

The Relationship of Eating Intake to Thick Fat Soccer Athletes

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Abstract. 66% athletes have not chosen a variety of foods and consume less water, often consume packaged drinks including sweet tea. The importance of athlete's dietary intake correlates with nutritional status, anthropometric profile, and performance. The percentage of excess fat compared to the recommended value was found in groups of male and female athletes. The fulfillment of energy needs, macronutrients micronutrients, and fluid intake of athletes as a whole is still relatively lacking. The purpose of this study was to look the description of the food intake and fat thickness of soccer athletes; Methods: The design used in this study was cross sectional on U-16, U-17, U-18 soccer athletes with a total of 53 soccer athletes from the PS Sleman Development Center. The sampling technique used is purposive sampling. The research instruments used include a 24-hour recall form, a food photo book, and Bioelectrical Impedance Analysis (BIA) tool. The data analysis technique used statistical software through the Chi-Square test; Results: There is no relationship between intake of energy, protein, fat and carbohydrates in percent body fat; Conclusions: Due to the poor intake of energy, protein, fat and carbohydrates for athletes, nutrition education is needed for athletes as the first step in mentoring athletes.

Key words: food intake, percent fat, soccer athletes.

Abstract in Indonesia. 66% atlet belum memilih makanan yang beragam dan kurang mengonsumsi air putih, sering mengonsumsi minuman kemasan termasuk teh manis. Pentingnya asupan makan atlet berkorelasi dengan status gizi, profil antropometri, dan performa. Persen lemak berlebih dibandingkan nilai rekomendasi ditemukan pada kelompok atlet laki-laki maupun perempuan. Pemenuhan kebutuhan energi, zat gizi makro, zat gizi mikro, dan asupan cairan atlet secara keseluruhan masih tergolong kurang. Tujuan dari penelitian ini adalah melihat gambaran asupan makan dan tebal lemak atlet sepak bola. Metode: Desain yang digunakan dalam penelitian ini menggunakan cross sectional pada atlet sepak bola U-16, U-17, dan U-18 dengan jumlah 53 atlet sepak bola PS Sleman Development Center. Teknik sampling yang digunakan secara purposive sampling. Instrumen penelitian yang digunakan meliputi formulir Recall 24 jam, buku foto makanan, dan alat Bioelectrical Impedance Analysis (BIA). Teknik analisis data digunakan software statistik melalui uji Chi-Square; Hasil: Tidak ada hubungan antara asupan energi, protein, lemak dan karbohidrat dengan persen lemak tubuh; Kesimpulan: Dikarenakan asupan energi, protein, lemak dan karbohidrat atlet tidak baik, diperlukan edukasi gizi kepada atlet sebagai langkah awal pendampingan atlet.

Kata Kunci: asupan makan, persen lemak, atlet sepak bola.

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INTRODUCTION

Knowledge about the selection of appropriate food intake in SSB Baturetno athletes is still not appropriate. 66% of athletes have not chosen a diverse diet and consume less water, often consuming packaged drinks including sweet tea (Sari *et al.*, 2018). There was an increase in athletes' knowledge before education (56.67 ± 18.33), after education (75.24 ± 14.70), with a p-value of <0.001 . Nutrition education has been proven effective in increasing athletes' knowledge about balanced nutrition (Puspaningtyas *et al.*, 2019). There was a significant change between the level of knowledge before and after the provision of education to SSB Baturetno football athletes, with a p-value of 0.001 after providing balanced nutrition education and fulfilling fluid intake (Afriani *et al.*, 2021). Athletes who get nutritional intake according to individual characteristics and sports will have sufficient nutrition to improve performance (Ministry of Health, 2021).

The importance of athletes' dietary intake correlates with nutritional status, anthropometric profile, and performance (Pretext *et al.*, 2017). Anthropometric data is a measurement of dimensions and body composition. Periodic anthropometric measurements aim to monitor nutritional status and describe the

adequacy of protein and energy intake (Iqbal *et al.*, 2018). Percent excess fat compared to recommended values was found in both male and female athlete groups. Meeting the needs of energy, macronutrients, micronutrients, and overall athletes' fluid intake is still relatively lacking (Pretext *et al.*, 2019).

Athletes who join the PS Sleman Development Center have never been monitored for nutritional status so it needs to be monitored regularly. The purpose of this study was to look at the picture of food intake and fat thickness of soccer athletes. The existence of data on the dietary intake and fat thickness of soccer athletes is expected to have an impact on athletes and coaches at the PS Sleman Development Center as the first step to contribute to improving athlete performance.

METHODS

The design used in this study used *cross sectional*, data taken at one time to describe the characteristics and relationships between variables. The research was conducted in September–December 2021 in the Sleman field, Yogyakarta.

