Correlation between BMI and Physical Fitness
of College Women in Seoul[*]

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ABSTRACT

This study investigated the correlation of the physical measurements and the basic physical fitness of 158 female students in the city of Seoul. The average age of the subjects was 22.0 ± 0.13 years old, the average height was 160.9 ± 0.7cm and the average weight was 53.4 ± 0.6kg. The mean BMI(Body Mass Index) was 20.7 ± 0.2kg/m^2. The average muscle mass was 36.5 ± 0.3 and the average body fat percentage was 28.0 ± 0.4%. The basic fitness levels of the subjects were measured based on the evaluation chart of the Korea Health and Science Research Institution (1994). The subjects were divided into 3 groups based on BMI(Group I : BMI < 20, Group II : $20 \leq$ BMI < 25, Group III : BMI $\geq$ 25) and the correlation between BMI and physical fitness was assessed. 1) The muscle strength of the subjects was measured by their grip strength, among other tests. Groups 1 and 2 were evaluated as "su"(level 1) and group 3 was "woo"(level 2). 2) Endurance 1 was tested by push-ups, and while groups 1 and 2 were evaluated as "su" (level 1), group 3 was "ga"(level 5). This result did not suggest any significant relevance among the subjects. 3) Endurance 2 was tested by sit-ups ; groups 1 and 2 were evaluated as "mi"(level 3) and group 3 as "yang"(level 4). Group 2 and group 3 showed a significant difference. 4) Instant power was tested by standing high jumps, and although there was a significant difference between group 1 and group 3, all of the subjects were evaluated as "ga"(level 5). 5) Flexibility was measured by how far the subjects could bend forward. There was no significant relevance between the groups and they were all respectively evaluated as "woo"(level 2). 6) Agility was tested with side-steps and all the subjects showed poor agility as "yang"(level 4). 7) Heart and lung endurance was tested by the step test, calculating the maximum oxygen intake with the Physical Energy Index(PEI) and using the numbers according to the evaluation chart. Group 1 was evaluated as "mi"(level 3) and groups 2 and 3 were "woo"(level 2). From these results, we could see the group III(obese group) had a tendency of lower levels in all the variables related to body fitness They showed significantly lower endurance assessed with time for sit-ups and instant power by the standing high jumps. (*J Community Nutrition* 5(1) : 29~36, 2003)

KEY WORDS : obesity · physical fitness · college women · BMI(Body Mass Index).

Introduction

The rapid changes of today's society brought along a change in our lifestyles and as the standard of living has increased, our tables have become abundant with richer food.

However this extra energy converts into fat and then accumulates as body fat. If this sort of routine continues, it could end up in obesity(Bray 1979). Although there are various causes of obesity such as environmental pollution, stress, and lack of exercise, overeating combined with lack of exercise is considered to be the main cause according to most scientists(Na et al. 2001). Simple obesity caused by overeating and lack of exercise makes up 95% of the people suffering from obesity(Kim 1990), without cause from hereditary illness, endocrine disorders, or neurotic disabilities (Kim 1990). Science of disease prevention and health improvement are crucial matters in our society and obesity is becoming a big issue For example, heart related diseases

recently came up as a major cause of death among Koreans. As a chronic degenerative disease, it was reported to be the number one cause of death since the 1970's (Huh 1990). In 1990, 29.9% of the total number of deaths were caused by heart related diseases (Kim 1993). Obesity is especially seen as a direct cause of heart related diseases, since it increases blood circulation and cardiac output, provoking hypertrophy of the heart, heart expansion, high blood pressure, and coronary artery disease. As symptoms of high cholesterol levels, high contents of fat in the blood, decrease in HDL-cholesterol, high blood sugar, and high blood pressure are caused by obesity, it is becoming dangerous to increases in heart and blood related diseases. Like this, obesity, directly or indirectly, causes heart and blood related diseases. Research has shown that the level of obesity related to the seriousness of heart and blood disease leads to an increase in disease related deaths. On the other hand, lack of exercise from sophisticated material civilization development and mechanization and automation, the rate of obesity, high blood pressure, and coronal heart disease is steadily rising, while the age level of patients is falling. The level of obesity affects physical strength along with speed, agility, muscle strength, and stamina (Ko 1998). Physical strength is a synthetic body strength with which human-beings need to efficiently live under the various circumstances of the environment, endure stimulation, and maintain and develop as a life form. It is also an action capability to act and move energetically (Hettinger 1953). Recent studies have shown that continuous aerobic exercise can help obese people lose weight and body fat (Choi, Kang 2000 Sung et al. 2001) and that this is closely related to total daily energy consumption rather than daily food intake. Though it was not a big problem in the past, obesity is rapidly becoming a dangerous illness, and it is a problem that we must conquer for the general well being of our country. Maintaining a normal body weight lets our bodies act normally and efficiently, and also effects our mental well being as well. Obesity can occur at any age, but most cases of obesity start to show in the early years of school during puberty (Kang et al. 1998). Signs of obesity in these stages continue to adulthood and have been proven to result in a high danger of geriatric diseases. Therefore, it would be safe to say that in the early years of college, which marks the beginning of adulthood, it is important to control obesity and to strive to keep physically fit. Especially, female university students, in which our future of dietary life lies,

