

A Study of Weight Control Attempt, Psychosocial Status, Nutrition Behavior and Related Factors among Female University Students*

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ABSTRACT

This study was designed to examine psychosocial status and nutritional factors(nutritional knowledge, dietary attitudes, eating behavior, dietary intakes) among female university students and to investigate if there were differences in these variables by weight loss attempt. A cross-sectional survey was conducted to 225 female university students in Seoul. Survey instrument was adapted or modified based on literature review, and dietary intakes were assessed using 24-hour recall and CAN-pro. Descriptive statistics, t-test, χ^2 -test were used in data analysis. Mean height, weight of subjects were 162.7cm, 51.3kg, and mean BMI was 19.4. One hundred-nine students(48.4%) were grouped into weight loss attempt group and 116 students were grouped into non-attempt group. According to BMI, 58.7% of weight loss attempt group were underweight, suggesting that unnecessary weight control is common in college women. With respect to psychosocial status, subjects received moderate degree of stress and were slightly satisfied with life. There was no significant difference in stress, social support or self-esteem between the two groups, however, students in non-attempt group were more satisfied with their life($p < 0.01$) and adapted better in school than students in weight loss attempt group. Subjects scored 14.9 ± 2.1 (highest score : 20) on nutritional knowledge, and showed favorable dietary attitudes. Overall, nutritional knowledge and dietary attitudes were not significantly different between the two groups. Common eating problems were irregular meals(71.6%), followed by unbalanced meals and eating-out. Subjects in weight loss attempt group were more likely to change eating habit after entering the university and showed more undesirable eating habit. Dietary intake data indicated that the energy derived from fat was slightly higher than the recommended level. Most of the nutrient intake was lower than the RDA, particularly, iron and calcium intake was below the 50% of the RDA. Although this study did not reveal significant difference in nutritional knowledge or dietary intake by weight loss attempt, this study showed status of weight control, eating habit and dietary intake in female university students, and provide some information for nutrition education of college women. (*Korean J Community Nutrition* 1(2) : 108~118, 1999)

KEY WORDS : weight control, nutritional knowledge, attitudes, eating behavior, dietary intakes, psychosocial status, female university students.

Introduction

It is well established that several factors, including nutritional factors and psychosocial status, have a major influence on health. Accordingly, it is important for university students to develop desirable eating behavior and maintain optimum health physically and mentally, because health-related behaviors will continue to a later life. Many university students, however, neither put value on health nor pay much attention to factors influencing

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health. Particularly, female university students are more vulnerable to poor health. Numerous studies consistently revealed that diets of college women are deficient in nutrients such as calories, calcium, iron and vitamin A(Kim 1997 ; Oh et al. 1996 ; Son & Sung 1998 ; Sung 1997).

College women also have a strong desire for thinness and show a greater interest in body image(Kim et al. 1998 ; Park et al. 1997 ; Won 1998). In addition, societal norms for a thinner figure put pressure on women to unnecessarily attempt to control weight. Seymour et al. (1997) raised concern for methods in weight control used by young women. Young women have commonly relied on weight control methods such as skipping meals, overexercising and use of laxatives or diuretics. The practice of unnecessary weight control is also frequently reported among college women in Korea(Kim et al. 1998 ; Park et al. 1997).

It is expected that factors influencing health (e.g., psychosocial status, nutritional factors) might be different between those who try weight control and those who do not. The purpose of this study was to assess weight control attempt, psychosocial status, and nutritional factors including nutritional knowledge, dietary attitudes, eating habit and dietary intakes among female university students, and to investigate if there were differences in psychosocial status and nutritional factors by weight control status. The findings from this study will provide baseline information for developing nutrition education program for female university students.

Subjects and Methods

1. Subjects

This cross-sectional study was conducted during November and December, 1998. The survey instrument was constructed through a literary review (Lee 1993; Lee 1996), and pilot-tested twice for wording, and understanding of items. The final questionnaire was administered to 225 female students of a university in Seoul following the direction of a trained investigator.

2. Measurement

The survey instruments included scales to measure demographics, obesity index, status of weight control, psychosocial status, and nutritional variables such as nutritional knowledge, dietary attitudes, eating habit and dietary intakes.

Obesity index was assessed by two methods: Percent ideal body weight (PIBW) and BMI. Ideal body weight was calculated by the modified Broca method and obesity index was estimated based on the previous reports (Guo et al. 1994; Himes & Dietz 1994; Kim 1990). The status of weight control was assessed by asking if subjects try to control (lose/maintain/gain) weight or do not try, methods of weight loss, and reasons for weight loss (Kim et al. 1998). In data analysis, those who try to lose weight were categorized into weight loss attempt group, and the rest of subjects were grouped into non-attempt group.

