

# Nutritional status of children in Bali-Indonesia

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**Abstract.** Nutrition issues are the most important and of special concern since the fetus to the elderly. One such problem is malnutrition in children. Poor nutrition status can affect the growth and development of children. This research aims at determining the nutritional status in children aged 6-12 years. The design of this research is descriptive with cross-sectional method. The sample is all children in elementary school in Tulikup Village comprising 81 children. Nutrition status in children is measured based on body mass index. The collected data is then analyzed descriptively. It is found that most of the girls had underweight. In terms of age, most children aged 7 and 9 years suffering from underweight.

## 1. Introduction

Nutritional problems in children is one of the important problems and get special attention. This nutritional problem can be underweight and overweight or obesity. Underweight and malnutrition in children can be caused by lack of food intake, poverty, low education mothers, and others. This situation requires special attention, because it can affect the growth and development of a child. Asia and Oceania occupy the highest prevalence of underweight cases [1]. Indonesia as part of Asian countries, besides underweight also found overweight problems in children. Based on Global National Report 2014, the prevalence of underweight is 41.9% and overweight of 18.8% in 2013. In addition, Riskesdas 2013 also shows that in Bali Province, the prevalence of underweight is 5.6%, malnutrition 2.3% and overweight 8% in children aged 5-12 years. Research conducted in Blahbatuh Gianyar Bali in kindergarten children found that children who are short and thin as much as 9.4% and obesity as much as 24.4% [2].

Nutrition problems can affect growth and development in children. In the conditions of poor nutrition or malnutrition, children may experience impairment in motor, sensory, cognitive, social and emotional development, and susceptible to infection. In overweight or obese situations, children may be exposed to health problems such as metabolic syndrome and less active. Malnutrition is associated with family socioeconomic status and maternal antenatal care [3].

Besides preschool children, it is also important to know the nutritional status of school-aged children. At school age, children need enough nutrition to concentrate on receiving lessons and playing with other children. It is also related to the mental and cognitive development of the child. This research aims to determine the overview of nutritional status in children aged 6-12 years in elementary school in Tulikup Village.



## 2. Material and methods

The design of this research is descriptive with cross-sectional method. The sample is all children in elementary school number 1 in Tulikup Village, Gianyar regency of Bali, which is 81 children. Weight measured using Camry scales and height measured using Gea stature meter. Body mass index is calculated using the following formula:

$$\frac{\text{weight (kg)}}{\text{height (m}^2\text{)}} \quad (1)$$

With the default values below for reference:

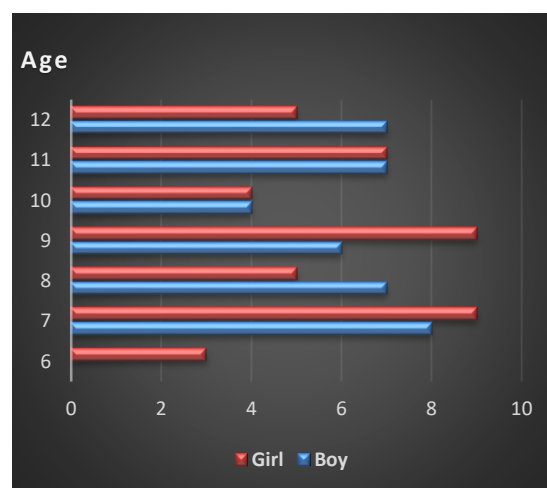
<18.5 = thin/underweight  
 18,5 – 25 = normal  
 25 – 27 = overweight  
 >27 = obesity

## 3. Results and discussion

In this study, most of the samples were 7 years old (21%) and girls (51.9%). These results can be seen in Table 1 and Fig. 1.

