

A Study of Energy Intake and Body Fat Percent of College Students in Seoul

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ABSTRACT

To investigate the correlation between college women's energy intake and body fat percentage, this study was undertaken with 116 college women aged 19–24 years. The subjects were 20.9 years old on the average, and mean height and weight was 161.3cm, 51.2kg. Blood pressures were 112.4mmHg(systolic pressure), 70.2mmHg(diastolic pressure). The number of pulse was 75.5 count/min. The energy intake and percent body fat were examined. The average intake of energy was 1652kcal/day(82.3% of RDA), which was lower than the recommended amount. It was similar to the level of energy intake of Korean women. BMI was 19.7 and body fat percent was 24.4%, so they appeared plump. According to BMI, 43.1% of subjects was grouped into normal, 56.9% was thin; there was no difference between groups in age and stature. Also, normal group(27.1%) showed significantly higher body fat percent(27.1%) than thin group(22.3%). But, body fat percent of thin group according to BMI was shown normal. Therefore, it may be thought that BMI is unsuitable indicator in this study. As a result of analyzing the correlation between body-measuring value and food intake, body fat percent against body weight and BMI was significant at the level $p < 0.001$, but there was no significant correlation with food intake. Therefore, it is desirable to recommend a healthful dietary lifestyle and activities for young women who want to reduce body weight due to excessive concerns regarding their outward figure. (*J Community Nutrition* 2(2) : 105~109, 2000)

KEY WORDS : energy intake · body fat percentage · BMI(body mass index).

Introduction

Today, environmental contamination, stress, lack of exercises and other factors, cause various diseases of adult people. For this reason, there is concern about diets as a way of remedies and preventions. The eating habits of college students not only reflect the dietary life of the past but represent what it would be in the future. There is a tendency to depend upon cheap starchy foods or instant foods with beverages by college students who live in restrictive economic power (Driskell et al. 1979). Also it has been proven that factors related to poor eating behavior among younger people include skipping meals frequent snacking, and food selection and select based on incorrect nutrition knowledge(Jakobovits et al. 1979; Zukerman et al. 1986). As pointed out previous research of college wo-

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men, appearance the excessive reduction of weight and irregular food habits because of interest in outward appearance lead to diseases such as anemia. In some cases, overeating might be problems among college female students.

Obesity is defined as an excessive accumulation of body fat in the whole body(Frances & Eleanor 1997). It is said that its causes are not certain and complicated, but generally genetic factors, endocrine disorders, central nervous disorders and inactive lifestyle and dietary factors contributes to the obesity. Still more, sociocultural factors also affect it.

In modern society, in company with nutritional imbalance derived from overnutrition, rapid development of economy and improvement of a living standard change the phase of diseases to the type of developed nations. Especially the frequency of hypertension is higher than that of developed countries, the mortality of cardiovascular diseases is increasing.

At this time, college women who are responsible for the desirable health of members of society in the future were chosen as the subjects of this study. This

study is accomplished to investigate the relationship between the energy intake and the percent body fat.

Subjects and Methods

1. Subjects

Subjects for this study were 116 female college students from a women's university in Seoul, Korea. The anthropometric measurements and survey were conducted from January through September, 1999.

2. Anthropometric measurements

Anthropometric measurements were composed of height, body weight and body fat. The measurements were performed by Bio-electric Impedance Fatness Analyzer(Tanita TVF202 Japan) at the physiological laboratory. Blood pressure and pulse rate were measured on the brachial artery by digital phymomanometer (Hartman HG160 Digital, Germany).

3. Dietary intakes

Dietary intakes were assessed by the 3-day food record method. Nutrient intakes were analyzed by Computer Aided Nutritional analysis program for professionals(CAN-pro 1997).

4. Statistical analysis

Collected data were statistically analyzed by SAS PC package. All data were expressed as mean±S.D. Statistically significant differences were accepted at $p < 0.05$. The correlation between energy intake and related factors, such as body fat, total cholesterol, energy yielding nutrients was obtained by Pearson's Correlation Coefficient.