Several dimensions of psychosocial status were investigated including perceived stress, social support, life satisfaction and self-esteem. These variables were adapted or modified through a literary review (Chai et al. 1995; Lee 1996).

Stress was measured using 'Global Assessment of Recent Stress Scale', developed by Won et al. (1985). This scale was composed of 8 items which were designed to measure the stress while adapting to college life. Each item was written using 10-point scales, therefore, values of stress score could range from 8 to 80, with higher scores indicating more stress (Chronbach's $\alpha=0.80$). Social support was measured on a 5-point scale by asking to indicate the degree of support received by significant others. Life satisfaction was rated on a 7-point scale by indicating the degree of happiness in one's life (Nam et al. 1995). Self-esteem was measured using the scale composed of 10 items (Lee 1996) which was rated on 4-point scales (Chronbach's $\alpha=0.53$). The higher the score on self-esteem, the more one has self-esteem.

Scale for measuring nutritional knowledge included 20 items for assessing nutrient needs, function of food groups, food habit and weight loss, based on the research of Kim & Lee (1996) and Kim et al. (1998). For each item, degree of accuracy and perceived knowledge were examined as follows:

- degree of accuracy =
$$\frac{\text{number of 'correct' answers} \times 100}{\text{number of items marked on 'correct' or 'wrong'}}$$
- degree of perception =
$$\frac{\text{number of items marked on 'correct' or 'wrong'} \times 100}{\text{total number of items}}$$

Dietary attitudes were measured using a scale composed of 11 items (Kim & Lee 1996). The scale included such items as perceived importance of nutrition in food selection or consumption, attitudes toward processed food or eating-out, interest in food consumption, interest in nutrition and health, attitude toward avoiding salty food, and so on. Each item was rated on a 3-point scale of 'always' (1) to 'not at all' (3), and overall score could range from 11 to 33, with higher score indicating more favorable dietary attitudes.

To examine the status of eating behavior, problems and changes in eating habit, use of nutrition/health supplement, those who eat together, behaviors at meals, and frequency of skipping meals were assessed by using questions in previous studies (Kim & Lee 1996; Kim et al. 1997; Park et al. 1997). Dietary intakes were assessed using 24-hour recall method. A trained investigator ex-

plained how to keep record for 24-hour recall and showed the portion sizes of food, in order to collect information more accurately. Nutrient intakes were analyzed by the Computer Aided Nutritional Analysis Program for Professionals(CAN-Pro 1997).

3. Statistical analysis

Data were analyzed using the Statistical Analysis System(SAS). Descriptive statistics were used to examine the distribution of study variables. To investigate the difference of study variables by weight loss attempt, a *t*-test or χ^2 -test was used(Cody & Smith 1991).

Results and Discussion

1. General characteristics of subjects

General characteristics of subjects are presented in Table 1. The mean age of subjects was 20.4 ± 1.9 years. The mean height and weight were 162.7cm, and 51.3kg respectively. These were similar to the Korean standard for females aged 20–24 years(162cm, 52kg). The mean body mass index was $19.4(\text{kg}/\text{m}^2)$, which was below the normal range. About two-thirds of subjects were cate-

gorized into the underweight group by BMI. This result raises the concern for and may suggest slight undernutrition, as previously reported by Park et al.(1997). About half of the subjects were freshmen(49.8%) and enrolled in natural science(47.6%).

As weight control was found to be the most important and interesting topic in nutrition among female university students in the previous study(Kim & Kim 1999), subjects were examined by weight control status(Table 2). Students who were trying to lose weight were 48.4%($n=109$) and they were categorized into the "weight loss attempt" group. Approximately fifty-two percent of the subjects were those who neither do anything for weight loss nor try to gain or maintain weight, and they were categorized into the "non-attempt" group. Among those who were trying to lose weight, the commonly used methods were diet control(34.9%) and exercise(25.7%). The reason for trying weight loss was mainly to have better appearance(84.4%), while health maintenance accounts for only 11.9%.