need a life with a balance of diet and exercise to increase physical strength. We will now observe the obesity rate of female students and how that is related to their physical strength.

Subjects and Methods

1. Subjects

We surveyed 158 female students at two separate universities in the city of Seoul. This survey was carried out and researched from April 2001 to March 2002. The subjects were divided into 3 groups based on BMI (Group I BMI < 20, Group II 20 BMI < 25, Group III BMI 25) and the correlation between BMI and physical fitness was assessed.

2. Methods

1) Measuring height and weight

Wearing light clothing, the subject stands comfortably barefooted with eyes leveled on a Jenix Automatic Height and Weight Measuring Instrument (Dongsan Jenix Co.) Height was measured up to the unit of 0.1cm and weight to the unit of 0.1kg.

2) Measuring body fat

Using Inbody Mass (Biospace Co. Ltd.), we measured the muscle mass, body fat mass, body fat content, and abdominal fat content of the subjects.

3) Measuring physical strength

The basic physical strength of the subjects was measured by a professional from the National Physical Center. They were tested on their muscle strength, endurance, agility, flexibility, and heart and lung endurance. We tested their muscle strength by measuring their grasping power, endurance by press-ups and sit-ups, instant power by the standing high jump, flexibility by bending at the waist, agility by side-steps, and heart and lung endurance by the step test.

4) Additional survey

We asked the subjects to fill out a survey asking questions about their age, monthly spending, personal health conditions or problems, regular exercise habits, smoking habits, caffeine intake, average daily meal frequency, breakfast habits and preferences on certain types of food including fast food, meat, vegetables, fruits, and sweets.

