



Analysis of Nutrition Intake Based on Gender in Adolescents

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Abstract

BACKGROUND: Teenage is one of the important phases in life. At this stage adolescents need adequate nutritional intake to support the growth spurt process.

AIM: The study wanted to see how nutrition is based on gender in the city of Makassar.

METHODS: This research was conducted in one senior high school in Makassar city, the capital city of South Sulawesi Province, Indonesia. The study lasted for 3 months, from July to August 2018. The population in this study was students of class XI and class XII in the 2018–2019 academic year, amounting to 594 people. The sample amounted to 114 students using a sampling technique of systematic random sampling. Characteristics of respondents were collected using a standard questionnaire. The intake data were collected through 24-h food recall and processed using nutrisurvey. All information is then processed using SPSS. This was an observational study with a cross-sectional design. Data were analyzed using univariate analysis.

RESULTS: The majority of respondents in this study were girls adolescent (63.2%), age 16 years (52.6%), normal nutritional status (81.6%), education of fathers and mothers graduating from high school or equivalent (42.1% and 43, 0%), education of self-employed fathers (50%), and employment of mothers are housewives (79.8%), and pocket money of Rp. 10,000–20,000 (50.9%). The study found that male adolescents had a mean higher intake of energy, fat, fiber, vitamin A, vitamin B9, Vitamin B12 and Calcium. Whereas female adolescents have a mean higher intake of protein, vitamin B6, vitamin C, Fe and zinc. But the intake is not significantly different. Based on the adequacy of the 80% rate of nutritional needs, it was found that all adolescents did not meet these standards.

CONCLUSION: Nutritional intake in adolescents in Makassar still does not meet the recommended intake standards and does not differ in all sexes. Macronutrient and micronutrient intake in young men and women still does not meet the recommended nutritional adequacy rate.

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Introduction

Teenage is one of the important phases in life. At this stage, adolescents need adequate nutritional intake to support the growth spurt process. But unfortunately, the intake in adolescents is still far from the recommended figure. A study shows that intake in adolescents, such as energy, carbohydrates, protein, and fat, largely does not meet the recommended nutritional adequacy rate [1].

As a phase prepared to deal with reproduction, teenagers have different nutritional needs based on sex. Young women need iron and folic acid to deal with preconceptions, while young men need zinc to support sperm quality and quality. Total daily food intake is related to sperm morphology. This relationship is largely driven by fat food intake. Fat intake is also associated with progressive low sperm mortality [2]. Sources of protein, consumption time, quantity, and composition are factors that determine the effect of protein preload on long-term food intake in men [3]. There is an inverse relationship between dairy products with low sperm morphology. This is consistent with the hypothesis that

dairy food products contribute to a secular decline in sperm morphology [4]. In boys, the intake of milk and other dairy products is related to prepubertal growth hormone levels, insulin-like growth factor 1 (IGF-1), and IGF1 ratio and IGF-binding protein [5].

In addition, gender turns out to have an influence on food intake, where certain sexes also choose certain foods. Based on the findings of Kiefer, young men consume more energy, fat, and cholesterol, but consume less fiber and carbohydrates than girls. Based on this background, the study wanted to see how nutrition is based on gender in the city of Makassar.

Materials and Methods

This research was conducted in one senior high school in Makassar city, the capital city of South Sulawesi Province, Indonesia. The study lasted for 3 months, from July to August 2018. The population in this study was students of Class XI and Class XII in the

2018-2019 academic year, amounting to 594 people. The sample amounted to 114 students using a sampling technique of systematic random sampling. Data about the characteristics of respondents were collected using a standard questionnaire. The intake data were collected through 24-h food recall and processed using nutrisurvey. All information is then processed using SPSS. This was an observational study with a cross-sectional design. All variables are collected at the same time point. Data were analyzed using univariate analysis.

Results

The study found that male adolescents had a mean higher intake of energy, fat, fiber, Vitamin A, Vitamin B9, Vitamin B12, and calcium, whereas female adolescents have a mean higher intake of protein, Vitamin B6, Vitamin C, Fe, and zinc. However, the intake is not significantly different (Table 1).

Based on the adequacy of the 80% rate of nutritional needs, it was found that all adolescents did not meet these standards (Table 2)

Discussion

To the best of our knowledge, this is the first study to examine gender differences in nutrient intake among adolescents in Indonesia. In this study, it was found that the intake of adolescents in all sexes still did not meet the 80% of the recommended nutritional requirements. This needs to be a concern, considering that adolescents are facing growth spurts and preparing themselves for a preconception period. Inadequate intake will cause adolescents not to grow optimally

This study found that macronutrient and micronutrient intake in adolescent boys and girls still did not meet the recommendations. These results are almost similar to those found by Tanja, who looked at energy, nutrient, and fiber intake in adolescent boys. The

study found that young men consumed macronutrients as recommended but did not consume micronutrients as recommended. The study found that energy intake from carbohydrates, fats, and proteins was still within the acceptable range. While micronutrient intake indicates that 50% of respondents do not consume Vitamin A and Vitamin B6 adequately and 75% of respondents do not consume magnesium, phosphorus, and zinc according to the recommended standards [6].