When general characteristics were compared by weight loss attempt, most of these variables were not significantly different by the attempt of weight loss, except body

Table 1. General characteristics of subjects

		Total ($n=225$)	Weight loss	
			Attempt group ($n=109$)	Non-attempt group ($n=116$)
Age		20.4 ± 1.9^1	20.4 ± 1.8	20.4 ± 2.0
Height(cm)		162.7 ± 4.7	162.7 ± 4.4	162.8 ± 5.1
Weight(kg)***		51.3 ± 5.0	52.9 ± 4.4	49.9 ± 5.2
BMI(kg/m^2)***		19.4 ± 1.7	20.0 ± 1.4	18.8 ± 1.7
Pocket money(10,000 won)		24.1 ± 10.2	24.8 ± 11.0	23.4 ± 9.4
Major	Liberal art	52(23.1) ²	25(22.9)	27(23.3)
	Social science	54(24.0)	24(22.0)	30(25.9)
	Natural science	107(47.6)	56(51.4)	51(44.0)
	Art	12(5.3)	4(3.7)	8(6.9)
School year	Freshman	112(49.8)	51(46.8)	61(52.6)
	Sophomore	34(15.1)	19(17.4)	15(12.9)
	Junior	45(20.0)	23(21.1)	22(19.0)
	Senior	34(15.1)	16(14.7)	18(15.5)
Obesity index ^{3)**}	Too lean	35(15.6)	10(9.2)	25(21.6)
	Underweight	85(37.8)	37(33.9)	48(41.4)
	Normal	105(46.7)	60(55.1)	43(37.1)
BMI ^{4)**}	Underweight	154(68.4)	64(58.7)	90(77.6)
	Normal	71(31.6)	45(44.3)	26(22.4)

*** $p < 0.001$, ** $p < 0.01$

1) mean \pm SD

2) n(%)

3) Estimation of obesity index ; Too lean : $OI \leq -20$, Underweight : $-20 < OI \leq -10$, Normal : $-10 < OI \leq 10$

4) Estimation of BMI Underweight : $BMI \leq 20$, Normal : $20 < BMI < 25$

weight, obesity index, and BMI (Table 1). The body weight and BMI was significantly higher in the "weight loss attempt" group ($p < 0.001$), showing 52.9kg, 20.0 for this group while the "non-attempt" group had a mean value of 49.9kg for body weight and 18.8 of BMI.

Further analysis of obesity index and BMI showed that a higher percentage of subjects were categorized into "underweight" or "too lean" (Table 1). This pattern was more serious in non-attempt group than in weight loss attempt group ($p < 0.01$), showing 41.4% of the former

group being underweight and 21.6% being too lean. According to BMI, 68.4% were underweight and only 31.6% were categorized into normal weight. Similarly, the percentage of underweight subjects was higher in non-attempt group (77.6%) than in attempt group (58.7%, $p < 0.01$). In addition, 58.7% of weight loss attempters were underweight, suggesting that unnecessary weight loss practices are common among young adult women. Strong preoccupation with thinness leads to inappropriate eating behavior and eating disorders (Moses et al. 1989). Misconception regarding beauty and thinness might also play a role in eating behavior, therefore, young adult women must establish a healthy perception of ideal body weight.

Table 2. Status of weight control attempt

		n(%)
<u>Status of weight control (n=225)</u>		
None		41(18.2)
Try to gain weight		7(3.1)
Try to maintain current weight		37(16.4)
No special effort to loss weight		31(13.8)
Try to loss weight		109(48.4)
<u>Subjects who tried to loss weight (n=109)</u>		
Method of weight loss	No special method	37(33.9)
	Diet	38(34.9)
	Exercise	28(25.7)
	Others	6(5.5)
Reason of weight loss	To maintain current health	13(11.9)
	To have better appearance	92(84.4)
	Feeling fat	4(3.7)

2. Psychosocial status

With respect to psychosocial status, we examined stress, social support, life satisfaction, self-esteem, and findings that are displayed in Table 3.

Most of the subjects (89.3%) felt that they got stressed in daily life. The average stress scores was 44.0 indicating that subjects received a moderate degree of stress. Although weight loss attempt group had more stress than non-attempt group, the difference was not statistically significant. When the domains of stress more carefully examined, the relationship with family (mean stress score : 4.

