceeding two standard deviations from the median value of standard child growth from WHO (Andini et al., 2022; Pal et al., 2020).

In Indonesia, nutritional problems are still the main public health problem (Mediani, 2020). Based on data from Riset Kesehatan Dasar 2013, the prevalence of children aged 4-6 years who experience malnutrition nationally is 4.9%, under nutrition is 13%, and over nutrition is 5.8%. When compared with the nutritional status of children aged 4-6 years in Bali, Bali tends to be better, it can be seen from the data on the prevalence of nutritional status, such as malnutrition 1.7%,

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malnutrition 9.2% and over nutrition 8%. Based on height compared to age, around 14% of children aged 4-6 years in Bali are still classified as very short and 15.3% short. While based on body weight compared to height, around 5.2% of children aged 4-6 years in the Bali area were classified as very thin, 7.9% thin and 17.5% classified as overweight. Although from the data it was found that the incidence of malnutrition and undernutrition in the province of Bali was lower than other provinces (Rosmanah et al., 2020; Pitoyo et al., 2020), but over nutrition cases were things that is need to get special attention (Kementerian Kesehatan Republik Indonesia, 2013).

Ages 4-6 years are the beginning of the introduction of children with a social environment in the general public outside the family (Balantekin et al., 2020; Davenport & Holt, 2019). A child aged 4-6 years is experiencing a relatively rapid growth period. At this time, the process of physical, emotional and social changes in children takes place quickly (Aryastuti et al., 2020). This process is influenced by various factors from the child's own self and environment. In terms of food consumption, there will be a transition from the age of passive consumers to be active consumers so that in this age, children are very vulnerable to various health problems, especially nutritional problems (Hien & Kam, 2008; Scaglioni et al., 2018). The aim of this study is to describe the characteristics of children aged 4-6 years and their mothers, to find out nutritional intake for children age 4-6 years, and to know nutritional status of children aged 4-6 years in local village, Bali.

Method

This research was a cross sectional descriptive study. This study was conducted to obtain an overview of nutritional status in residents aged 4-6 years. The study was conducted in Beraban Village, Kediri District, Tabanan. The population in this study were all children aged 4-6 years in Beraban Village, Kediri District, Tabanan. The sample size was calculated using the cross sectional study sample formula with estimated proportion was 0.24 which is obtained from the data of Riset Kesehatan Dasar in 2013, namely the number of children aged 4-6 years in Indonesia who are at risk of malnutrition. From the calculation obtained the minimum number of samples needed for this study were 57 children aged 4-6 years. Sampling was done purposively, it was in a Kindergarten of Beraban Village with 103 students were included as sampling frame.

The inclusion criteria in this study were registered as students at Kindergarten of Beraban, residing in Kediri, Tabanan, and willing to be the subject of research. Uncooperative and absent during the data collection were excluded from this study. Respondents in this study were mothers of children who were the subjects of research who daily cared and knew the child's condition well.

The variables in this study included nutritional status which was defined as the state of child nutrition determined by the anthropometric size according to Centers for Disease Control and Prevention (CDC), namely the ratio between body weight with age (BW-Age), height with age (H-A), and weight with height (BW-H); children's characteristics, including the age of the child, sex of the child, birth weight of the child, birth order, number of siblings, health status of the child, history of exclusive breastfeeding; maternal characteristics, including maternal age at delivery, mother's BMI, maternal education level, maternal occupation, family income, and nutritional intake which was calculated by recording the number and type of food consumed by children in the last 24 hours (24hours food recall) with household units such as rice spoons, tablespoons, small, medium, large pieces for vegetables, and for liquids calculated per glass and then, we converted them into carbohydrates, proteins, and fats in units of calories by using the 2004 Cipto Mangunkusumo Hospital Food Exchange List. Daily carbohydrate intake is classified as low (<45% of total daily calories), sufficient (45% -60% of total daily calories), high (> 60% of total daily calories). Daily fat intake is classified as low (<25% of total calories), sufficient (25% -35% of total daily calories), high (> 35% of total daily calories). Daily protein intake is classified as low (<10% of total daily calories), sufficient (10% -30% of total daily calories)), high (> 30% of total daily calories) (RSUP Dr. Cipto Mangunkusumo, 2004).