Results

1. General characteristics and anthropometric measurements

The subjects in this study were 19 to 24 years of age, and average age was 20.9 years. The average height was 161.3cm, and the average pulse(count/minute) was 75.5 ± 9.1 . Compared with Korean adult standard stature, the average pulse was normal. The systolic blood pressure was 112.4 ± 10.4 mmHg, and the diastolic blood pressure 70.2 ± 6.7 mmHg which were normal.

The mean weight of subjects, 51.2 ± 4.3 kg, tends to be lower than of the standard weight, 53kg of Korean adult standard stature(Table 1).

2. Energy intake by BMI

Subjects for this study were 116 college women, the range of energy intake was 715.0–3820.0kcal and the standard deviation was 503.6kcal. In consequence of investigating food intake of subjects was lower (1668.2kcal) compared with the Korean RDA. Percentage of energy intake compared with RDA according to age and body weight was 85.9%. Energy intake of subjects was lower than the RDA, and, it is necessary to approach about extreme deficiency and excess because the range of energy intake was from 35.3% to 176.4%.

3. Anthropometry by BMI

BMI was 19.7 and body fat percent was 24.4%, so they were appeared plump(Table 3). According to BMI criteria, 43.1% of subject was normal, 56.9% was thin group, there was no differences between groups in age and stature. But normal group(27.1%) was significantly higher than thin group(22.3%) in body fat percent. Also, body fat percent according to BMI was normal, body fat percent of thin group was shown normally. Therefore, it may be thought that BMI is unsuitable indicator in this study.

4. Correlation between energy intake and percent body fat

There was no significant correlation between energy intake and percent body fat that was analyzed by Pearson's correlation test. According to the result of correlation between body-measuring value and food intake, body fat percent against body weight and BMI was significant at $p < 0.001$, but there was no significant correlation with food intake. Table 4. The correlation

Table 1. General characteristics of college women

Variables	Mean±S.D	Normal value
Age	20.9± 1.1	20–29
Height	161.3± 4.7	160
Weight	51.2± 4.3	53
Blood pressure(mmHg)		
Systolic	112.4±10.5	<135
Diastolic	70.2± 6.7	< 85
Pulse frequency(count/min)	75.5± 9.1	70

Table 2. Energy intake by BMI

N=116	Mean±S.D	Normal(n=50)	Thin(n=66)	t value
Energy(kcal)	1668.2±503.6	1704.2±621.3	1640.9±400.6	NS
Energy intake by RDA(%) ¹⁾	85.9± 25.1	82.0± 28.6	88.8± 22.1	NS
Protein of energy intake(%)	18.2± 8.3	19.5± 10.8	17.2± 5.7	NS
Lipid of energy intake(%)	24.7± 5.2	23.5± 6.6	25.6± 3.8	NS
Carbohydrate of energy intake(%)	57.1± 9.1	57.0± 11.9	57.2± 6.3	NS

$$\text{Energy intake percent against RDA} = \frac{\text{energy intake of subjects(kcal)}}{\text{individual recommended energy intake according to age and body weight}} \times 100$$

Table 3. Anthropometry by BMI

N=116	Mean±S.D	Normal(N=50)	Thin(N=66)	t value
Age(yrs)	20.9±1.1	21.2±1.3	20.6±0.9	NS
Height(cm)	161.3±4.7	160.2±3.9	162.0±5.1	NS
Weight(kg)	51.2±4.3	54.4±2.5	48.7±3.7	p<0.001
BMI	19.7±1.6	21.2±0.8	18.5±1.0	p<0.001
Body fat percent(%)	24.4±4.1	27.1±3.2	22.3±3.4	p<0.001

Table 4. Correlation between energy intake and anthropometry

	Height	Weight	BMI	Body fat percent	Energy	Carbohydrate	Protein percent	Lipid percent
Height								
Weight	0.387***							
BMI	-0.304	0.759***						
Body fat percent	-0.109	0.595***	0.682***					
Energy	0.066	0.147	0.109	0.025				
Energy intake percent ¹⁾	-0.042	-0.141	-0.111	0.135	0.955***			
Protein percent ²⁾	0.119	0.112	0.026	0.028	0.4684***	0.425***		
Lipid percent ³⁾	-0.168	-0.243	-0.126	-0.013	-0.160	-0.076	-0.158	
Carbohydrate percent ⁴⁾	-0.012	0.037	0.049	-0.019	-0.336**	-0.344**	-0.821***	-0.433***