Table 3. Psychosocial status by weight loss attempt

	Total (n=225)	Weight loss	
		Attempt group (n=109)	Non-attempt group (n=116)
<u>Get stressed in daily life</u>			
Yes	201(89.3) ¹⁾	100(91.7)	101(87.1)
No	24(10.3)	9(8.3)	15(12.9)
<u>Stress of each domains</u>			
Adaptation to school*	6.8±2.1 ²⁾	7.0±2.1	6.5±2.1
Relationship with Friends	4.5±2.3	4.8±2.4	4.5±2.1
Self-reliance/judgement	6.1±2.4	6.1±2.6	6.1±2.2
Family relationship	4.0±2.3	3.9±2.4	4.1±2.2
Problems in physical health	4.8±2.4	5.0±2.5	4.5±2.2
Personality/attitudes towards life	5.0±2.1	5.2±2.3	4.8±2.0
Capacity of study for major	6.2±2.2	6.4±2.3	6.1±2.1
Self-consciousness of stress	6.6±2.0	6.7±2.0	6.4±2.0
<u>Sum of stress score^{4)†}</u>			
	44.0±11.2	45.2±11.6	42.9±10.8
Social support ⁵⁾	4.1±0.7	4.1±0.7	4.1±0.7
Life satisfaction ^{6)**}	4.5±1.1	4.3±1.2	4.6±1.0
Sum of self-esteem scores ⁷⁾	27.2±0.9	27.0±0.9	27.3±2.0

* $p < 0.05$, ** $p < 0.01$

1) n(%)

2) mean ± SD

3) possible score for each domain of stress : 1-10 (The higher points indicate more stress in each domain.)

4) possible score : 8-80 (The higher points indicate more stress.)

5) possible score : 1-5 (The higher points indicate more support.)

6) possible score: 1-7 (The higher points indicate more satisfaction with life.)

7) possible score : 10-40 (The higher points indicate higher self-esteem.)

0), or with friends (mean stress score : 4.5) was relatively adequate. On the other hand, subjects felt stressed by school work, such as adaptation to school or capacity of study for major. Adaptation to school was the only domain that showed a difference between the two groups. Weight loss attempters felt more stressed in adaptation to school than non-attempters ($p < 0.05$). Stress reflects one's weakness or inadequacy (Won & Kim 1985), and the present study is consistent with the previous finding that college students feel a significant degree of stress while adapting to college life (Lee 1996).

Mean score of social support was 4.1 (possible score : 1-5), suggesting that they received considerable support from parents or friends. The mean score on life satisfaction was 4.5 (possible score : 1-7). Subjects in weight loss attempt group were significantly different from those in non-attempt group for life satisfaction ($p < 0.01$). The mean score for self-esteem was 27.2, which was somewhat lower than that reported in the previous study (Lee 1996). However, there was no significant difference between the two groups. Garner & Garfinkel (1979) reported that those who tried excessive weight loss scored lower on self-esteem, however, this study did not show such a trend.

3. Nutritional knowledge and dietary attitudes

Subjects scored 14.9 out of 20 on a nutritional knowledge scale and had a moderate level of knowledge. Although the mean score for nutritional knowledge was higher in weight loss attempt group, the difference was not statistically significant. The accuracy of nutritional knowledge was 80.2%, and perception of knowledge was 93.0%. These values are higher than reported by Kim & Lee (1996). When these values were compared by weight loss attempt, those who were trying to lose weight scored higher on perception of knowledge (94.5%) than those who were not (91.8%, $p < 0.05$). This suggests that weight loss attempters are sensitive to the information on food or energy expenditure and they are more likely to be exposed to such information (Garner & Garfinkel 1979). This finding is also similar to the report that weight loss attempters scored higher on nutritional knowledge than the counterparts (Won 1998). Among the individual items of nutritional knowledge, two groups showed difference only in the item, 'If you skip breakfast and then have large lunch and dinner, it will be fine.' 97.3% of weight loss attempt group while 88.9% of non-attempt group answered cor-

rectly on that item (Table 4).

The score on dietary attitude marked 23.8 out of 33 (Table 5). Subjects showed more positive attitudes than previously reported by Kim et al. (1996). Dietary attitudes were not significantly different between the two groups. Only the item, 'I would really like to change my eating habit', showed statistical difference ($p < 0.05$), however, the score was similar between the two groups.

4. Eating behavior and dietary intakes

Problems and changes in eating habits are presented in Table 6. Subjects pointed out irregular meals (71.6%) as the most serious problem in eating habit, followed by unbalanced meals (13.3%), eating-out (7.6%), and skipping meals (6.7%). These results are consistent with findings from the focus group interview (Kim & Kim 1999), and previous studies (Hong et al. 1993 ; Kim et al. 1997 ; Kim & Lee 1996 ; Koszewski & Kuo 1996). Problems with eating habits were not different by attempt of weight loss. The majority of students do not use nutrition and health supplements ; 18.7% answered they use supplements occasionally.

About a third of subjects answered that their eating habits have been changed since they entered the university (Table 6). The percentage of those who changed eating habits after entering university was higher in weight loss attempt group (43.1%) than in non-attempt group (27.6%, $p < 0.05$). Common changes included having irregular meals (36.7%), skipping meals (15.2%), eating-out (12.7%), and decreased amount of meals (6.3%). Major reasons for changes in eating habit were change in life pattern (32.9%), having irregular meals (24.1%), and lack of time (15.2%). A previous study similarly reported that time constraints or irregular lifestyle as the major obstacle for healthy eating (Kim & Kim 1999).

