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**The Correlation of Nutritional Knowledge and Snack Consumption Habits with Nutritional Status in 5th Grade Students of SDN Wadungasih 2 Sidoarjo**

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**ABSTRACT**

Indonesia suffers from nutritional problems related to nutrient deficiencies and excesses. The intake of well-balanced food consumed by children is low, while the intake of unhealthy snacks is high. Based on 2018 Basic Health Report, the prevalence of BMI/A children categorized as overweight was 10.8%, while obesity was 9.2%. This study aimed to determine the correlation of nutritional knowledge and snack consumption habits with nutritional status in 5th grade students of SDN Wadungasih 2 Sidoarjo. This study used cross sectional method involving 58 students through saturated sampling technique in 6 months period. The data of nutritional knowledge and snack consumption habits were collected through a questionnaire and interview. Nutritional status was also measured by the weight and height. Based on the Spearman test results, it was found that there is a correlation between nutritional knowledge and nutritional status in 5th grade students ( $p = 0.000$ ), and there is a correlation between snack consumption habits and nutritional status in 5th grade students ( $p = 0.001$ ). Schools are expected to maintain the nutritional knowledge and consumption habits by providing healthy canteen facilities. For students, it is expected to be more selective in choosing food or snacks that will be consumed.

**Keywords:** Nutritional Knowledge, Snack Consumption Habits, Nutritional Status

**BACKGROUND**

Health is an important component of human well-being. According to Minister of Health Regulation Number 41 of 2014 on Balanced Nutrition Guidelines, adequate nutrition roles to improve intelligence, work productivity, and improved overall quality of health (Kementerian Kesehatan Republik Indonesia 2014). Optimal nutrient intake affects individual and community health (Kemenkes RI 2023). The Government of Indonesia's Law Number 17 of 2023 on Health also emphasizes the importance of nutrition fulfillment to improve the quality of individuals and communities, through safe, nutritionally balanced, and diverse food consumption patterns; access to quality nutrition services according to the development of science

and technology; and early response to food and nutrition vulnerability (Presiden Republik Indonesia 2023). However, nutritional problems in Indonesia are not optimal, especially in children who are in a phase of rapid growth (Avila, D. Z., Alkhair, Khatimah, N. H. and Iksan 2023). These problems include nutrient deficiencies and excesses, which are caused by a low intake of well-balanced nutritious foods and high consumption of unhealthy snacks. In school-aged children (6-12 years), snacks play an important role in energy and protein adequacy. However, snacks are often high in calories but low in fiber, such as instant noodles, chips, fried foods, etc (Herliani and Heryati 2020). Past research has shown that consumption of

snacks that do not fulfill nutritional criteria can have a negative impact on children's health, such as decreasing their appetite for healthy foods and affecting their nutritional status (Harahap, Widarti, and Mataram 2020). The prevalence of nutritional status of Body Mass Index by Age (BMI/A) from the 2018 Basic Health National Report shows that a lot of Indonesian children are malnourished, with 2.4% severely thinness, 6.8% thinness, 10.8% overweight, and 9.2% obese (Badan Penelitian dan Pengembangan Kesehatan 2018). High consumption of sweet and salty foods is also a risk to children's health. High consumption of sweet and savory foods also pose a risk to children's health (Wiradnyani and Dkk. 2021)(Putri and Lydia Fanny, Nursalim 2021). This food consumption pattern requires special attention to improve a good and well-balanced diet (Harvi 2020)(Mudiani, Nursanyoto, and Gumala 2020). An early research at SDN Wadungasih 2 Sidoarjo showed that many students did not implement healthy and balanced snack consumption. This study found that out of 20 respondents, 10% were underweight, 50% were normal, 30% were overweight, and 10% were obese. Most of the students buy snacks at the canteen or in front of the school, with popular snacks such as chiki, fried food, and ice. These snacks are frequently unhealthy and lack a balanced nutrition. Based on the explanation above, there is a necessity to examine about the topic of healthy and balanced snack consumption in elementary school students. The researchers are interested in conducting this research with the title "The Correlation of Nutritional Knowledge and Snack Consumption Habits with Nutritional Status in 5<sup>th</sup> Grade Students of SDN Wadungasih 2 Sidoarjo". This study aims to determine the correlation between nutritional knowledge and snack consumption habits with students nutritional status, as well as identify various characteristics and habits that affect their

nutritional status. This research is an analytical observational study with a cross sectional design conducted at SDN Wadungasih 2 Sidoarjo for 6 months, during the period October 2023 - April 2024. The population in this study were 58 students of SDN Wadungasih 2 Sidoarjo who were studying in grade 5. The sample in this study were 58 students, which were taken using the saturated sample method because of less than 100 people. In the process of data collection, the methods involve questionnaire filling, interviews, and anthropometric measurements, followed by univariate analysis and Spearman correlation test analysis to obtain a comprehensive result.

