

RELATIONSHIP BETWEEN THE HABIT OF BRINGING LUNCH AND THE LEVEL OF MACRONUTRIENT ADEQUACY IN STUDENTS OF SMP N 2 EAST KARAWANG

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Abstract

The habit of bringing lunch is one effort to fulfill nutritional needs. Macronutrient intake is one of the main components that plays an important role in improving the nutritional status of students. This study aims to determine the relationship between the habit of bringing lunch and the level of energy and macronutrient adequacy in SMP N 2 East Karawang students. This research method is quantitative with a cross-sectional design. This study was conducted on 35 students of SMPN 2 East Karawang. The habit of bringing lunch was assessed with the Food Frequency Questionnaire (FFQ) form and intake was assessed using a 1x24-hour food recall interview then descriptive analysis was carried out using SPSS. Most students habitually bring lunch rarely (57.1%). The level of energy adequacy of students. The adequacy level of energy and macronutrients is mostly included in the deficient category, for energy (68.6%), protein (71.4%), fat (48.6%), and carbohydrates (68.6%). There was a significant relationship between the level of adequacy of energy ($p=0.003 < 0.05$) and carbohydrates ($p=0.037 < 0.05$). However, there was no significant relationship between the adequacy level of protein ($p=0.707 < 0.05$) and fat ($p=0.603 < 0.05$) in students of SMPN 2 East Karawang. This study concludes that there is a significant relationship between the habit of bringing lunch with the level of adequacy of energy and carbohydrates in students of SMPN 2 East Karawang.

Keyword: Adequacy Macronutrient, Habit of Bringing Lunch

Introduction

Adolescence is defined by the World Health Organization (WHO), as including children aged 10 to 19 years. Adolescence is a transition period between children and adults characterized by physical and mental changes. The nutritional status of adolescents will be influenced by many factors such as behavior and lifestyle, as well as the availability of food consumed⁽¹⁾. The causes that affect nutritional status can be categorized into direct and indirect factors. Direct factors include food intake and infectious diseases, while indirect factors include knowledge, economic conditions, and the role of health services⁽²⁾.

One of the main factors affecting nutritional status is food consumption patterns. The body needs food to fulfill the needs of the various nutrients it needs⁽³⁾. According to the Ministry of Health of the Republic of Indonesia (2014), balanced nutrition is a daily diet that contains nutrients in the types and amounts that meet the body's needs. It also considers food diversity, physical activity, clean living behavior, and regular weight monitoring to stay within the normal range to prevent nutritional problems⁽⁴⁾.

The nutrients are divided into 2, namely macronutrients and micronutrients. Macronutrients are nutrients that are needed in large quantities in units of grams (g) consisting of carbohydrates, fats, and

proteins, and are the main foods that build the body and produce energy. Micronutrients are nutrients that are needed in small amounts, usually measured in milligrams (mg), and consist of vitamins and minerals⁽⁵⁾. To obtain energy directly, the body requires many macronutrients, including carbohydrates, fats, and proteins. Carbohydrates account for about 65% of total energy, while fat accounts for 20-30 percent, and protein accounts for 10-20%.⁽⁶⁾ Considering the high energy needs, macronutrient intake is a key element in providing essential energy to improve students' nutritional status⁽⁷⁾. According to the Nutritional Adequacy Rate (NAC), adolescent boys between the ages of thirteen and fifteen need 2400 kcal of energy, 70 grams of protein, 80 grams of fat, and 350 grams of carbohydrates, while adolescent girls need 2050 kcal of energy, 65 grams of protein, 70 grams of fat, and 300 grams of carbohydrates⁽⁸⁾. These nutritional needs can be met through a balanced diet that includes staple foods, animal protein sources, vegetable protein sources, vegetables, and fruits consumed every day.