Eating behaviors at each meal were also examined (Table 7). For breakfast, 44.7% ate with family members while 43.7% ate alone. Most subjects (84.7%) ate lunch with friends ; They usually have dinner with family members (42.7%) or friends (35.6%). This finding showed that they have lunch or dinner with someone else, however, it is common to eat breakfast alone. Behaviors while eating, such as watching TV or reading books/newspaper were also pointed out as the problem at breakfast or at dinner. It takes 14 to 21 minutes to eat meals, indicating that they have meals in a relatively short time. Those who eat break-

Table 4. Nutrition knowledge by weight loss attempt

	Weight control														
	Total(n=225)					Attempt group(n=109)					Non-attempt group(n=116)				
	wrong	correct	don't know	wrong	correct	don't know	wrong	correct	don't know	wrong	correct	don't know	wrong	correct	don't know
Recommended dietary allowance of energy for female college student is 2000 kcal.	68(30.2)	103(45.8) ¹⁾	54(24.0)	38(36.9)	49(45.0)	22(20.2)	30(25.9)	54(46.6)	32(27.6)						
Skipping meal is not harmful for health because our body contains some nutrients.	33(14.9)	186(82.7)	6(2.7)	18(16.5)	89(81.7)	2(1.8)	15(12.9)	97(83.6)	4(3.5)						
Cooked rice, bread and noodle are carbohydrate-rich food.	6(2.7)	218(96.9)	5(0.4)	2(1.8)	107(98.2)	0(0.0)	4(3.5)	111(95.7)	1(0.9)						
We can maintain our health without eating fat.	25(11.1)	189(84.0)	11(4.9)	12(11.0)	91(83.5)	6(5.5)	13(11.2)	98(84.5)	5(4.3)						
It is desirable to lose 0.5-1kg per week during body weight control.	69(30.7)	113(50.2)	43(19.1)	37(33.9)	54(50.0)	18(16.5)	32(27.6)	59(50.9)	25(21.6)						
Meals composed of bibimbap, Kimchee and milk are more nutritionally balanced than meals composed of gomilang, cooked rice and Kimchee.	48(21.3)	140(62.2)	37(16.4)	25(22.9)	66(60.6)	18(16.5)	23(19.8)	74(63.8)	19(16.4)						
Water is not essential for our body.	4(1.8)	214(95.1)	7(3.1)	1(0.9)	105(96.3)	3(2.8)	3(2.6)	109(94.0)	4(3.5)						
There is no need of taking dietary fiber, because it is not nutritious.	7(3.1)	215(95.6)	3(1.3)	2(1.8)	106(97.3)	1(0.9)	5(4.3)	109(94.0)	2(1.7)						
Organic food or natural food is excellent in nutrition.	158(70.2)	47(20.9)	20(8.9)	80(73.4)	22(20.2)	7(6.4)	78(67.2)	25(21.6)	13(11.2)						
Cholesterol is essential for body.	54(24.0)	145(64.4)	26(11.6)	27(24.8)	73(67.0)	9(8.3)	27(23.3)	72(62.1)	17(14.7)						
Animal fat is better for health than vegetable oil.	20(8.9)	194(86.2)	1(0.4)	9(8.3)	97(89.0)	3(2.8)	11(9.5)	97(83.6)	8(6.9)						
Milk, milk products and small fishes are source of calcium.	9(4.0)	215(95.6)	11(4.9)	3(2.8)	105(96.3)	1(0.9)	6(5.2)	110(94.8)	0(0.0)						
Bean, bean products are protein foods, such as meals, fishes etc..	3(1.3)	219(97.3)	3(1.3)	1(0.9)	108(99.1)	0(0.0)	2(1.7)	111(95.7)	3(2.6)						
Carbohydrate and fat are nutrients for energy and power.	11(4.9)	206(91.6)	8(3.6)	5(4.6)	103(94.5)	1(0.9)	6(5.2)	103(88.8)	7(6.0)						
Osteopathy or osteoporosis is caused by deficiency of calcium.	213(94.7)	5(2.2)	7(3.1)	106(97.3)	2(1.8)	1(0.9)	107(92.2)	3(2.6)	6(5.2)						
If you skip breakfast and then you have large lunch and dinner, it will be fine.*	9(4.0)	209(92.9)	7(3.1)	1(0.9)	106(97.3)	2(1.8)	8(6.9)	103(88.9)	5(4.3)						
Deficiency of iron source foods, such as liver, vegetables, egg yolk etc. is leads to anemia.	28(10.4)	176(78.2)	21(9.3)	12(11.0)	87(79.8)	10(9.2)	16(13.8)	89(76.7)	11(9.5)						
Protein is nutrient for the formation of body tissue (ex. muscle, blood).	11(4.9)	203(90.2)	11(4.9)	5(4.6)	10(91.7)	4(3.7)	6(5.2)	103(88.8)	7(6.0)						
Egg has a high cholesterol content.	43(19.1)	158(70.2)	24(10.7)	20(18.4)	8(84.3)	8(7.3)	23(19.8)	77(66.4)	16(13.8)						
If you ate one food as you like sufficiently, supply plentifully nutrients for health maintenance and growth.	12(5.3)	204(90.7)	9(4.0)	8(7.3)	97(89.0)	4(3.5)	4(3.5)	107(92.2)	5(4.3)						
Total score	14.9±2.1 ²⁾	15.1±2.0						14.8±2.2							
Degree of perception(%)	93.0±8.0	94.5±6.8						91.8±9.1							
Degree of accuracy(%)	80.2±9.2	80.0±9.3						80.4±9.1							

