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Original Article

Quality and Pattern of Breakfast Through the GEMPITA PROGRAM at Palu City, Central Sulawesi

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ABSTRACT

Many school-aged children in Indonesia still skip breakfast, which can have an impact on their learning concentration and academic performance at school. This study aims to describe the quality and pattern of breakfast through the GEMPITA Program at Palu City, Central Sulawesi. This was a descriptive study with a sample size of 228 elementary and junior high school students in Palu City. Data collection was performed through interviews using structured questionnaires and anthropometric measurements. The study results show that the majority of respondents had pocket money of more than IDR 5,000/day, came from families with fathers of senior high school graduates and non-civil servants, the mothers generally had primary and secondary education and were housewives. Furthermore, the majority of respondents had a routine breakfast habit by 57.9%, 20.2% had breakfast sometimes and 21.9% never had breakfast. Furthermore, only 32.9% had quality breakfast menu. Regarding snack consumption habit, the majority of respondents by 77.2% consumed snacks more than three times a week and more than half of respondents by 58.3% had the habit of bringing packed meal, while 41.7% never brought packed meal. An assessment of the nutritional status of respondents showed that there were still 33.3% who were undernourished and 7.9% who were over nourished and obese. Stunting status occurred in 18.9% of respondents. The breakfast habit, quality and pattern of elementary and high school students still need to be improved. The GEMPITA program is an alternative program to improve the pattern and quality of breakfast for elementary and high school-aged children in Palu City.

Keywords: Breakfast, School-Aged Children, GEMPITA Program

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INTRODUCTION

Breakfast is the activity of eating after a long period of fasting and sleeping at night which is the most important part of daily life [1]. Breakfast will provide energy to carry out activities and contribute at least 26% to daily energy intake [2]. Breakfast is important for school-aged children to meet daily energy needs during the process of learning, thinking,

analyzing and doing activities.

The behavior of skipping breakfast is common among school-aged children and teenagers in Indonesia. A study that observed breakfast consumption among 2,629 Indonesian children aged 2–12.9 years found that only 31.6% had quality breakfast. Children with lower socioeconomic conditions tended to consume breakfasts with poor nutritional quality and only 10% of teenagers enjoyed a high-quality breakfast [3].

Breakfast habit are related to school academic performance. A pervious study conducted in Ethiopia explained that there was a correlation between breakfast and academic achievement and skipping breakfast could reduce academic performance, cognitive abilities as well as behavioral aspects [4–6]. Students who skipped breakfast had lower levels of school achievement [7–9]. Another study conducted in China further revealed that students' low frequency of breakfast was related to lower performance on the 20m shuttle sprint test to assess the strength, flexibility, speed and endurance of intermediate athletes [10].

A good breakfast considers the quality of the food eaten. This is important since poor quality breakfast for school-aged children will also worsen health conditions. A study conducted in poor rural areas of Hubei Province, China, showed that 79.7% of elementary and middle school school-aged children had breakfast, but the nutritional quality of breakfast was poor, especially among female students and elementary school students[9]. The quality of breakfast for school-aged children could influence the physical activity and nutritional status of school-aged children[11]. In addition, a good quality breakfast could prevent weight gain among children and teenagers which was related to overweight and obesity[12]. A good quality breakfast should provide good quality nutrition or diet to support health performance and it was found to reduce the risk of insulin resistance (IR) since an early age among school-aged children [13].

In Indonesia, the rate of malnutrition among school-aged students was still quite high. Elementary school students in Indonesia had many problems in daily consumption of breakfast and vegetables [14]. A study conducted in America showed that school-based culinary courses could increase the eating literacy of school-age children and improve their eating behavior. This study determines the impact of a school-based culinary program on food literacy and consumption of vegetables, fruit, and breakfast among students aged 9 and 10 years[15]. Breakfast programs in collaboration with school canteens must be implemented comprehensively, and it should be linked to a food security and nutrition approach and designed and implemented in accordance with the food needs and specific socioeconomic needs of each region [16] and implemented in a consistent and flexible manner [17]. The school canteen is considered appropriate to provide breakfast for school-aged children [18–26].

The Central Sulawesi Provincial Health Office, in collaboration with the Palu City Education Office, Al-Khairat University and the Palu Patklin Health Polytechnic, implemented the GEMPITA program (Mangande Padondo ante Kita Movement or the Joint Breakfast Movement) at School. The implementation of Breakfast Program for School-aged children was based on Central Sulawesi Province Regional Regulation Number 4 of 2021 concerning the Implementation of Regional Innovation. This movement aims to improve the pattern and quality of breakfast among school-aged children. The current study aims to describe the quality and pattern of breakfast through the GEMPITA Program at Palu City, Central Sulawesi.