Research conducted by Irwanda et al. (2023) showed that energy intake in adolescents at SMP N 14 Bengkulu City almost part of the energy intake was included in the mild deficit category (30.43%). Most adolescents have a normal protein intake, which is 44.93%. Meanwhile, fat intake was mostly in the excess category, reaching 46.4%. On the other hand, almost all adolescents had a severe deficit in carbohydrate intake, with the percentage reaching 88.41%⁽⁹⁾. This shows that the intake of macronutrients in adolescents has not been fulfilled according to the AKG recommendations, so the fulfillment of a balanced nutritional intake is needed.

At this time, adolescents cannot pick and choose the food they need but tend to choose the food they want. Parents need to ensure that school-age children have a balanced nutritional intake. They should be introduced to a variety of foods so that they can get balanced nutrition⁽¹⁰⁾. Therefore, parents need to provide healthy food to adolescents to fulfill their nutritional needs⁽¹¹⁾. The habit of bringing lunch is common in many cultures around the world. From school children to office workers, bringing lunch is one alternative to ensure a balanced and maintained nutritional intake. Based on this description, the researcher aims to analyze the relationship between the habit of bringing lunch with the level of energy and macronutrient adequacy in students of SMP N 2 East Karawang.

Method

This study is an analytic observational study using a cross-sectional design. This research was conducted at SMPN 2 East Karawang, Karawang Regency on April 29, 2024. The population in this study were all students who attended SMPN 2 East Karawang. The inclusion criteria in this study include 7th-grade students who attend SMPN 2 East Karawang, are present at the time of data collection, and are physically and mentally healthy. The exclusion criteria in this study were students who were not present during data collection, students who were not willing, and students who had a history of illness related to nutritional status.

The sampling technique in this study used a purposive sampling technique and obtained a sample of 35 students. The instrument used in this study was the Food Frequency Questionnaire (FFQ) form with the scoring method never = 0, 2x / month = 5, 1-2x / week = 10, 3-6x / week = 15, 1x / day = 25 which is categorized as often \geq mean research score and rarely < research⁽¹²⁾. Macronutrient intake was obtained through interviews using a 1x24-hour Food Recall form. Subsequently, the nutritional values were calculated using Nutrisurvey software and evaluated for nutritional adequacy based on AKG standards. The results were then categorized as low (< 80% RDA), adequate (80-110% RDA), and high (> 110% RDA).

Data analysis in this study was conducted using SPSS for Windows version 25 statistical software. Univariate analysis was used to evaluate the distribution of the habit of bringing lunch as well as the level of energy and macronutrient adequacy. Meanwhile, bivariate analysis was conducted

to identify the relationship between the independent variable and the dependent variable through the chi-square test.

Results

Data analysis in this study was conducted using SPSS for Windows version 25 statistical software. Univariate analysis was used to evaluate the distribution of the habit of bringing lunch as well as the level of energy and macronutrient adequacy. Meanwhile, bivariate analysis was conducted to identify the relationship between the independent variable and the dependent variable through the chi-square test.

Table 1. Frequency Distribution

Characteristic	(n)	(%)
Gender		
Male	14	40
Female	21	60
Age		
12 years old	3	8,6
13 years old	27	77,1
14 years old	5	14,3
The habit of bringing lunch		
Rarely	20	57,1
Often	15	42,9
Energy		
Low	24	68,6
Adequate	9	25,7
High	2	5,7
Protein		
Low	25	71,4
Adequate	5	14,3
High	5	14,3
Fat		
Low	17	48,6
Adequate	11	31,4
High	7	20,0
Carbohydrate		
Low	24	68,6
Adequate	10	28,5
High	1	2,9
Total	35	100

Table 1 shows that the gender characteristics of male students are dominated by 21 female students with a percentage of 60%. Based on age characteristics, the age of students at SMPN 2 East Karawang is dominated by students aged 13 years as many as 27 students (77.1%). Based on Table 1, it can be seen that most students of SMP N 2 East Karawang have the habit of bringing lunch rarely as many as 20 students (57.1%). Table 1 also shows that the energy adequacy level of most students at SMPN 2 East Karawang has a category of insufficient energy adequacy level of as many as 24 students (68.6%), low protein adequacy level of as many as 25 students (71.4%), low fat adequacy level as many as 17 students (48.6%), and low carbohydrate adequacy level as many as 24 students (68.6%).