The population of this study was PS Sleman Development Center football athletes. The respondents of the study were U-16, U-17, and U-18 football athletes with a total of 53 PS Sleman Development Center football athletes. The sampling technique used is *purposive sampling*. The inclusion criteria of this study are athletes who are willing to participate in the research and are registered as athletes of the PS Sleman Development Center. The inclusion criteria were athletes who suffered injuries during the study.

The data taken are primary data, consisting of characteristic data, dietary intake and percent fat thickness in athletes. The research instruments used include a *Food Recall* form to obtain food intake data, a food photo book, and a Bioelectrical Impedance Analysis (BIA) tool to obtain body fat percent data. Food intake data was obtained by interviews using *Food Recall* 1 x 24 hours. Percent body fat was measured using the BIA. The measurement method is to put BIA in a flat place, athletes use minimal clothing, remove footwear, fill in initial data such as age, height, gender, athletes ride with leg positions according to their place, arm positions perpendicular to the body, measurement results appear.

Data collection was carried out directly in the field according to health protocols, namely using masks, *face shields*, *hanscoons*, washing hands with *hand sanitizers* and maintaining distance. Data collection was assisted by enumerators from the Nutrition Study Program of the Sarajan Program and the Nursing Study Program of the Undergraduate Program of the Faculty of Health Sciences, Universitas Respati Yogyakarta. This research has passed the ethical feasibility test of the Health Research Ethics Commission, Faculty of Health Sciences, University of Respati Yogyakarta with number 125.3/FIKER/PL/VII/2021.

Data analysis techniques are used *statistical software* through the Chi-Square test with a 2x2 table. Dietary intake data includes energy, protein, fat, and carbohydrate intake. Athletes' food intake is obtained from the results of *24-hour Food Recall* with the *Nutrisurvey program*. The calculation of daily needs is calculated each response taking into account basal energy, physical activity and exercise correction. Food intake data is categorized into good and bad intake. Good if the intake is between 80-110% of total daily needs, it is not good if it is less than <80% of total daily needs and more than >110% of total daily needs. Body fat percent data is categorized into good and bad intake and categorized based on the value of percent body fat for soccer.

RESULTS AND DISCUSSION

Results and Discussion

Data characteristics of PS Sleman Development Center athletes include age, energy intake, protein intake, fat intake, fat intake and percent body fat. The following is the characteristic data of 53 respondents.

Table 1. Characteristics of PS Sleman Development Center Athletes

Characteristic	Frequency (n)	Percentage (%)
Age		
14-15 Years	14	26.4
16-17 Years	24	45.3
18-19 Years	15	28.3
Total	53	100
Energy Intake		
Bad	45	84.9
Good	8	15.1
Total	53	100
Protein Intake		
Bad	40	75.5
Good	13	24.5
Total	53	100
Fat Intake		
Bad	38	71.7
Good	15	28.3
Total	53	100
Carbohydrate Intake		
Bad	48	90.6
Good	5	9.4
Total	53	100
Percent Body Fat		
Usual	41	77.4
Abnormal	12	22.6
Total	53	100

The age of respondents based on the last calculation of the time of data collection found that most of the age of athletes aged 16-17 years was 24 athletes (45.3%). Most of the 45 athletes (84.9%) had poor energy intake. Most athletes had a poor protein intake of 40 athletes (75.5%). Based on table 1. It is known that most athletes have bad fat intake as many as 38 athletes (71.7%) and bad carbohydrate intake as many as 48 athletes (90.6%). For normal body fat percent as many as 41 athletes (77.4%).

Table 2. The relationship of nutritional intake with body fat percent

Adequacy Level	% Thickness of Body Fat				Total	P	95% CI	
	Usual		Abnormal					
	n	%	n	%	n	%		
Energy								
Bad	36	80.0	9	20.0	45	100	0.361	0.481-11.970
Good	5	62.5	3	37.5	8	100		
Protein								
Bad	32	80.0	8	20.0	40	100	0.459	0.434 –7.280
Good	9	69.2	4	30.8	13	100		
Fat								
Bad	30	78.9	8	21.1	38	100	0.722	0.341-5.447
Good	11	73.3	4	26.7	15	100		
Carbohydrates								
Bad	38	79.2	10	20.8	48	100	0.315	0.371-17.280
Good	3	60.0	2	40.0	5	100		

Based on the Chi-Square test with a p-value of 0.361 so there is no relationship between energy intake and percent body fat. While protein intake and percent body fat with a p-value of 0.459 so there is no relationship between protein intake and percent body fat. Fat intake and body fat percent with a p-value of 0.722 so there is no relationship between fat intake and body fat percent. Protein intake and body fat percent with a p-value of 0.315 so there is no relationship between protein intake and body fat percent.