## RESULTS

SDN Wadungasih 2 Sidoarjo is an elementary school located at Java Street Number 121, Wadungasih, Buduran District, Sidoarjo, East Java Province, 61252. The school was established in 1982 as a public school. The educational period is six years, from grade 1 to grade 6. The results of the study include identification of respondents characteristics (age and gender), nutritional knowledge, snack consumption habits, nutritional status, and results of Spearman correlation test analysis of each variable.

**Table 1.** Frequency Distribution of Characteristics by Age 5<sup>th</sup> Grade Students of SDN Wadungasih 2 Sidoarjo

Age	Frequency	%
10 years old	4	6.9
11 years old	41	70.7
12 years old	13	22.4
<b>Total</b>	<b>58</b>	<b>100</b>

Referring to the table 1, majority of 5<sup>th</sup> grade students at SDN Wadungasih 2 Sidoarjo are 11 years old, which is 41 students (70.7%).

**Table 2.** Frequency Distribution of Characteristics by Gender 5<sup>th</sup> Grade Students of SDN Wadungasih 2 Sidoarjo

Gender	Frequency	%
Male	32	55.2
Female	26	44.8
<b>Total</b>	<b>58</b>	<b>100</b>

Referring to the table 2, majority of 5<sup>th</sup> grade students at SDN Wadungasih 2 Sidoarjo are male, which is 32 students (55.2%).

**Table 3.** Frequency Distribution by Nutritional Knowledge 5<sup>th</sup> Grade Students of SDN Wadungasih 2 Sidoarjo

Category of Knowledge	Frequency	%
Less (<60%)	9	15.5
Enough (60-75%)	12	20.7
Good (>75%)	37	63.8
<b>Total</b>	<b>58</b>	<b>100</b>

Referring to the table 3, majority of 5<sup>th</sup> grade students at SDN Wadungasih 2 Sidoarjo have good nutritional knowledge (>75%), which is 37 students (63.8%).

**Table 4.** Frequency Distribution by Snack Consumption Habits 5<sup>th</sup> Grade Students of SDN Wadungasih 2 Sidoarjo

Category of Snack Consumption Habits	Frequency	%
Low (<15% of daily nutrient allowance)	6	10.3
Good (15-20% of daily nutrient allowance)	35	60.4
High (>20% of daily nutrient allowance)	17	29.3
<b>Total</b>	<b>58</b>	<b>100</b>

Referring to the table 4, majority of 5<sup>th</sup> grade students at SDN Wadungasih 2 Sidoarjo have good snack consumption habits (15-20%), which is 35 students (60.4%).

**Table 5.** Frequency Distribution by Nutritional Status 5<sup>th</sup> Grade Students of SDN Wadungasih 2 Sidoarjo

Category of Nutritional Status	Frequency	%
Severely thinness	0	0
Thinness	4	6.9
Normal	36	62.1
Overweight	10	17.2
Obese	8	13.8
<b>Total</b>	<b>58</b>	<b>100</b>

Referring to the table 5, majority of 5<sup>th</sup> grade students at SDN Wadungasih 2 Sidoarjo have normal nutritional status, which is 36 students (62.1%).

**Table 6.** Cross Tabulation Based on the Correlation of Nutritional Knowledge with Nutritional Status 5<sup>th</sup> Grade Students of SDN Wadungasih 2 Sidoarjo

Nutritional Knowledge	Nutritional Status								Total	<i>p</i> value	
	Thinness		Normal		Overweight		Obese				
	n	%	n	%	n	%	n	%			
Less	1	11.1	0	0	2	22.2	6	66.7	9	100	0.000
Enough	2	16.7	1	8.3	7	58.3	2	16.7	12	100	
Good	1	2.7	35	94.6	1	2.7	0	0	37	100	
<b>Total</b>	<b>4</b>	<b>6.9</b>	<b>36</b>	<b>62.1</b>	<b>10</b>	<b>17.2</b>	<b>8</b>	<b>13.8</b>	<b>58</b>	<b>100</b>	

The results of analysis used Spearman correlation test, it showed that  $p$  value = 0.000. Since  $p$  value <0.05,  $H_0$  is rejected and  $H_1$  is accepted. This means

that there is a significant correlation between nutritional knowledge and nutritional status of 5<sup>th</sup> grade students at SDN Wadungasih 2 Sidoarjo.