Table 1. Survey of general questions

Variables		Total	Group 1[1]	Group 2	Group 3	χ^2-test
Age(years)		22.0 ± 0.13[2]				
Monthly spending	< 15	17(12.1)[3]	4(23.5)[4]	11(64.7)	2(11.8)	
(10^4 Won)	15- 19	36(25.5)	13(36.1)	21(58.3)	2(5.6)	
	20- 24	24(17.0)	8(33.3)	14(58.3)	2(8.3)	NS
	25- 29	33(23.4)	20(60.6)	12(36.4)	1(3.0)	
	30- 50	31(22.0)	11(35.5)	19(61.3)	1(3.2)	
Health status	Very good	8(5.6)	1(12.5)	5(62.5)	2(25.0)	
	Good	44(31.0)	16(36.4)	24(54.5)	4(9.1)	12.605**[5]
	Normal	78(54.9)	36(46.2)	41(52.6)	1(1.3)	
	Bad	12(8.5)	3(25.0)	8(66.7)	1(8.3)	
Health problems	Fatigue	35(28.7)	15(42.9)	19(54.3)	1(2.9)	
	Gastro-intestinal trouble	20(16.4)	9(45.0)	10(50.0)	1(5.0)	
	Overweight	14(11.5)	3(21.4)	9(64.3)	2(14.3)	
	Headache	13(10.7)	6(46.2)	6(46.2)	1(7.7)	
	Constipation	13(10.7)	6(46.2)	7(53.8)	0	NS
	Anaemia	11(9.0)	6(45.5)	5(45.5)	1(4.5)	
	Menstrual cramps	10(8.2)	5(50.0)	5(50.0)	0	
	Insomnia	3(2.5)	0	3(100)	0	
	etc	3(2.5)	2(66.7)	1(33.3)	0	
Exercise	Yes	24(16.8)	7(29.2)	15(62.5)	2(8.3)	NS
	No	119(83.2)	51(42.9)	62(52.1)	6(5.0)	
Drinking	Yes	52(36.1)	22(42.3)	24(50.0)	4(7.7)	NS
	No	92(63.9)	36(39.1)	52(56.5)	4(4.3)	
Smoking	Yes	4(2.8)	4(100)	0	0	NS
	No	138(97.2)	52(37.7)	78(56.5)	8(5.8)	
Coffee drinking	Yes	88(61.1)	34(38.6)	48(54.5)	2(6.8)	NS
	No	55(38.9)	24(43.6)	29(52.7)	2(3.6)	
Frequencies of	1time	1(0.7)	1(100)	0	0	
meal intake	2time	61(42.7)	27(44.3)	33(54.1)	1(1.6)	
	3time	80(55.9)	30(37.5)	43(53.8)	7(8.8)	NS
	4time	0	0	0	0	
	> 4time	1(0.7)	0	1(100)	0	
Breakfast	Yes	86(59.7)	34(39.5)	46(53.5)	6(7.0)	NS
	No	58(40.3)	24(41.4)	32(55.2)	2(3.4)	
Fast food	Yes	93(65.0)	39(41.9)	48(51.6)	6(6.5)	NS
	No	50(35.0)	18(36.0)	30(60.0)	2(4.0)	
Meat	Yes	74(48.4)	27(36.5)	43(58.1)	4(5.4)	NS
	No	79(51.6)	34(43.0)	39(49.4)	6(7.6)	
Fruit	Yes	138(96.5)	55(39.9)	75(54.3)	8(5.8)	NS
	No	5(3.5)	3(60.0)	2(40.0)	0	
Sweets	Like	13(9.0)	5(38.5)	8(61.5)	0	
	A Lot	51(35.4)	22(43.0)	28(54.9)	1(2.0)	NS
	So so	70(48.6)	27(38.6)	36(51.4)	7(10.0)	
	Dislike	10(7.0)	4(40.0)	6(60.0)	0	
Frequencies of	0time	17(11.9)	7(41.0)	10(58.8)	0	
calcium intake	1time	99(69.2)	35(35.4)	59(59.6)	5(5.1)	
	2time	14(9.8)	7(50.0)	4(28.6)	3(21.4)	16.628**
	3time	9(6.3)	7(77.8)	2(22.2)	0	
	> 3time	4(2.8)	1(25.0)	3(75.0)	0	

1) Group 1 BMI< 20, Group 2 20 BMI< 25, Group 3 BMI 25　　　　2) Mean SE
3) N(% among the total number of subjects)　　　　4) N(% among the number of subjects in the group)
5) ** p< 0.01

3. Statistical analysis

We have used the SPSS/PC + V10.0 package program in analyzing the surveyed statistics. For their general descriptions we used the χ^2-test to calculate their answer frequency and percentage, and we also analyzed the significant relevances between them. We have analyzed their weight, height, BMI, and body fat with statistics of average standard error. The ANOVA test with a standard $p = 0.05$ was used for the verification of significant relevance between the basic fitness level measurements among the subjects in each group, and we have analyzed the relations between the physical measurements and basic fitness levels with Pearson's correlation.

Results and Discussion

1. General subject details

The general details of the subjects are shown in Table 1 and the average age was 22.0 ± 0.13 years old. A monthly spending of "150,000 - 200,000 won" was the most general amount with 36.1% of the subjects, and those spending less than 150,000 won was 12.1%. When we asked them about how they evaluated their own health, 54.9% of them answered "normal," and many of them also answered "good" with 31.0%. And to this item, the relation between the groups according to BMI levels showed a significant relevance at a $p < 0.05$ level. As for health problems, fatigue was the most common problem at 28.7%, and gastroenteric trouble, excess weight, headaches, constipation, anaemia, menstrual cramps, and insomnia came after that in that order. Only 16.8% of the subjects answered "yes" to the question of whether they were getting regular exercise. 53.6% of the subjects said that they drank alcohol and 2.8% of them were smokers. On their daily average meal frequency, many of them answered three times a day at 55.9% and those saying once a day and over

four times a day was 0.7% each. When asking them if they regularly had breakfast, 59.7% answered that they did. Asking them on their food preference, fast food, meat, and vegetarian meals resulted in 64.5%, 51.7%, and 95.8%, showing there might be a problem according to the subjects' preferences of fast food and meat. When we asked their preference of sweets, 48.6% answered "Just OK", and 35.4% answered "A lot", showing that most of them enjoyed sweet foods. When asking them about their daily calcium intake, most of them said more than once a day and 11% answered that they didn't. This item showed significant differences between the groups $(p < 0.05)$.