*p<0.05
1) n(%)
2) mean±SD(range 0 - 20)

fast everyday were less than a third of subjects. As found in an other study(Chang & Kim 1999), skipping lunch was less common than skipping breakfast or dinner. Subjects in weight loss attempt group were more likely to skip meals than those in non-attempt group, thus posing a nutritional concern for them.

To identify any problems in dietary intakes, a 24-hour recall was performed for 172 students out of 220 students. Dietary intakes were analyzed using the CAN-pro program.

Among 172 students, were 82(47.7%) weight loss attempters and were 90(52.3%) nonattempters. Study results

Table 5. Dietary attitudes by weight loss attempt

	Total (n=225)	Weight loss		t-value
		Attempt group (n=109)	Non-attempt group(n=116)	
Eating a lot of food that I want is more important than nutrition. ²⁾	2.0±0.5 ¹⁾	2.0±0.6	1.9±0.5	1.4
I eat whatever I want.	1.9±0.6	1.9±0.6	1.8±0.6	1.4
Price of food is more important than nutrition.	2.2±0.6	2.2±0.6	2.2±0.6	0.8
I am always interested in what I am going to.	1.8±0.6	2.3±0.6	2.1±0.6	1.6
I am willing to use instant foods when I am busy.	1.9±0.5	1.9±0.5	1.9±0.5	0.2
If I take vitamin pill, I don't have to worry about my health.	2.7±0.6	2.7±0.6	2.6±0.6	1.3
I would really like to change my eating habit.	2.1±0.6	2.0±0.6	2.1±0.6	-2.3*
If possible, I would like to eat out.	2.4±0.6	2.3±0.6	2.4±0.6	-0.7
I am interested in information on nutrition and health.	2.1±0.6	2.0±0.6	1.9±0.6	1.0
I am not satisfied with meals.	2.6±0.6	2.6±0.5	2.6±0.6	0.4
I always take care not to take salt.	2.2±0.7	1.8±0.8	1.8±0.6	0.1
Total score of dietary attitudes ³⁾	23.8±2.6	23.8±2.7	23.5±2.3	1.1

*p<0.05

1) mean±SD

2) Each item could range from 1-3. The higher the score, the better each dietary attitude is

3) Total score could range from 11-33. The higher the score, the better dietary attitudes are

Table 6. Problem and change of eating habit by weight loss attempt

		Total (n=225)	Weight loss	
			Attempt group (n=109)	Non-attempt group(n=116)
Problem of eating habit	Irregular meals	161(71.6) ¹⁾	78(71.6)	83(71.6)
	Unbalanced meals	30(13.3)	13(11.9)	17(14.7)
	Eating-out	17(7.6)	11(10.1)	6(5.2)
	Missing meals	15(6.7)	6(5.5)	9(11.8)
	No	2(0.9)	1(0.9)	1(0.9)
Nutrition and health supplements/ vitamin supplements	Yes	15(6.7)	8(7.3)	7(6.0)
	Occasionally	42(18.7)	23(21.1)	19(16.4)
	No	168(74.7)	78(71.6)	90(77.6)
Change in eating habit after entrance of university*	Yes	79(35.1)	47(43.1)	32(27.6)
	No	146(64.9)	62(56.9)	84(72.4)
Change in eating habit ²⁾	Irregular meals	29(36.7)	14(29.8)	15(46.9)
	Missing meals	12(15.2)	6(12.8)	6(18.8)
	Eating-out	10(12.7)	5(10.6)	5(15.6)
	Decreased amount of meals	5(6.3)	3(6.4)	2(6.3)
	Others	23(29.0)	19(40.4)	4(12.5)
Reasons of eating habit change ²⁾	Irregular meals	19(24.1)	10(21.3)	9(28.1)
	Eating-out	7(8.9)	5(10.6)	2(6.3)
	Change in life pattern	26(32.9)	16(34.0)	10(31.3)
	Lack of time	12(15.2)	6(12.8)	6(18.8)
	Others	15(19.0)	10(21.3)	5(15.6)