METHOD

This was a descriptive study conducted in September-October 2023. The study samples were selected using total sampling technique which involved 228 school-aged children aged 7-16 years. The data collected were characteristics including age, gender, parental education and pocket money. In addition, data on knowledge on nutrition and breakfast, nutritional status, stunting condition, breakfast habit, breakfast quality, snack consumption, and habit of bringing packed meal were also collected.

Data collection on children's characteristics, knowledge, quality and breakfast patterns were performed through interviews using structured questionnaires, while data on nutritional status were collected through anthropometric measurements. Knowledge about breakfast was categorized as poor if the percentage of correct answers was <60%, moderate if the percentage of correct

answers was 60-80% and good if the percentage of correct answers was >90%. BMI/Age nutritional status data was processed based on Z-Score values using the WHO AntroPlus application. Breakfast quality data was categorized as a quality breakfast if the breakfast menu contained 4 food ingredients consisting of carbohydrate sources, animal protein, vegetable protein and vegetables. Data analysis was carried out descriptively using the JASP statistical application.

Interventions through the GEMPITA Program were provided over a period of 20 days. Menu variations used a 5 day menu cycle. Breakfast was provided before 10.00 am. The average energy for this breakfast was ±500 kcal. The menu given on day 1 consisted of white rice, fish with green chili sauce, clear spinach, carrots, fried tofu. Day 2 menu consisted of white rice, meatball soup, gambas and corn fritters. Day 3 menu consisted of white rice, flour fried chicken, tomato sauce, and stir-fried cauliflower and carrot. Day 4 menu consisted of white rice, vegetable omelette, tempeh with soy sauce, and sautéed water spinach. Day 5 menu consisted of white rice, chopped chicken with sweet and sour sauce, capcay, and fried tempeh.

Figure 1. Intervention Menu Day 1

Figure 2. Intervention Menu Day 2

Figure 3. Intervention Menu Day 3

Figure 4. Intervention Menu Day 4

Figure 5. Intervention Menu Day 5

RESULTS

The age range of respondents in this study was around 7-16 years with the majority frequency of 7-12 years by 124 children (54.4%). Gender was dominated by female as many as 115 children (50.6%). The majority of fathers' education was senior high school as many as 78 people (35.1%) and the majority of mothers' education was elementary school as many as 78 people (34.2%). The majority of fathers' occupation were dominated by non-civil servants/TNI/Police as many as 189 people (82.9%) while the majority of mothers' occupation were dominated by working at home or as housewives as many as 193 people (84.6%) (Table 1).

The majority of school-aged children had pocket money of >Rp. 5,000 (77.6%). The category of knowledge on breakfast was dominated by good knowledge (>90%) as many as 123 people (53.9%). The classification of nutritional status (BMI/Age) and (Height/Age) was applied in accordance with WHO in 2007 which included 4 categories, namely Under Nutrition (-3≤SD<-2), Good Nutrition (-2≤SD<+1), Over Nutrition (1≤SD<+2), and Obesity (>+2SD). Based on this classification, the results showed that the majority of samples in this study were classified as having good or normal nutritional status, namely 134 people (58.8%). Meanwhile, nutritional status (Height/Age) category found 43 stunted children (18.9%) (Table 1).

Table 1. Characteristics of the Study Samples.

Variable	Total	
	N	%
Age		
7-12	124	54.4
13-16	104	45.6
Gender		
Male	113	49.5
Female	115	50.5
Father's Education		
College	10	4.4
SHS	78	35.1
JHS	45	20.2
Elementary	70	31.5
No Formal Education	19	8.5
Mother's Education		
College	15	6.5
SHS	70	30.7
JHS	55	24.1
Elementary	78	34.2
No Formal Education	10	4.4
Father's Occupation		
Civil Servants/TNI/Police	6	2.6
Non Civil Servants/TNI/Police	189	82.9
Unemployed	33	14.5
Mother's Occupation		
Civil Servants/TNI/Police	7	3.1
Non Civil Servants/TNI/Police	28	12.3
At home (housewife)	193	84.6
Pocket Money		
≤IDR 5,000		
>IDR 5,000	51	22.4
Knowledge on Nutrition and Breakfast	177	77.6
Poor (<60%)		
Moderate (60-80%)	63	27.6
Good (>90%)	42	18.4
Nutritional Status (BMI/Age)	123	53.9
Under Nutrition (-3≤SD<-2)		
Good Nutrition (-2≤SD<+1)	76	33.3
Over Nutrition (1≤SD<+2)	134	58.8
Obesity (>+2SD)	12	5.3
Nutritional Status (Height/Age)	6	2.6
Stunting		
Non-Stunting	43	18.9
	185	81.1