Pearson Correlation Coefficients

** : p<0.01, *** : p<0.001

1) Energy intake percent(%)

3) Lipid intake percent of energy intake(%)

2) Protein intake percent of energy intake(%)

4) Carbohydrate intake percent of energy intake(%)

between body-measuring value and food intake.

Discussion

In the results of this study, energy intake was lower than that of Korean RDA. It was revealed that college women might be in fear of obesity(Moon & Kim, 1992) which is related to undesirable dietary habits as undertaken previously in college women(Kang & Jung 1995 ; Kim & Lee 1996). In addition, it was reported that the subjects consumed lower energy than that of Korean RDA in the nutritional survey(Lee et al. 1988 ; Lee et al. 1988) for Korean college women.

According to the Korean National Nutrition Survey (1990), the intake of energy has gradually decreased. According to the Korean Institute for Health and So-

cial Affairs, during the past five years, Korean adult's energy intake was 90% extent of RDA on the basis of the people whose activity level was moderate. This could be interpreted that Korean people were deficient in energy compared with the RDA, but it was attributed to the lack of activities caused by environmental change, which was lower standard as compared with its middle activity(39kcal/kg) and also it was almost coincide with necessity(34kcal/kg) for light activity.

Recently the social view of beauty was distorted(Ryu 1997 ; Won 1995), so excessive decrease of food intake has appeared for the purpose of fitness(Sung 1996). The adolescent's strong desire to lose weight was accompanied with anemia, growth retardation as well as anorexia nervosa, psychological disorders and disgust with foods(Hinton & Eppright 1993). Especially in the

case of young women who will be having a baby, it is important to note that a mother's nutritional status before pregnancy directly affect on the fetus(Kim 1995 ; Kim 1977 ; Lee 1978). Therefore, it might be useful to take countermeasures to prevent the excessive reduction of body weight among young women. Ninety-five percents of Korean college women had normal body weight but 85% of them were not satisfied with their figure (Baily 1989). There has been a study reported by Baily in which the adolescent group controlled body weight with diets. In Korea, 57.4%(Park et al. 1997) and 78.5%(Kim et al. 1997) of college women made an attempt to reduce body weight. If we consider lots of them to be under normal weight, it was well documented that college women have an excessive concern to achieve a slim figure.

As shown in Table 3, the body weight of the subjects in this study was in the normal range but it was indicated that 48% that body fat content was 23% and above, these figures several reports that fende students had a trial of weight reduction and control for their slender figure.

When weight reduction is attempted as only diet restriction without any exercises, body fat might be increased by yo-yo phenomenon.

Summary and Conclusion

This study was designed to investigate the energy intake and percent age of body fat of college women, the subjects of this were 116 college women. By assessing of dietary intakes, body fat and blood analysis, the results were obtained as follows :

1) The subjects were an average of 20.9 years old, 161.3cm tall, and weight 50.1kg. Blood pressures were 112.4mmHg(systolic pressure), 70.2mmHg(diastolic pressure). The pulse was 75.5 count/min.

2) The intake of energy was 1668.2kcal/day, which was lower than that of the recommended amount.

3) The average body fat percent was 24.4%, so they appeared plump. According to BMI criteria, 43.1% of subject was normal, 56.9% was categorized into thin group. There was no difference between groups in age and stature. But normal group(27.1%) was significantly higher than thin group(22.3%) in body fat percent. Also,

body fat percent according to BMI was normal, body fat percent of thin group was shown normal.

4) No significant correlation was found between energy intake and body fat content.

In this thesis, the energy intake of college women was 82.3% of RDA. The energy intake was lower than that of the RDA, whereas the content of body fat was high. Therefore, it is necessary for college women to encourage desirable eating habits and activities, to change in perception and recognition for health.

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