*p<0.05

1) n(%)

2) For this item, total group n=79 (weight loss attempters n=47 ; non-attempters n=32)

Table 7. Eating behaviors at each meal by weight loss attempt

	Breakfast				Lunch				Dinner			
	Total (n=225)	Attempt group (n=109)	Non-attempt group (n=116)	χ^2	Total (n=225)	Attempt group (n=109)	Non-attempt group (n=116)	χ^2	Total (n=225)	Attempt group (n=109)	Non-attempt group (n=116)	χ^2
<u>Meal partner</u>												
Alone	87(43.7) ¹⁾	44(46.3)	43(41.4)		24(10.7)	13(11.9)	11(9.5)		34(15.1)	16(14.7)	18(15.5)	
With family	89(44.7)	38(40.0)	51(49.0)	1.9	9(4.0)	5(4.6)	4(3.5)	1.5	96(42.7)	41(37.6)	55(47.4)	3.8
With friend	23(11.1)	13(13.7)	10(9.6)		191(84.7)	91(83.5)	100(86.2)		80(35.6)	42(38.5)	38(32.8)	
Meeting	0(0.0)	0(0.0)	0(0.0)		1(0.0)	0(0.0)	1(0.0)		15(6.7)	10(9.2)	5(4.3)	
<u>Behavior with meal</u>												
Eat only	109(54.8)	49(51.0)	61(58.7)		48(21.3)	21(19.3)	27(23.3)		40(17.8)	17(15.6)	23(19.8)	
Read book or newspaper	13(6.5)	11(11.5)	2(1.9)	9.1*	5(2.2)	4(3.7)	1(0.9)	3.3	9(4.0)	7(6.4)	2(1.7)	0.2
Watch on TV	40(20.1)	16(16.7)	24(23.1)		9(4.0)	3(2.8)	6(5.2)		76(33.8)	33(30.3)	43(37.1)	
Talking	37(18.6)	20(20.8)	17(16.4)		163(72.4)	81(74.3)	82(70.7)		100(44.4)	52(47.6)	48(41.4)	
<u>Hunger before meal</u>												
No	71(35.7)	31(32.3)	41(39.4)		34(15.1)	20(18.4)	14(12.1)		31(13.8)	20(18.4)	11(9.5)	
Little hungry	106(53.3)	54(56.3)	52(50.0)	1.1	132(58.7)	58(53.2)	74(63.8)	2.9	143(63.6)	65(60.0)	78(67.2)	3.8
Very hungry	22(11.1)	11(11.5)	11(10.6)		59(26.2)	31(28.4)	28(24.1)		51(22.7)	24(22.0)	27(23.3)	
Spend time of meal	13.9±7.2 ²⁾	14.0±7.1	13.8±7.3	0.8	19.4±9.9	19.4±8.6	19.4±9.5	0.8	21.5±11.1	21.6±11.3	21.4±10.9	0.9
<u>Frequency of skipping meal</u>												
Skip everyday	17(8.5)	24(22.0)	15(13.0)		5(2.2)	2(1.8)	3(2.6)		3(1.3)	2(1.8)	1(0.9)	
4 - 6 skip per week	24(12.1)	9(8.3)	16(13.8)	4.4	7(3.1)	4(3.7)	3(2.6)	0.8	10(4.4)	8(7.3)	2(1.7)	5.4*
1 - 3 skip per week	101(50.8)	49(45.0)	53(45.7)		94(41.8)	48(44.0)	46(39.7)		96(42.7)	48(44.1)	48(41.4)	
<1 skip per week	57(28.6)	27(24.8)	32(27.6)		119(52.9)	55(50.5)	64(55.2)		11(51.6)	51(46.8)	65(56.0)	

*p<0.05

1) n(%)

2) mean±SD

indicate that most of nutrient intake did not reach the Korean RDA(Korean Dietetic Association 1995). The energy derived from carbohydrate : protein : fat was 59.4 : 15.7 : 24.9(Table 8). Compared to the recommended ratio, the energy derived from carbohydrates was slightly low while energy from fat was slightly high. The pattern of high fat intake was also reported by Kim(1995). The energy ratio was not different by the weight loss attempt status.

