

Screening of nutritional status and educating balanced nutrition for boarding school students

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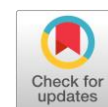
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ABSTRACT

Nutritional status is a condition that reflects the balance between nutrient intake and nutrient needs for body metabolism. Malnutrition is still a priority for national health development. Malnutrition in children causes growth and development problems and affects the quality of resources. The risk of malnutrition can occur to the students at the Islamic boarding school because they do not live and are cared for by their parents. Therefore, this community service focuses on screening and anticipating calorie deficiency in elementary school students. Ash Sholihah Islamic Boarding School is a boarding school in Sleman Regency with simple facilities. The number of boarding school students is approximately 700 male and female students, consisting of elementary to high school students. Elementary school students need more attention because they cannot take care of themselves and maintain food intake properly. The results of the anthropometric examination of 198 children showed that 166 (83.6%) were underweight, 24 (12.1%) had ideal body weight, and 8 (4.04%) were overweight. The results of the anthropometric examination of 198 children showed that 166 (83.6%) were underweight, 24 (12.1%) had ideal body weight, and 8 (4.04%) were overweight. The results of the mini nutritional assessment (MNA) questionnaire screening showed 10 (5.1%) malnutrition, 165 (83.3%) risk of malnutrition, 8 (4%) good nutrition, and 15 (7.6%) unknown. The service activities were continued with medical examinations and administration of drugs if necessary. Then carried out education and provision of additional calories to 166 children underweight. Dormitory administrators are involved in supervising the implementation of additional nutrition. Additional intake given is a preparation equivalent to 100 kcal/day for each child as modified Formula 100.



KEYWORDS

Islamic boarding
School students
Modified Formula-100
Nutrition education
Nutritional status



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1. Introduction

Nutritional status is a condition that reflects the balance between nutrient intake from food and the nutritional needs needed for body metabolism. Nutritional needs are not the same for everyone depending on age, gender, body activity in a day, and body weight [1], [2]. Assessment of nutritional status can be done with several approaches, namely the assessment of nutritional status directly or indirectly. Direct assessment can be carried out through 4 assessments, namely: anthropometric measurements, clinical assessments, biochemical examinations, and biophysical examinations. Indirect assessment of nutritional status can be done in 3 ways, namely: a survey of food consumption, analysis of vital statistical data, and analysis of ecological factors [3].

The Ash-Sholihah Islamic Boarding School (PP) was officially established by K.H. Muhammad Zahid in 1989. This cottage is located in Jonggrangan Hamlet, Sumberadi Village, Mlati District, Sleman Regency, Special Region of Yogyakarta [4]. There are approximately 700 students that stay at PP Ash-Sholihah. The students are all day in the dormitory complex and are required to participate in all designated Madrasah Diniyah activities. The students at PP Ash Solihah are quite diverse, ranging from elementary to high school age. For students from junior high school to high school, they are relatively able to take

care of themselves. However, this is not the case for elementary school-aged students who still depend a lot on others in terms of taking care of themselves and maintaining a healthy food intake. Education about balanced nutrition needs to be given to provide knowledge to the students. Islamic boarding school teachers are also involved in understanding balanced nutrition at every learning opportunity related to health. Education was also delivered to the provision of food in the pesantren. The boarding school has certainly tried to meet the food and nutritional needs of their students. However, the large number of students does not rule out the possibility of students experiencing nutritional problems, especially for elementary school-age students.

2. Method

The method of implementing the service is carried out in several stages as follows:

- Verification of elementary school-age students based on school data
- Anthropometric measurements of students include weighing using a digital scale, measuring height using a microtoise.
- Calculating and grouping of students based on body mass index (BMI).
- Check students' health and provide treatment if needed.
- Education about health and balanced nutrition to students and boarding school administrators, with lecture and answer-and-question method.
- Provide additional calorie intake in the form of modified formula 100 to students with poor nutritional status.
- Monitoring and evaluating the program, so that the objectives can be achieved.

The stages of the implementation are aimed at identifying nutritional problems in students so they can be anticipated early.

3. Results and Discussion

The dedication service was carried out starting in July 2020 until December 2020. The postponement of the implementation was due to waiting for the preparation of materials and the readiness of students at the Islamic boarding school. The results of the observations show that Islamic boarding schools are in the development stage both physically and in the learning curriculum. The existing facilities are quite complete, although simple. The environment of the lodge and its surroundings is quite clean, students play an active role in maintaining cleanliness by providing well-scheduled picket responsibilities.

The learning process in schools is developing well and following the references from the education office and the ministry of religion. The number of teaching staff for elementary schools is still limited to classroom teachers. The religious learning process is carried out before and after the school learning process.



Fig. 1. Ash-Sholihah Islamic Boarding School, Jonggrangan, Sumberadi, Kapanewon Mlati, Sleman Regency

The implementation of the service begins with the verification of student data for each class, followed by health checks and balanced nutrition education. The results of the medical examination showed that there were no health problems that indicated drug distribution.