**Table 7.** Cross Tabulation Based on the Correlation of Snack Consumption Habits with Nutritional Status 5<sup>th</sup> Grade Students of SDN Wadungasih 2 Sidoarjo

Snack Consumption Habits	Nutritional Status								Total	<i>p value</i>	
	Thinness		Normal		Overweight		Obese				
	n	%	n	%	n	%	n	%			
Low	4	66.7	2	33.3	0	0	0	0	6	100	0.001
Good	0	0	34	97.1	1	2.9	0	0	35	100	
High	0	0	0	0	9	52.9	8	47.1	17	100	
<b>Total</b>	<b>4</b>	<b>6.9</b>	<b>36</b>	<b>62.1</b>	<b>10</b>	<b>17.2</b>	<b>8</b>	<b>13.8</b>	<b>58</b>	<b>100</b>	

The results of analysis used Spearman correlation test, it showed that  $p$  value = 0.001. Since  $p$  value <0.05,  $H_0$  is rejected and  $H_1$  is accepted. This means that there is a significant correlation between snack consumption habits and nutritional status of 5<sup>th</sup> grade students at SDN Wadungasih 2 Sidoarjo.

## DISCUSSION

### Characteristics of Students

This study involved 5<sup>th</sup> grade students of SDN Wadungasih 2 Sidoarjo in the 2023/2024 academic year, with a sample of 58 students consisting of two classes, 5A and 5B. Data on student characteristics were collected by completing a questionnaire of personal identity, which showed that the majority of students were 11 years old (70.7%), which is 41 people, and dominated by males (55.2%) with a total of 32 students. Based on World Health Organization (WHO) guidelines, the age of 7-15 years is a period of school children who are vulnerable to nutritional problems, a period of rapid growth and development that requires increased energy and nutrient intake (WHO n.d.). The other research highlights the importance of fulfillment for food intake in this group, both through main meals and snacks (Fikawati 2020). During this period, nutrients take on an important role in supporting the immune system,

tissue maintenance, as well as muscle growth and nutrient reserves for later adolescence. Males generally gain muscle mass faster than females, who gain fat mass more quickly (4% higher) (Rahmawati 2022). The tendency of higher physical activity in males also affects their energy needs, while females require relatively less energy adequacy. The Recommended Dietary Allowances (RDA) indicates that at the age of 10-12 years, the difference in energy adequacy between males and females is 100 kcal. These age and gender characteristics strongly influence the growth and development of school children (Kementerian Kesehatan Republik Indonesia 2019).

### Nutritional Knowledge of 5<sup>th</sup> Grade Students at SDN Wadungasih 2 Sidoarjo

Students nutritional knowledge was measured through a 15 question form, which was tested for validity and reliability. This questionnaire assesses knowledge about nutrition related to food and snacks, with the assessment results categorized into less (<60%), enough (60-75%), and good (>75%). The results showed that 37 students (63.8%) had nutritional knowledge in the good category. According to Notoatmodjo, knowledge is an accumulation of sensory experiences that form a person's understanding (Notoatmodjo 2019). Aspects that impact

nutritional knowledge include education, age, mass media, and environment (Cahyaningsih 2021)(Zuhriyah 2021). The findings show that students have a good knowledge of food sources of carbohydrates, proteins, fats, vitamins and minerals, also snacks. Most students had received basic nutrition materials before grade 5 and received additional information through social media. These findings support that the nutritional knowledge of grade 5 students at SDN Wadungasih 2 Sidoarjo is generally good, due to the materials received and the easy access to nutritional information in the current digital era.