A study conducted by Farah in Bulaong District found that adolescent eating patterns were generally less varied. The level of adolescent nutrition adequacy is still far from the recommended nutritional adequacy rate. Energy intake from carbohydrate, protein, and fat sources is still very lacking. In India, a study reported that the majority of adolescents reported low intake, more than 30% of respondents did not consume vegetables. In addition, about 70% of respondents consume three or more energy-intensive snacks. Nearly half of the respondents (45%) did not consume fruit and 47% consumed high-energy drinks. In general, girls consume foods that are more nutritious than adolescent boys. Teenage girls consume more cereals, vegetables, fruits, and non-vegetarian food products than boys [7].

For vegetable and fruit consumption, several studies show that young women consume more vegetables and fruits than teenage boys. Although the practice is still far from expectations, teenagers' attitudes and preferences toward the consumption of vegetables and fruits show good results. One study found that attitudes toward fruit and vegetable consumption behavior showed that male respondents who had a good attitude toward fruit and vegetable consumption behavior amounted to 64% and female respondents amounted to 86.7%. Male respondents who had good food preferences for fruit and vegetable behavior were 92% and female adolescents were 95% [8].

Teenagers have an unhealthy diet. A study conducted by Atmarita found that men consume more sugar than women. Men tend to consume more salt than women. Total male fat intake is more than women [9]. Likewise, found by Alkazemi, all teens have an unhealthy diet. However, young women consume potato chips and high-salt and fat snacks and consume sweets more than twice a day [10].

Table 1: Distribution of intake of adolescents by gender

Nutrition intake	Boy				Girl				P
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Energy	1471.7	435.6	381.86	2526.14	1368.3	4.55	504	2687.26	0.237
Protein	55.16	16.36	15.6	93.99	56.07	23.75	16.2	120.16	0.828
Fat	58.22	27.9	11.48	114.92	56.136	32.13	4.41	156.16	0.727
Carbohydrate	179.47	63.1	29	307.96	156.98	58.42	49.81	372.29	0.057
Fiber	6.45	3.2	1.05	14.95	5.88	3.2	0.99	16.42	0.905
Vit A	628.44	1537.6	6.5	7542	338.98	349.58	6.5	2052.85	0.128
Vit B6	0.83	0.368	0.22	1.99	0.87	0.404	0.18	1.93	0.595
Vit B9	114.48	96.097	10.75	534.55	94.48	59.18	21.95	279.8	0.172
Vit B12	0.88	0.636	0.05	2.94	0.82	0.55	0.05	2.58	0.617
Vit C	18.2	25.29	0	147.5	19.74	29.45	0	194.8	0.776
Fe	6.3	3.96	1.6	19.19	6.5	4.33	1.42	19.17	0.802
Zinc	5.58	2.49	1.54	13.56	5.74	2.88	1.83	15.33	0.738
Calcium	261.59	154.69	30	619.26	264.4	192.92	30.25	830.5	0.935

Table 2: Distribution of adolescent intake that meets 80% dietary allowed recommended based on gender

Nutrient Intake	Boy				Girl			
	Sufficient		Insufficient		Sufficient		Insufficient	
	n	%	n	%	N	%	n	%
Energy	2	4.8	40	95.2	13	18.1	59	81.9
Protein	24	57.1	18	42.9	42	58.3	30	41.7
Fat	12	28.6	30	71.4	28	38.9	44	61.1
Carbohydrate	4	9.5	38	90.5	6	8.3	66	91.7
Fiber	0	0	42	100	0	0	72	100
Vit A	8	19	34	81	17	23.6	55	76.4
Vit B6	10	23.8	32	76.2	29	40.3	43	59.7
Vit B9	2	4.8	40	95.2	0	0	72	100
Vit B12	3	7.1	39	92.9	4	5.6	68	94.4
Vit C	1	2.4	41	97.6	3	4.2	69	95.8
Fe	2	4.8	40	95.2	0	0	72	100
Zinc	0	0	42	100	3	4.2	69	95.8
Calcium	0	0	42	100	0	0	72	100

Recommendation

Nutritional intake in adolescents in Makassar still does not meet the recommended intake standards and does not differ in all sexes. Macronutrient and micronutrient intake in young men and women still does not meet the recommended nutritional adequacy rate.

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