Source: Primary Data, 2023

Regarding breakfast habit, it was shown that the majority of respondents (57.9%) had routine breakfast, while the rest only had breakfast sometimes (20.2%), and 21.9% never had breakfast. Data on breakfast quality showed that the majority of respondents had a poor quality breakfast. 32.9% of respondents had a quality breakfast menu, while 67.1% had non-quality breakfast menu. Data on snack consumption revealed that the majority of respondents (77.2%) consumed snacks more than three times a week, while 22.8% consumed snacks occasionally, namely three times or less a week. Such findings indicated that the frequency of snack consumption among respondents was quite high. Data on the habit of bringing packed meal showed that more than half of respondents (58.3%) had the habit of bringing packed meal, while 41.7% did not bring packed meal. This can be interpreted that most respondents had the habit of bringing packed meal as part of their diet (Table 2).

Table 2. Habit and Quality of Breakfast

Variable	Total	
	N	%
Breakfast Habit		
Often (routine)	132	57.9
Sometimes	46	20.2
Never		21.9
Breakfast Quality		
Good	75	32.9
Poor	15	67.1
Snack Consumption		
Frequent (>3x/week)	17	77.2
Occasionally (≤3x/week)	6	22.8
Habit of bringing packed meal		
Yes	133	58.3
No		41.7

Source: Primary Data, 2023

Figure 6. GEMPITA Program Recipients

Figure 7. GEMPITA Program Recipients

DISCUSSION

School-aged children are in an age group that requires good nutritional intake to increase their growth and development. It is important to pay attention to the quality and consumption patterns of food. The period of growth and development at school age is influenced by the consumption of quality food. Quality food plays a direct role in the process of physical growth, development of the nervous system and brain, and the level of intelligence of children. Optimizing the nutritional status of school-aged children has the potential to produce quality human resources [27].

Our findings showed that mother's education was better than father's education, this is a modality in the possession of knowledge about nutrition and child care [28,29]. Our further finding revealed that even though mother's education was higher than father's education, there were 84.6% of housewives who worked at home, this allowed children to get breakfast, because mothers did not work outside the home. A previous study found that breakfast consumption was closely related to family support factors. Parents who had higher education are expected to have good literacy regarding breakfast habits and behavior so that children may not skip breakfast [30]. Children of mothers with a high level of education were more likely to eat breakfast every day than children of mothers with a low level of education [28,31].

The type of employment of parents can influence the quality of school-aged children's breakfast in several ways. This is related to parents' income, which determines children's breakfast habits. A previous study showed that the effect of income was closely related to food purchasing power. Such findings indicated that socioeconomic factors in the family significantly contributed to breakfast consumption [32]. Additionally, the type of work of parents can influence their ability to provide time and resources for their children's breakfast. For example, parents with demanding or irregular work schedules may find it difficult to ensure their children get a healthy breakfast every day. Long work hours or early morning shifts may limit parents' time in preparing breakfast for children or monitoring their breakfast habit. In some cases, financial constraints associated with certain types of work can also impact the quality of breakfast parents can give children.

The relationship between pocket money and the quality and pattern of breakfast among school-aged children might vary depending on cultural, social, and economic factors in the family[33]. A study conducted at the West Bank found that breakfast consumption was not significantly related to pocket money[34]. However, the study did not specifically address

breakfast quality or how pocket money may influence breakfast patterns.

Knowledge on breakfast can significantly influence the quality and breakfast pattern among school-aged children. Good knowledge on nutrition, choosing healthy snacks in the school canteen and the importance of breakfast among students would encourage children to not skip breakfast[35]. Good literacy among school-aged children could also increase understanding of knowledge and the habit of not skipping breakfast before going to school[36]. The role of comprehensive schools and canteens could may increase nutritional literacy, food consumption, as well as attitudes and structure of students' eating patterns in improving eating habits and choosing healthy snacks[23,37]. Social support from cross-sector roles such as community organizations, city government, police, educational institutions and mass media were considered to have an impact on increasing students' nutritional and health knowledge regarding breakfast habit[38].