After collecting data, we continued by doing data entry. We did data transformation by recoding the variables of child birth weight, physical activity (sleep duration, duration in front of the screen, duration of playing inside and outside the home, duration of study), mother's age, mother's work, and family income. For Body Mass Index (BMI) variable, the data of maternal body weight and maternal height were transformed through questionnaires using the compute facility at SPSS. Data is then presented in a table model so that it is easy to read. For univariate data on child characteristics, maternal characteristics, nutritional intake, and nutritional status, frequency analysis was carried out, then cross tabulations were performed on variables of nutritional status and nutrient intake.

Result and Discussion

Results

From 103 students, we got 60 students who met the criteria for our study sample. Table 1 outlines the characteristics of the children including the age, sex, birth weight, birth order, number of siblings, health status, and history of exclusive breastfeeding. Maternal characteristics can be seen in Table 2.

Table 1. Children Characteristics

Children Characteristics	Frequency (n=60)	Percentage (%)
Sex		
-Male	30	50
-Female	30	50
Age		
- 4 years old	8	13.3
- 5 years old	42	70.0
- 6 years old	10	16.7
Birth Weight		
- Low	1	1.7
- Normal	58	96.7
- High	1	1.7
Birth Order		
- First Born	24	40.0
- Middle Born	7	11.7
- Last Born	29	48.3
Number of Siblings		
- <2	46	76.7
- ≥2	24	23.3
Health Status		
History of Illness		
-Diarrhea	7	11.7
-Upper Respiratory	47	78.3
Tract Infection	2	3.4
-Other		
History of		
Vaccination	59	98.3
-Complete	1	1.7
-Uncomplete		
History of Exclusive		
Breastfeeding	24	40
-Yes	36	60
-No		

Table 2. Maternal Characteristics

Characteristics	Frequency (n=60)	Percentage (%)
Mother age when giving		
birth	20	33.3
- <25 y.o	38	63.3
- 25-35 y.o	2	3.3
- >35 y.o		
Mother's BMI		
- underweight	7	11.7
- normal	20	33.3
- overweight	33	55.0
Mother's education		
- Elementary school	9	15
- Junior High school	14	23.3
- Senior High School	28	46.7
- Bachelor's Degree	9	15
Mother's occupation		
- working	30	50
- not working	30	50
Family Income		
- Less than regional	24	40
minimum wage (RMW)		
- More than RMW	36	60

From Table 3, we can see the result of daily nutritional intake and the macronutrient component that are calculated with the 24 Food Recall Questionnaire. Based on table 4, it was found that most of the nutritional status of children in this research were in the normal category based on body weight versus age (60.0%), height compared to age (81.7%), and body weight is high (61.7%). In addition, it was also found that there was a tendency for over nutritional events to occur than poor nutritional, according to body weight versus height, weight compared to age and weight compared to height. Cross tabulation showed that children with high nutritional intake are prone to be over nutrition.

Table 3. Daily Nutrient Intake and Macronutrient Components

Variable	Frequency (n=60)	Percentage (%)
Daily Nutritional		
Intake		
- Low	41	68.3
- Normal	17	28.3
- High	2	3.4
Carbohydrate		
Intake		
- Low	28	46.7
- Normal	28	46.7
- High	4	6.7
Fat Intake		
- Low	24	40.0
- Normal	36	60.0
Protein Intake		
- Low	32	53.3
- Normal	25	41.7
- High	3	5.0

Table 4. Cross tabulation between nutritional status and daily nutritional intake

Nutritional Status	Daily Nutritional Intake					
	Low		Normal		High	
	N	%	n	%		%
Body Weight-Age						
- thin	6	14.6	0	0.0	0	0.0
- Normal	34	82.9	3	17.6	0	0.0
- fat	1	2.4	14	82.4	2	100.0
Height-Age						
- Short	1	2.4	0	0.0	0	0.0
- Normal	37	90.2	10	58.8	1	50.0
- High	3	7.3	7	41.2	1	50.0
Body Weight – Height						
- Under weight	11	26.8	0	0.0	0	0.0
- Normal	29	70.7	7	41.2	0	0.0
- Over weight	1	2.4	10	58.8	2	100.0