2. Physical measurements

The average height, weight, BMI, and body fat content of the subjects are shown in Table 2. The average height of the college students was at 160.9 ± 0.7cm, which is lower than the 163.1 ± 3.9cm of the research on exercise ability of college women (Kim et al. 2000) and the average weight was 53.4 ± 0.6kg. The Body Mass Index (BMI) is determined on the basis of previous research. With Asians (WHO 2000), over 23kg/m^2 is over-weight, and 25kg/m^2 is considered as obese, whereas in the case of Westerners (WHO 1997), 30kg/m^2 is the dividing figure. According to these figures, the average of the subjects was at 20.7 ± 0.2kg/m^2 therefore, all could be categorized as normal. Their average muscle content was 36.5 ± 0.3 and their body fat content was 28.0 ± 0.4%, so by the research that defined obese as having a body fat content of 30 - 35% (Deurenberg et al. 1998), they were all normal. If we take a look at the physical measurements of the two groups divided by their BMI levels, the height seems to get lower towards group 3, and the BMI average of each group measured at 18.4(kg/m^2) for group 1 and 21.7(kg/m^2) and 26.6(kg/m^2) for groups 2 and 3. As for muscle content, it seemed to be increasing as we went

Table 2. Results of physical measurement

Variables	Total	Group 1[1]	Group 2	Group 3
Height (cm)	160.9 ± 0.7[2]	162.1 ± 0.5	160.3 ± 4.3	157.5 ± 2.2
Weight (Kg)	53.4 ± 0.6	48.3 ± 0.9	48.3 ± 0.9	65.9 ± 5.7
BMI (kg/m^2)	20.7 ± 0.2	18.4 ± 0.3	21.7 ± 0.3	26.6 ± 0.4
Muscle mass (kg)	36.5 ± 0.3	34.8 ± 0.4	37.4 ± 0.5	39.6 ± 1.3
Fat mass (kg)	15.3 ± 0.3	12.2 ± 0.3	16.5 ± 0.3	24.0 ± 0.8
Body Fat (%)	28.0 ± 0.4	24.4 ± 0.6	30.0 ± 0.6	36.4 ± 1.0
Fat distribution	0.8 ± 0.0005	0.77 ± 0.001	0.81 ± 0.003	0.88 ± 0.001
Physical growth score	75.8 ± 0.4	72.3 ± 0.6	78.4 ± 0.5	76.9 ± 0.8

1) Group 1 BMI < 20, Group 2 20 ≤ BMI < 25, Group 3 BMI ≥ 25   2) Mean ± S.E.

Table 3. Results of basic physical fitness measurements

Variables	Total	Group 1[1]	Group 2	Group 3
Grip strength(kg)	38.4 ± 1.3[2]	40.1 ± 2.1	38.2 ± 1.8	32.4 ± 4.9
Push-up(times)	15.6 ± 1.1	15.9 ± 1.6	16.1 ± 1.7	8.3 ± 2.3
Sit-up(min/times)	25.9 ± 0.8	25.0 ± 1.4[ab]	27.3 ± 1.0[b]	19.5 ± 3.4[a]
Instant power(cm)	27.0 ± 0.6	28.4 ± 1.1[b]	26.6 ± 0.7[ab]	23.0 ± 2.3[a]
Flexibility(cm)	14.1 ± 1.0	14.4 ± 1.5	14.0 ± 1.4	11.9 ± 1.3
Side-step(time)	31.9 ± 0.6	32.1 ± 1.1	32.1 ± 0.7	29.6 ± 2.1
Step test(PEI[3])	140.4 ± 53.8	85.6 ± 1.3	87.7 ± 1.1	86.4 ± 2.6

1) Group 1 BMI< 20, Group 2 20 BMI< 25, Group 3 BMI 25
2) Mean ± SE

3) $PEI = \dfrac{300 \text{ sec}}{\text{Total of the pulse frequency } (2 \times 3 \text{ times})} \times 100$

from group 1 to 3. The results for body fat content were shown at 24.3% for group 1, 30% for group 2, and 36.4% for group 3. The results for abdominal fat content were 0.77 for group 1 and 0.81 and 0.88 for groups 2 and 3. Lastly, the measurements of physical growth rates were highest with group 2 at 78.4 units, with group 3 coming next.