The bivariate analysis of this study illustrates the relationship or correlation between the habit of bringing lunch with the adequacy level of energy and macronutrients.

Table 2. Relationship between the habit of bringing lunch and the level of macronutrient adequacy

The habit of bringing lunch	Tingkat Kecukupan Zat Gizi Makro						Total		P-Value
	Low		Adequate		High				
	(n)	%	(n)	%	(n)	%	(n)	%	
Energy									
Rarely	18	51,4	1	2,9	1	2,9	20	57,2	0,003
Often	6	17,1	8	22,8	1	2,9	15	42,8	
Total	24	68,5	9	25,7	2	5,8	35	100	
Protein									
Rarely	15	42,8	3	8,6	2	5,7	20	57,1	0,707
Often	10	28,6	2	5,7	3	8,6	15	42,9	
Total	25	71,4	5	14,3	5	14,3	35	100	
Fat									
Rarely	11	31,5	6	17,1	3	8,6	20	57,2	0,603
Often	6	17,1	5	14,3	4	11,4	15	42,8	
Total	17	48,6	11	31,4	7	20	35	100	
Carbohydrate									
Rarely	17	48,5	3	8,6	0	0	20	57,1	0,037
Often	7	20	7	20	1	2,9	15	42,9	
Total	24	68,5	10	28,6	1	2,9	35	100	

Based on the results of statistical test analysis using chi-square in Table 2, the results showed that there is a significant relationship between the habit of bringing lunch with the level of energy and carbohydrate adequacy in students of SMPN 2 East Karawang with each p-value = 0.003 and p = 0.037, but the results showed that there is no significant relationship between the habit of bringing lunch with the level of protein and fat adequacy in students of SMPN 2 East Karawang with p-value = 0.362 and p = 0.616, respectively.

Discussion

This study shows that 68.6% of the energy adequacy level of SMPN 2 East Karawang students is included in the deficient category with an average intake of 1500.2 kcal. This happens because of the lack of food consumption due to laziness, not having breakfast and eating irregularly. The test results show that there is a significant relationship between the habit of bringing lunch with the level of energy adequacy in students of SMPN 2 East Karawang with a p-value = 0.003. This is in line with similar research conducted by Nurulita & Wirjatmadi (2019) which shows that there are differences in energy adequacy between students who bring lunch and do not bring lunch. Students who bring lunch have a higher energy intake compared to students who do not bring lunch⁽¹³⁾.

The results of Anugraheni & Mulyana (2019) showed that the average energy intake from lunch was 558.7 kcal per day⁽¹⁴⁾. The study also revealed that energy intake from lunch contributed 27.9% to daily energy needs. Bringing healthy and nutritious lunches is very important because it can fulfill around 30% of children's calorie needs⁽¹⁵⁾. By bringing this lunch, parents can control what their children eat. Energy is generated from food consumption through the burning of carbohydrates, proteins, and fats which are then used for activities. Therefore, it is important to consume a balanced diet⁽¹⁶⁾. By bringing lunch, parents can control what their children eat. The energy produced comes from food consumption through the process of burning carbohydrates, proteins, and fats, which are then used for activities. Therefore, it is important to consume a balanced diet⁽¹⁷⁾.

The results of this study showed that there was no significant relationship between the habit of bringing lunch with the level of protein and fat adequacy in students of SMPN 2 East Karawang with a value of p = 0.707 and p = 0.603, respectively. In this case, it can be seen that 71.4% of students'

protein intake is included in the deficient category and 48.6% of students' fat intake is included in the deficient category. This is in line with research conducted by Abdullah et al., (2022) which states that the description of energy, protein, carbohydrate, and fat intake in adolescents is included in the deficient category⁽¹⁸⁾. Despite bringing lunch, often the lunch brought still does not fulfill balanced nutritional intake or B2SA (Diverse, Nutritious, Balanced, and Safe)⁽¹⁹⁾. Therefore, the type of food brought greatly affects the level of nutritional adequacy in students. Based on the survey results, SMPN 2 East Karawang students predominantly bring lunch in the form of staple foods or just snacks, this can be one of the factors that there is no correlation between lunch and the level of protein and fat adequacy of students.