Discussion

The purpose of this study was to determine the nutritional status of children aged 4-6 years in the village of Beraban, Bali. Based on daily nutritional intake, the number of children aged 4-6 years who have less nutritional intake (68.3%) are more than those who have adequate daily nutrition and more. The pattern of less

nutrient intake is influenced by many factors, such as gender, age of the child, physical activity of the child, education level of the mother, mother's work, and family income (Andini et al., 2022; Scaglioni et al., 2018). In addition, children's nutritional intake is influenced by the eating habits of children who tend to be picky and prefer to choose snacks (Scaglioni et al., 2018).

The need for a daily carbohydrate intake of 45-65% (RSUP Dr. Cipto Mangunkusumo, 2004), children aged 4-6 years who have a low daily carbohydrate intake as many as those who have a sufficient daily carbohydrate intake (46.7%). Based on daily protein intake in children aged 4-6 years, the number of children who have sufficient protein intake which is around 10 - 30% of daily nutritional intake (RSUP Dr. Cipto Mangunkusumo, 2004) are 60.0% and there is no subject who have high daily protein intake. This is because children aged 4-6 years rarely consume nuts, meat, and consume more snacks (Kostecka et al., 2021). Daily fat intake in children aged 4-6 years is around 25-35% (RSUP Dr. Cipto Mangunkusumo, 2004). In this study most children had low daily fat intake. This is likely related to the economic status of the family, where 40% of the population has an income below the RMW of the Tabanan district, so that the purchasing power of meat which is one of the main sources of fat consumed by children is low.

Most of the nutritional status of children in this research were in the normal category based on body weight versus age (60.0%), height compared to age. (81.7%), and body weight per height (61.7%). Comparing with data from Riset Kesehatan Dasar 2013, most children under five years old in Bali have normal nutritional status based on body weight per age (81.0%), height compared to age (70.7%) and body weight compared to height (69, 4%). Whereas based on body weight compared to height, it was found that the proportion of over nutrition in Bali was higher than that of undernutrition (Kementerian Kesehatan Republik Indonesia, 2013). This weight index compared to height is an index to identify current nutritional status. Until now, Indonesia still faces the burden of community nutritional issues, same like other developing countries. On one hand Indonesia still face the problem of undernutrition and even severe malnutrition, but on the other hand we also face problems related to 'excess nutrition' (over nutrition), being overweight, and even obesity.

This fact becomes important to be noted because obesity has an impact on child development (Sahoo et al., 2015), especially for organic and psychosocial aspects. Children with obesity have a high risk of becoming obese in adulthood and could lead to some diseases, including cardiovascular disease and diabetes mellitus (Pemayun et al., 2022). They can also lead to metabolic disorders, such as atherogenesis, insulin resistance, thrombogenesis disorders, and carcinogenesis. Some experts suggest efforts to prevent obesity to be begun in early childhood. Preschool age period is important in human development (Cahyawati & Permatananda, 2022). This is because at this time the occurrence of brain development and intelligence will affect in adulthood. In addition, childhood is also a vulnerable period, because at this time if a child lacks nutritious food, it will be very easy to suffer from diseases and other health problems (Govender et al., 2021; Khan et al., 2017).

Over nutrition events are tend to occur than undernutrition that can be caused by some factors, such as daily nutrient intake, physical activities of the subject, as well as the maternal characteristics of the subject, and subject's themselves (Dewvi et al., 2020; Scaglioni et al., 2018). Although there is a tendency for over nutrients to be found more than undernutrition, the problem of undernutrition does not mean that it can be ignored. Therefore, the role of various parties is needed to overcome this problem of malnutrition.

Conclusion

Most of the subjects were in normal category based on anthropometry index. We also found that the prevalence of over nutrition was higher than undernutrition. Undernutrition status was found more in children with less nutrient intake, normal nutrition status was found more in children with good nutrition intake, while over nutrition status was more dominant in children with high nutrition intake.

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