### **Snack Consumption Habits of 5<sup>th</sup> Grade Students at SDN Wadungasih 2 Sidoarjo**

Snack consumption habits were measured by using Semi Quantitative Food Frequency Questionnaire (SQ-FFQ), which includes more than 10 types of snacks. The results of the study showed that the majority of students (60.4%) had good snack consumption habits. Harikedua et al., observed that snack consumption habits are often difficult to be changed because they are part of established behaviors (Harikedua, Legi, and Sarullah 2021). Environmental factors, such as the effect of friends, can increase children's desire to buy snacks. Wiriastuti's research added that although clean and healthy food is provided at home, children often prefer snacks because of their delicious and interesting taste. However, excessive consumption of snacks carries health risks, especially in relation to infection with pathogenic germs that can cause poisoning (Wiriastuti 2019). BPOM also noted that 60% of school children's snacks are not safe for consumption (BPOM RI 2021a). Although most students snack consumption habits are good, there are still students with low or high snack habits that can affect their nutritional status. Education on healthy snack consumption and the application of a well-balanced nutrition are essential to

prevent health risks due to the consumption of unhealthy snacks (Al'Aliyyu and Adi 2023).

### **Nutritional Status of 5<sup>th</sup> Grade Students at SDN Wadungasih 2 Sidoarjo**

The nutritional status of students was assessed through anthropometric measurements, including body weight and height measurements. Based on the data obtained, the majority of students were in the good nutritional status category (62.1%). Nutritional status is affected by the intake of nutrients from food and infectious diseases. According to Supariasa et al., nutritional status is influenced by direct factors such as food intake and infection, as well as indirect factors such as food availability, maternal and child care, also health facilities (Supariasa, Bakri, and Fajar 2020). Good nutritional knowledge can impact the choice of food consumed and contribute to nutritional status. A good knowledge of nutrients enables parents to provide the right foods for their children, which has a positive impact on nutritional status (Kemenkes RI 2017).

### **The Correlation between Nutritional Knowledge and Nutritional Status of 5<sup>th</sup> Grade Students at SDN Wadungasih 2 Sidoarjo**

The results of Spearman correlation analysis shows that there is a significant correlation between nutritional knowledge and nutritional status, with  $p$  value = 0.000. This means that students with good nutritional knowledge are likely to have good nutritional status. Some research emphasizes that good knowledge will affect the actions taken, including food selection. Namira & Indrawati's research and other studies show that high nutritional knowledge correlates with good nutritional status. Conversely, low nutritional knowledge can lead to bad food choices, which risk nutritional problems such as malnutrition, overweight, or obesity (Namira and Indrawati 2020)(Putri and Arifin 2020). Nutritional knowledge can

support individual food choices, therefore contributing to optimal nutritional status (Siregar and Anshari 2024).

### **The Correlation between Snack Consumption Habits and Nutritional Status of 5<sup>th</sup> Grade Students at SDN Wadungasih 2 Sidoarjo**

Spearman correlation analysis shows a significant correlation between snack consumption habits and nutritional status, with  $p$  value = 0.001. The data shows that students with good snack consumption habits mostly have good nutritional status, while students with high snack consumption habits are likely to have an overweight status. Juliniar & Lubis reported that snack consumption habits are strongly associated with nutritional status, and other study showed that high snacking habits may lead as a risk factor for having abnormal nutritional status (Juliniar and Lubis 2021). BPOM RI determined that snack consumption should not exceed 20% of total daily energy intake (BPOM RI 2021b). Excessive consumption of snacks can cause nutritional imbalances, encourage fat accumulation, and increase the risk of non-communicable diseases (Anikasari and Anggoro 2023). The importance of education on healthy snack consumption habits and food hygiene is very relevant to maintain optimal nutritional status (Lutfi 2021).

### **CONCLUSION**

Based on the results of the research, it can be concluded that the characteristics of 5th grade students of SDN Wadungasih 2 Sidoarjo show that the majority are 11 years old (70.7%), with a gender category dominated by males (55.2%). Nutritional knowledge among students are mostly in the good category (63.8%), which indicates a good understanding of nutrition and health. The students snack consumption habits were also mostly in the good category, with the habit of consuming snacks within the recommended limits

(60.4%). The nutritional status of students showed that the majority were in the normal category (62.1%). Spearman correlation test revealed a significant correlation between nutritional knowledge and nutritional status ( $p$  value = 0.000), as well as between snack consumption habits and nutritional status ( $p$  value = 0.001). Based on the results of this study, some suggestions that can be considered are : First, schools are expected to maintain and increase students nutritional knowledge and good snack consumption habits. The school can consider providing healthy canteen facilities around SDN Wadungasih 2 Sidoarjo to support the consumption of well-balanced snacks. Second, students expected to be more selective in choosing food or snacks that will be consumed by paying attention to ingredients, packaging, color, aroma, taste, and expired date, to ensure the accuracy of nutritious and balanced snack consumption.

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