**Table 1.** Characteristics of the sample.

Characteristics	Frequency	Percentage
Gender		
Male	39	48,1%
Female	42	51,9%
Age (year)		
6	3	3,7%
7	17	21%
8	12	14,8%
9	15	18,1%
10	8	9,9%
11	14	17,3%
12	12	14,8%



**Figure 1.** Characteristics of the sample.

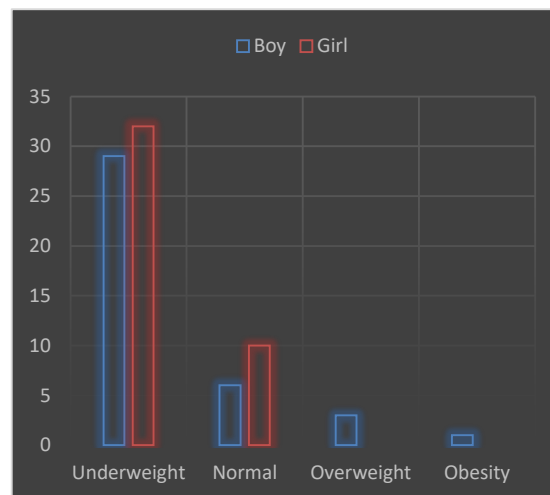
The results also showed that most children had an underweight body mass index (75.3%). Followed by a normal body mass index of 19.8%, overweight as much as 3.7% and obesity as much as 1.2%. These results can be seen in Table 2, Fig. 2 and Fig. 3.

**Table 2.** Body mass index in children.

BMI	Frequency	Percentage
Underweight	61	75,3%
Normal	16	19,8%
Overweight	3	3,7%
Obesity	1	1,2%

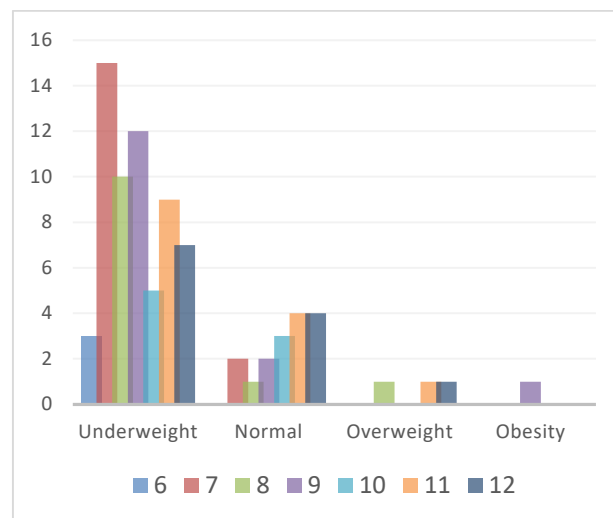
The results of this study are not the same as the research that has been done in America, Brazil, China and Russia, which shows most children have a tendency to overweight [4]. Other studies also show a decrease in underweight prevalence from 2003 to 2006 in children in the United States from 5.3% to 2.7% [5-6] Other studies in Romania also show that most children are overweight or obese [7]. Global research in the world shows a decrease in underweight in children from 1990 to 2015 [8].

In this study most have an underweight body mass index, this is likely associated with Tulikup Village which is a region far from urban areas. The lack of maternal education that has an adverse impact on child nutrition may be related to the underweight of the child in the village. A study conducted on children in Bangladesh shows that parental education, economic and nutritional characteristics, child-feeding practices, and birth-orders are important factors that determine the occurrence of underweight in children [9,10]. Underweight in children is also associated with low birth weight and breastfeeding for 6 months [10,11].



**Figure 2.** Body mass index based on gender.

By gender, underweight is mostly found in girls (Fig. 2). This study is similar to studies conducted in Turkey, that underweight is more common in girls than boys in rural areas [12]. A study conducted in the UK and other countries shows a decrease in the prevalence of underweight in children and this is also related to gender. In younger children, underweight is more common in boys. Other factors associated with underweight are low maternal weight during pregnancy, stress during pregnancy, drinking alcohol during pregnancy, and prematurity [10,13].



**Figure 3.** Body mass index based on the age.

Based on age, underweight is mostly found at age 7 and 9 years. The results of this study contrasted with studies conducted in Romania, that children aged 6 to 11 years are mostly overweight. It can be attributed that the Romanian State is the richest country with a natural source of gold. This causes the population to prosper. Meanwhile, Tulikup Village in Bali Indonesia included as one of Developing Countries [7].

Underweight in children can lead to decreased academic achievement, increased aggressive behaviors, and lower self-esteem. Parents play an important role in diet and exercise patterns in childhood. Parental perceptions of weight gain as a teenager such as underweight and overweight can also affect a child's development [6].

#### 4. Conclusion

Proper nutrition for children is the main thing that should be considered by parents. This is important for the growth and development of children. In this study, most of the girls had underweight. Based on age, most children aged 7 and 9 years suffering from underweight.

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