3. Basic physical strength of the subjects

The basic physical strength of the subjects is shown in Table 3. This has been evaluated based on the statistical information of the Korean Physical Science Research Institute(1994).

1) Muscle strength is determined by the amount of strength one can use with their muscles and our subjects were evaluated by their grip strength among other tests. Groups 1 and 2 were categorized as "su"(level 1) and group 3 was "woo"(level 2). This shows a higher strength compared to research done on obese women in their twenties(Na et al. 2001), which resulted in "mi"(level 3).

2) The endurance 1 levels of the subjects were measured by push-ups and groups 1 and 2 were "su"(level 1), while group 3 was "ga"(level 5). This result showed no significant relevance among the subjects.

3) The endurance 2 levels were measured by sit-ups and groups 1 and 2 were "mi"(level 3), while group 3 was "yang"(level 4). And groups 2 and 3 showed significant differences. But comparing these results to a research done on obese women, which resulted with "mi"(level 3)(Na et al. 2001), it shows that they had a stronger endurance level than our group 3.

4) Instant power is determined by how much power one can use in the shortest span of time, which means the amount of work that can be done in a unit of time. That is why we used the standing high jump to evaluate the subjects for this,

which showed significant differences between groups 1 and 3. But the overall evaluation of the subjects turned out to be "ga"(level 5).

5) Flexibility is generally determined by the movement span of articular body parts or the growth ability of articular areas. This measurement of fitness has an important role in physical exercise and movement and has a great effect on preventing injuries from exercise. We evaluated our subjects by measuring how far they could bend their bodies forward, and there was no significant relation among the groups as they all resulted formidably with "woo"(level 2). This showed the same result as the research between obesity and flexibility(Ko et al. 1998), which concluded with no real relation between the two. But there is also a study that shows that people have less flexibility according to their obesity (Lee 1998).

6) Agility is the ableness of one's body to react fluently and control the body with swift movements, and is also related to how fast a certain body part or whole body can change movement and react or switch directions during motion. We used side-steps to evaluate the subjects. All the groups were evaluated as "yang"(level 4), which is lower than the result of research done on obese women(Na et al. 2001) that showed "mi"(level 3). Therefore, most of the subjects in this survey were generally low in their agility.

7) We used the step test for the measurement of heart and lung endurance, calculating the maximum oxygen intake with the Physical Energy Index(PEI) and using the numbers according to the evaluation chart. Group 1 was evaluated as "mi"(level 3) and groups 2 and 3 were each evaluated as "woo"(level 2), but this result was opposite to that of the research which showed that obese women have lower heart and lung endurance(Sung et al. 2001).

Table 4. The correlation between the basic physical fitness and physical measurements of the subjects

	Weight	Height	BMI	Physical measurement	Fat mass	% Body fat	Fat distribution	Grip strength	Push-up	Sit-up	Instant power	Flexibility	Side-step	Step test
Weight														
Height	.224**													
BMI	.903***	-.213**												
Physical measurement	.555***	.478***	.350***											
Fat mass	.714***	-.075	.757***	.394***										
% Body Fat	.506***	-.239**	.620***	.129	.863***									
Fat distribution	.323***	-.267**	.444***	.106	.489***	.437***								
Grip strength	-.033	.077	-.068	-.002	-.081	-.043	-.111							
Push-up	-.223**	.156	-.154	-.097	-.193	-.154	-.171	.417***						
Sit-up	.046	.056	.021	.0159	-.095	-.123	-.112	.311***	.266**					
Instant power	-.138	.092	-.202	.013	-.302**	-.394***	-.309***	.159	.067	-.030				
Flexibility	.028	-.012	.039	.056	-.014	-.060	-.061	.360***	.349***	.209**	.054			
Side-step	-.063	.030	-.077	-.074	-.038	.021	-.076	.646***	.255**	.310***	.046	.201**		
Step test	.013	-.051	.040	-.039	.055	.078	.080	-.065	.124	-.039	.081	-.080	.044	
Physical growth score	.297***	-.134	.353***	.578***	.168*	-.041	.198**	-.005	.156	.317***	.173	.129	-.100	-.018