Discussion

Measurement of the nutritional status of athletes using only body mass index (BMI) is considered lacking. In addition to using BMI, fat percentage is also used as an indicator of athletes' health and fitness. The smaller the athlete's body fat percentage, the higher his fitness. Fat assessment becomes part of the physiological preparation of athletes (Fatmah *et al.*, 2010). Factors that affect the percent of body fat in athletes are genetics, gender, sports, and athlete health. The minimum body weight percentage of male athletes is 5-7%. (Penggali et al., 2019). Assessment of excess fat is part of preparing for athlete performance. The percentage of excess fat is related to athlete performance (Fatmah et al., 2010). Athletes with more fat percentage as many as 8 athletes (15.1%). The percent of normal body fat was 41 athletes (77.4%).

Food Recall 24 hours by digging data on athletes' food intake in a day is done by asking for food and drinks consumed in 24 hours. Questions are asked such as meal schedule, cooking name, food ingredients, processing method and quantity. Then ask again if anything was missed or not. *Food Recall* 24 hours were conducted with interviews regarding food and beverage intake starting in the morning until going to bed at night to measure the one-day meal intake of individuals. If the goal is to know the individual's eating habits, it is not only done with one 24-hour recall because it cannot be interpreted. A minimum of 2 24-hour recalls are required within a certain period of time for this 24-hour recall method to be used (Pretext *et al.*, 2019). In this study, 2 24-hour recalls were not carried out but one 24-hour recall.

Diet affects the physiological adaptations of the athlete's body. Provision of energy (glucose, amino acids, lipids) for exercise. Excessive or underfeeding intake in athletes causes changes in body composition i.e. increase / decrease in body weight, percent body fat and muscle mass (Setiowati *et al.*, 2015). In this study, less energy intake had less effect on the availability of energy for muscle

contraction. One of the results displayed with the BIA tool is the percent of body fat. BIA is easy to carry, safe, easy to use and procedure, and results are quickly obtained. However, it must be considered for gauges with conditions of edema, ascites, dehydration because it will change the resistance and validation of measurements. Factors that affect BIA measurement results are hydration status, recent physical activity, consumption of eating and drinking, air environment, and body position (Iqbal *et al.*, 2018). Percent body fat is the amount of body fat mass in total body weight. In addition to the percent body fat, there was basal energy for each respondent which was then multiplied by the activity factor and exercise correction obtained the overall energy in a day needed. After that it is categorized into good and bad intake (<80% and >110%).

Most of the 45 athletes (84.9%) had poor energy intake. Most athletes had a poor protein intake of 40 athletes (75.5%). Bad fat intake was 38 athletes (71.7%) and bad carbohydrate intake was 48 athletes (90.6%). The intake of energy, protein, fat and carbohydrates in PS Sleman Development Center athletes is not good. This can be because there has never been a monitoring of nutritional status or nutritional education to athletes and related parties. Athletes consume less vegetables, fruits, energy needs that are less than daily needs and consume less fluids according to daily needs. 66% of athletes have not chosen a diverse diet (Sari *et al.*, 2018). There was a significant change between the level of knowledge before and after the provision of education to SSB Baturetno football athletes, with a p-value of 0.001 after the provision of balanced nutrition education (Afriani *et al.*, 2021).

Calorie restriction occurs when athletes reduce body fat or gain weight. Protein needs increase when athletes restrict calories or have low body fat (Helms *et al.*, 2014). Protein can help maintain muscle mass while doing regular exercise. Protein as a substitute for cells damaged by physical exercise and growth substances for adolescent athletes. Increased protein intake balanced with adequate energy intake, energy intake has an impact on muscle mass (Rozenek *et al.*, 2002). When energy intake is lacking, eating protein is broken down as an energy source. Fat in athletes is stored, when not used then used when glycogen stores in the body are not available. While carbohydrates are the main source of energy for athletes. (Pretext *et al.*, 2021). Other studies excess carbohydrate intake, less energy intake then carbohydrate intake is used as the main energy source in the body (Setiowati *et al.*, 2015). If intake is lacking, muscle glycogen and blood glucose do not adequately meet energy requirements for muscle contraction and anaerobic activity (Muray, 2009). The mechanism of food intake is the provision of energy for exercise. Poor food intake (more or less) causes changes in body composition i.e. increase or decrease in body weight, percent body fat and muscle mass (Setiowati *et al.*, 2015)

CONCLUSION

There was no relationship between energy, protein, fat and carbohydrate intake and body fat percent. Because the intake of energy, protein, fat and carbohydrates of athletes is not good, nutritional education is needed for athletes as the first step in assisting athletes.

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