Under nutrition status of 33.3% indicated the importance of the need for implementing intake interventions. The breakfast intervention was chosen because this intervention is easier to observe and control compared to interventions in the form of lunch and dinner. It is expected that breakfast intervention can provide sufficient energy to carry out activities since it was found to contribute at least 26% to school-aged children's daily energy intake (39). Findings related to malnutrition status based on BMI/Age were more numerous than stunting status based on Geight/Age (33.3% vs 18.9%), indicating that acute problems were greater than chronic problems. The right menu composition to overcome the problem is by providing intervention in the form of 60% carbohydrates, 15% protein and 25% fat [17].

The quality and pattern of a good breakfast could influence the level of health and had a positive impact on children's physical and mental health, energy and cognitive abilities[11,39–45]. A quality breakfast consisting of 4 stars, namely food sources of carbohydrates, animal protein, vegetable protein, vegetables and fruit, is the key to a quality breakfast menu[46]. A good breakfast provides important nutrients from macronutrients for children's growth and development, including fiber, potassium, calcium, vitamins C and D, folate, iron, zinc and magnesium which contribute an average of around 474 kcal of energy[39,47]. Moreover, a good breakfast was able to control blood glucose levels, fulfill daily intake earlier, prevent overweight and obesity and reduce the risk of other metabolic diseases[41,44,48–50]. A good breakfast pattern includes various aspects to ensure children get adequate nutrition, the energy they need, and have healthy eating habits [40–42].

Several studies have explored the relationship between snack consumption and breakfast habit. A study conducted in Portugal during the lockdown due to COVID-19 found a positive relationship between snack consumption and breakfast consumption. The habit of skipping breakfast seemed to be related to changes in snack consumption[51]. In addition, the habit of consuming snacks excessively or as a substitute for breakfast could have a negative impact on health due to imbalanced nutrition obtained, so that skipping breakfast was related to a lack of vitamin and mineral intake [52,53].

The habit of bringing packed meal to school, especially a healthy breakfast, is related to school-aged children's learning achievement through its impact on nutrition, energy levels and cognitive function. Previous studies showed that healthy eating habits, including regular breakfast consumption, were related to higher perceived school performance, academic performance and cognitive control among teenager[4,5,33,54]. School-based breakfast programs are important in supporting improvements in the quality and pattern of breakfast for school-aged children. School-based breakfast programs has been implemented in various countries to meet nutritional needs, get a quality breakfast and a varied menu, save money, increase preferences for breakfast habit and provide benefits for students from low-income families[17,40,55].

Improvement in breakfast habit and the quality of school-aged children's breakfast requires serious concern in Indonesia since the rate of malnutrition among school students was still quite high. Elementary school students in Indonesia have many problems in consuming breakfast and vegetables daily[14]. The Indonesian government, through Minister of Health Regulation Number 41 of 2014 concerning Guidelines for Balanced Nutrition, emphasizes the importance of breakfast as a special message for balanced nutrition for school-aged children. Breakfast programs in collaboration with school canteens must be

implemented comprehensively, and it should be linked to a food security and nutrition approach and designed and implemented in accordance with the food needs and specific socioeconomic needs of each region [16] and implemented in a consistent and flexible manner[17].

The GEMPITA program is an alternative program based on Central Sulawesi Province Regional Regulation Number 4 of 2021 concerning Implementation of Regional Innovation to improve the pattern and quality of school-aged children's breakfast in Palu City. Fulfillment of breakfast for a period of 20 days provided to school and junior high school-aged children had a direct impact on student participation, fulfillment of quality breakfast intake, active participation from the canteen and school, as well as responsive support from parents to support the implementation of this alternative program.

CONCLUSIONS

Data regarding breakfast habit revealed that there were still students who had breakfast sometimes and never had breakfast. Most of the breakfast menu consumed was not of good quality. Data regarding snack consumption habit also showed that most of students consumed snacks more than three times a week. Furthermore, almost half of respondents had the habit of not bringing packed meal to school. School breakfast programs can be an alternative solution in improving the quality and pattern of breakfast among school-aged children. Implementation of this program can meet intake needs, provide quality breakfast, and provide benefits for students, especially those from low-income families. The habit of bringing packed meal to school, especially a healthy breakfast, was closely related to learning achievement. The GEMPITA (Joint Breakfast Movement at Schools) program in Palu City is a local solution to improve the pattern and quality of breakfast.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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