Other studies have shown that protein and fat requirements are largely met through side dishes, both animal and vegetable-sourced, which have been portioned out. However, because food availability in each household varies, likely, that the side dishes provided are not sufficient for students' needs. As a result, the level of protein and fat adequacy of the majority is inadequate⁽²⁰⁾. This is one of the factors that affect the level of protein and fat adequacy, where most students are in the deficient category.

On carbohydrates, this study shows that there is a significant relationship between the habit of bringing lunch with the level of carbohydrate adequacy in students of SMPN 2 East Karawang with a p-value = 0.037. Students with the category of habit of bringing lunch often 50% have an adequate level of carbohydrate adequacy. This is influenced by the type of lunch brought by students that dominantly contains staple foods such as rice. Yurni (2019) in his research shows that the food brought by the subject is rice with fried noodles, fried rice, and rice with animal side dishes, such as fried chicken and omelet. Only 3.8% of participants brought fruit, and 15.4% of participants brought vegetables⁽²¹⁾. This shows that the subject's habit of choosing a balanced menu is still lacking while still fulfilling carbohydrate needs.

Conclusion

The conclusion of this study shows a significant relationship between the habit of bringing lunch and the level of energy and carbohydrate adequacy in students of SMPN 2 East Karawang. However, there was no significant relationship between the habit of bringing lunch and the adequacy level of protein and fat in students at the school. Researchers suggest that the results of this study can be an input for schools to provide counseling and nutrition education on the importance of nutritionally balanced lunches. In addition, it is hoped that there will be efforts to increase maternal awareness in paying attention to children's food intake by providing nutritious lunches so that students' nutritional adequacy levels can be met optimally.