Fig. 2. Nutrition education for male students



Fig. 3. Nutrition education for female students

The results of anthropometric screening of the elementary school-age students' nutritional status at the Ash Sholihah Islamic boarding school are shown in the following [Table 1](#):

Table 1. The results of the anthropometric screening of elementary school-age students

No.	Student Characteristics	Total	Percentage (%)
1.	Total	198	100
2.	Gender	111	56.1
		87	43.9
3.	Class	Grade 1	21
		Grade 2	33
		Grade 3	33
		Grade 4	47
		Grade 5	36
		Grade 6	28
4.	MNA Score		
	Malnutrition	10	5.1
	Malnutrition Risk	165	83.3
	Good Nutrition	8	4.0
	Not recorded	15	7.6
5.	BMI by age		
	Obesity	0	0
	Excess weight	8	4.04
	Ideal weight	24	12.1
	Under weight	166	83.8

The data above shows that most of the children are suffer nutritional deficiencies that require quick and appropriate anticipation. The percentage of underweight children is 83.8%, which indicates a lack of calorie intake in the short term. The assessment of nutritional status is based on the categories issued by the Ministry of Health for children aged 5-18 years according to the Body Mass Index by age (BMI/U). The nutritional status of children based on BMI/U is categorized as follows [5]–[7]:

- Very thin (z-score < -3 SD)
- Thin (z-score -3 SD to < -2 SD)
- Normal (z-score -2 SD to 1 SD)
- Fat (z-score > 1 SD to 2 SD)
- Obesity (z-score > 2 SD).

The results of anthropometric measurements of elementary school students are far above the national figure according to Riskesdas data in 2013 that shows the percentage of children aged 5-12 years with a thin body condition reaches 11.3% [8]. These problems must get attention so that they will not cause interference with children both in growth, development, and health. Fulfillment of good nutrition will make a normal body weight, the body is not susceptible to infectious diseases, increase work productivity and avoid chronic diseases and premature death. Conversely, the non-optimal nutritional needs can cause the body to be susceptible to infectious and non-communicable diseases such as cardiovascular disease, diabetes, and cancer [9]–[12]. If there is no action, this condition can interfere with growth [13], [14]. The scholastic performance and nutritional status are statistically significant associations [15]. The fulfillment of student nutrition is carried out by the organizers of the Islamic boarding school which in its implementation is assisted by the students. Menu planning is adjusted to the availability of the budget, but has not fully paid attention to the nutritional needs and children's food habits. Malnutrition is a problem in developing countries such as India, Nepal, and African countries. However, there are also cases reported in Saudi Arabia [16]–[19].

The nutritional status of students in this Islamic boarding school is still much higher than the national figure for ages 5-12 years. The results of the Nutrition Status Monitoring in 2017 the percentage of children with the criteria of being thin and very thin is 10.9% [7]. Several related factors are the level of nutritional knowledge of food providers, infectious diseases, breastfeeding, parasitic diseases, congenital diseases, vitamin A supplementation, maternal care during pregnancy, water supply and sanitation, socio-economic status, health-seeking behavior energy consumption levels, and protein consumption levels [20]–[23]. More in-depth research is needed to determine the causes of high underweight.

Education about balanced nutrition is delivered to students, teachers, and boarding school administrators. Adherence to the WHO recommended feeding regimen is associated with better nutritional status [24], [25]. The educational material provided includes the understanding of the pillars of balanced nutrition, they are:

- The importance of an active lifestyle and exercise,
- Maintain ideal body weight,
- Eating a variety of foods, and
- Implement a clean and healthy lifestyle.

The provision of food must also meet the elements of complete nutrition (carbohydrates, protein, fat, vitamins, minerals, water and fiber) in sufficient quantities, not excessive and not deficient, and appropriate for the body's needs. The frequency of scheduled feeding is 3 times a day, the source of nutrients is varied. The students should not be allowed to eat outside and have regular exercise activities [18], [26].

Based on the screening results, the service team together with the advisers of the Islamic boarding school agreed to provide education on balanced nutrition and additional calorie intake. Each child with low body weight is given an additional intake of 100 kcal/day in the form of a modified Formula 100 with a dose of 1 sachet/day. The modified F100 is made from milk, sugar, vegetable oil, mineral mix and water.

The formula contains energy 100 kcal (420 kJ), protein 2.9 g, lactose 4.2 g, potassium 5.9 mmol, sodium 1.9 mmol, magnesium 0.73 mmol, zinc 2.3 mg, and copper 0,25 mg. The percentage of energy from protein is 12% and fat is 53% [27]–[29]. To improve the nutritional status the most appropriate treatment is the provision of ready-to-use supplementary food based on local food [18], [30], [31].



Fig. 4. Giving symbolic supplementary nutrition packages to the students

The impact of health education and balanced nutrition is obtained from the recalling of elementary boarding school teachers toward the students of elementary school age. Most of the students began to understand the concept of balanced nutrition with an indication that the students could mention the pillars of balanced nutrition. The students better understand the benefits of maintaining cleanliness, ideal body weight, and the benefits of exercising. The students also began to understand the various sources of food. Anthropometric re-measurements were not carried out due to the Covid-19 pandemic.

4. Conclusion

The nutritional status of elementary school-aged students at the Ash Sholihah Islamic boarding school based on BMI is mostly underweight. Additional intake has not been able to provide maximum results in the short term. Improvement of nutritional status should be carried out comprehensively involving various parties involved in food administration. Education about balanced nutrition by involving teachers at Islamic boarding schools is quite effective in providing understanding to the students.

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Declarations

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