* p＜0.05, ** p＜0.01, *** p＜0.001

4. The relevance between physical body measurements and basic fitness measurements

Body fat content and agility were negatively related（p＜0.001）, which shows that the more body fat content, the less agility（Table 4）. Muscle strength and endurance 1 and 2 are very closely related to each other（p＜0.001）and flexibility and agility also showed significant relation with muscle strength（p＜0.001）. This tells us that when muscle strength grows, endurance grows with it. Also comparing flexibility with agility, we can see that if someone is very flexible, that person is very agile as well. Among the physical measurements, body mass index has a positive relation with these results, and especially has a correlation with muscle content. In other words, a high body mass index does not mean a high content of body fat, but a high content of muscle. Although there is no significant relation between physical growth and body fat content, it is because it has negative relation with them. According to the body fat percentage standard（Park et al. 2002）, in the case of women 13% is thin, 13 - 23% is normal, 24 - 28% is slightly overweight, 28 - 32% is overweight, and over 33% is obese. Group 1 was determined by their BMI, which showed they were thin, but their body fat percentage averaged at 24.4%, which is "slightly overweight". This result shows that even if someone looks thin by appearance, there is a possibility of them having a high body fat percentage, which could later increase the dangers of many geriatric diseases such as heart and blood disease. There is also research on the lowering of body fat percentage by 6 months of endurance related exercise（Schwartz et al. 1991）.

Summary and Conclusion

The average age of the subjects was 22.0 ± 0.13 years old and the average height was 160.9 ± 0.7cm, which is shorter than the 163.1 ± 3.9cm of the research on the exercise abilities of college women（Kim et al. 2000）, and the average weight was 53.4 ± 0.6kg. As for the body mass index（BMI）, with Asians（WHO 2000）, more than 23kg/m^2 is over-weight, and 25kg/m^2 is considered as obese, whereas in the case of Westerners（WHO 1997）, 30kg/m^2 is the dividing figure. According to these figures, the average of the subjects was at 20.7 ± 0.2kg/m^2, therefore, all could be categorized as normal. The average muscle mass was 36.5 ± 0.3, and the average body fat percentage was at 28.0 ± 0.4%, so accor-

ding to the research that defined a 30 - 35% of body fat percentage as obese(Deurenberg et al. 1998), they were all normal. The basic fitness levels of the subjects were measured based on the evaluation chart of the Korea Health and Science Research Institution(1994).

1) The muscle strength of the subjects was measured by their grip strength, among other tests. Groups 1 and 2 were evaluated as "su"(level 1) and group 3 was "woo"(level 2).

2) Endurance 1 was tested by push-ups, and while groups 1 and 2 were evaluated as "su"(level 1), group 3 was "ga"(level 5). This result did not suggest any significant relevance among the subjects.

3) Endurance 2 was tested by sit-ups and groups 1 and 2 were evaluated as "mi"(level 3) and group 3 as "yang"(level 4). Group 2 and group 3 showed significant differences.

4) Instant power was tested by standing high jumps, and although there was a significant difference between group 1 and group 3, all of the subjects were evaluated as "ga"(level 5).

5) Flexibility was measured by how far the subjects could bend forward and there was no significant relevance between the groups, and they were all respectively evaluated as "woo"(level 2).

6) Agility was tested with side-steps and all the subjects showed poor agility as "yang"(level 4).

7) Heart and lung endurance was tested by the step test, calculating the maximum oxygen intake with the Physical Energy Index(PEI) and using the numbers according to the evaluation chart. Group 1 was evaluated as "mi"(level 3) and groups 2 and 3 were "woo"(level 2).

It was shown that the group III(obese group) had the tendency of lower levels in all the variables related to body fitness. They showed significantly lower endurance assessed with time for sit-ups and instant power evaluated with the standing high jumps. From these results, we also could see that the average strength of the subjects was relatively low, although their BMI was low, their body fat percentage was high. Obesity is a disease that comes from nutritional conditions and can occur in any stage of life(Kaug et al. 1988). Also there are reports stating that obesity during puberty has a high chance of continuing into adulthood(Huse et al. 1982). So, it is safe to say that maintaining a healthy weight and physical condition as a college student, which is the start of adulthood, is most important above all things(Kim et al. 1997). The modern college women may look thin by appearance, but there is a possibility of them having a high body fat percentage, which could later increase the dangers of many geriatric diseases such as heart and blood disease.

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