References

- [1] Rinanti OS. Hubungan Asupan Zat Gizi Makro Dan Pengetahuan Gizi Seimbang Dengan Status Gizi Siswa-Siswi Di SMP Muhammadiyah 1 Kartasura. *J Chem Inf Model*. 2015;53(9):1689–99.
- [2] Alpin, Salma WO, Tosepu R. Faktor-Faktor Yang Memengaruhi Kejadian Gizi Buruk Pada Balita Dimasa Pandemi Covid-19 Di Wilayah Kerja Puskesmas Tawanga Kabupaten Konawe Provinsi Sulawesi Tenggara. *J Ilm Obs [Internet]*. 2021;13(2):1–10. Available from: <https://stikes-nhm.e-journal.id/OBJ/index>
- [3] Darwis DY. Konsep Dasar Ilmu Gizi. Pengantar Gizi Masy. 2021;
- [4] Kemenkes RI. Profil Kesehatan Indonesia tahun 2014. Kemenkes RI. Jakarta; 2014.
- [5] Ramadani PD, Maya S, Ernalia Y. Tingkat Kecukupan Energi dan Zat Gizi Makro kaitannya dengan Status Gizi Anak Sekolah Dasar. *J Gizi Kerja dan Produkt*. 2023;4(2):89–97.
- [6] Fauzy MF. GAMBARAN ASUPAN ZAT GIZI MAKRO TERHADAP STATUS GIZI REMAJA DI SMK PARIWISATA KOTA CIREBON. Dr Disertation, Politek Kesehat Tasikmalaya. 2023;
- [7] Andari NMP. HUBUNGAN PENGETAHUAN GIZI DAN KONSUMSI ZAT GIZI MAKRO DENGAN STATUS GIZI SISWA DI SMK KESEHATAN BALI DEWATA DENPASAR. Poltekes Kemenkes Denpasar. 2021;3(2):6.
- [8] AKG. Angka Kecukupan Gizi Yang Dianjurkan Untuk Masyarakat Indonesia. Peratur Kementrian Kesehat Republik Indones Nomor 28 Tahun 2019. 2019;
- [9] Irwanda M, Suryani D, Krisnasary A, Yandrizal. Gambaran Asupan Energi, Zat Gizi Makro dan Status Gizi Remaja di SMP N 14 Kota Bengkulu Tahun 2022. *ASKARA J Ilmu Pendidik Nonform [Internet]*. 2023;09(01):199–208. Available from: <http://ejurnal.pps.ung.ac.id/index.php/Aksara%0AGambaran>
- [10] Adawiyah R, Nurhayati N, Hutabarat F. Hubungan Peran Orang Tua dalam Memenuhi Kebutuhan Gizi Anak dengan Perkembangan Anak Usia Pra Sekolah di TK Negeri Pembina Ampenan. *PrimA J Ilm Ilmu Kesehat*. 2021;7(2):47–54.
- [11] Meliala H, Siagian A, Nasution E. Perilaku Ibu dalam Penyiapan Bekal Makanan dan Sumbangannya terhadap Kecukupan Gizi Anak TK Aisyiyah Busthanul Athfal Tanjung Sari Medan Tahun 2014. *Gizi, Kesehat Reproduksi dan Epidemiol [Internet]*. 2015;1(1):1–6. Available from: <https://jurnal.usu.ac.id/index.php/gkre/article/view/9913/4410>
- [12] Sirajuddin, Surmita, Astuti T. Survey Konsumsi Pangan. 2018. 326–340 p.
- [13] Nurulita CC, Wirjatmadi B. Perbedaan Kecukupan Energi dan Status Gizi Siswa Membawa Bekal dan Tidak Membawa Bekal Ke Sekolah. *Amerta Nutr*. 2019;3(4):305.
- [14] Anugraheni DD, Mulyana B. Kontribusi Bekal Makanan dan Total Energi terhadap Status Gizi pada Anak Sekolah Dasar The Contribution of Packed Lunch and Energy Total to Nutritional Status in Elementary School Students. *Amerta Nutr*. 2019;52–7.
- [15] Insani A. Pemenuhan Asupan Gizi Anak Melalui Bekal Makanan Sehat Bagi Kesehatan Anak Usia Dini. *J Innov Res Knowl*. 2022;2(3):843–8.
- [16] Aulia NR. Peran Pengetahuan Gizi Terhadap Asupan Energi, Status Gizi Dan Sikap Tentang Gizi Remaja. *J Ilm Gizi dan Kesehat*. 2021;2(02):31–5.
- [17] Indraaryani Suryaalamshah I, Kushargina R, Stefani M. “GEREBEK SEKOLAH” (Gerakan Membawa Bekal Makan dan Minum ke Sekolah sebagai Upaya Pemenuhan Gizi Murid SDN Pesanggrahan 02 Jakarta Selatan. *Semin Nas Pengabd Masy LPPM UMJ [Internet]*. 2019;(September 2019):1–6. Available from: <http://jurnal.umj.ac.id/index.php/semnaskat>
- [18] Abdullah, Prima Dewi A, Muharramah A, Rica Pratiwi A. Gambaran Status Gizi dan Asupan Gizi Remaja Santri Pondok Pesantren Shuffah Hizbullah dan Madrasah Al-Fatah Lampung. *J Gizi Aisyah*. 2022;5(1):6–12.

- [19] Indraswari R, Handayani N, Shaluhiah Z, Kusumawati A, Kesehatan BP, Perilaku I, et al. Peningkatan Keterampilan Ibu-ibu dalam Menyajikan Makanan Bergizi Seimbang untuk Anak. *J Public Heal Community Serv* [Internet]. 2023;2(2):89–93. Available from: <https://ejournal2.undip.ac.id/index.php/jphcs/article/view/20932>
- [20] Rokhmah F, Muniroh L, Nindya TS. Hubungan Tingkat Kecukupan Energi Dan Zat Gizi Makro Dengan Status Gizi Siswi Sma Di Pondok Pesantren Al-Izzah Kota Batu. *Media Gizi Indones*. 2017;11(1):94.
- [21] Yurni AF, Sinaga T. Pengaruh Pendidikan Gizi Terhadap Pengetahuan. *Media gizi Indones*. 2019;11(2):183–90.