The mean daily energy intake was 1480.1kcal, which was only 71.4% of the RDA(Table 9). The mean protein intake was 57.9g, while iron and calcium intakes were 8.0mg, 361.6mg, respectively. Examining dietary intake data by the weight loss attempt, it was found that most nutrient intakes were not significantly different by weight loss attempt status. However, there was a tendency that the intakes of some nutrients, including iron, phosphorus, calcium and fiber was higher in non-attempt group than in weight loss attempt group.

When comparing dietary intakes to the RDA, most nu-

trient intakes were below the RDA, except vitamin C and phosphorus(Table 9). Regardless of weight loss attempt, energy intake was 70.0% of RDA for attempt group and 72.7% for non-attempt group. Especially, it is noticeable that calcium and iron intakes were less than 50% of the RDA(Table 9). The ratio of calcium : phosphorus was 1 : 2.2, which was higher than the recommended level of 1 : 1 - 1.5(Korean Nutrition Society 1995). This raises a concern, because young women who are deficient in calcium will have decreased level of bone mass and are more likely to be at risk for osteoporosis after menopause. Similar to current study, Kye & Paik(1993) also reported that iron and calcium consumption was less than half of the RDA.

Although the analysis by convenience method(Moon et al. 1994) was not reported in this paper, the analysis of dietary intakes by CAN-pro was somewhat lower than analysis by convenience method in this study. Several factors may explain this phenomenon. Although 24-hour recall was done using food pictures, subjects might have difficulty in figuring out portion sizes and ingredients of meals or food. It is also possible that subjects missed the items of meals or did not recall the food they ate.

This study examined several nutritional variables of female university students and investigated these according to weight loss attempt status. Contrary to expectation, this study did not reveal many significant differences in nutritional variables by weight loss attempt. This might be partly attributed to relatively low consumption of nutrients found both in weight loss attempters and in non-attempters. Considering that there are few programs for

Table 8. Composition(%) of daily calorie intake(CAN) by weight loss attempt

	Total (n=172)	Weight control		t-value
		Attempt group (n=82)	Non-attempt group (n=90)	
Carbohydrate	59.4±8.6 ¹⁾	56.9±8.5	58.2±8.7	-0.3
Protein	15.7±5.2	18.9±20.2	17.6±3.3	0.9
Fat	24.9±7.5	24.2±7.4	24.2±7.7	0.7

1) mean±SD

Values are not significantly different between the two groups at p <0.05.

Table 9. Dietary intakes of subjects by weight loss attempt(CAN-Pro)

Variables	Total (n=172)	Weight loss		t-value
		Attempt group	Non-attempt	
Energy(kcal)	1479.8±526.1(71.4) ¹⁾	1508.2±525.6(70.0)	1543.8±528.0(72.7)	-0.4
Protein(g)	57.9±49.0(93.3)	71.3± 68.6(96.5)	68.1± 22.5(90.3)	0.4
Fat(g)	41.0±48.8	40.6± 54.0	41.4± 43.8	-0.3
Carbohydrate(g)	219.8±84.6	214.4± 86.0	224.7± 83.5	-0.8
Iron(mg)	8.0±3.8(44.4)	7.5± 3.6(41.7)	8.5± 3.9(47.0)	-1.7
Phosphorus(mg)	781.1±315.0(105.3)	739.7±295.4(100.5)	818.9±328.9(109.7)	-1.7
Calcium(mg)	361.6±205.6(48.9)	341.5±187.0(46.6)	380.0±220.6(51.0)	-1.6
Vitamin A(R.E)	545.3±425.7(77.9)	536.9±485.5(76.7)	552.9±365.3(79.0)	-0.2
Vitamin B ₁ (mg)	1.0±0.5(92.1)	1.0± 0.5(92.1)	1.0± 0.4(92.2)	-0.2
Vitamin B ₂ (mg)	0.9±0.4(69.3)	0.8± 0.4(67.3)	0.9± 0.4(91.1)	-0.8
Niacin(mg)	11.1±5.3(85.1)	10.9± 5.4(84.0)	11.2± 5.2(86.0)	-0.3
Vitamin C(mg)	84.7±91.6(154.0)	89.7±103.1(163.1)	80.1± 79.9(145.6)	0.7
Fiber	3.8±2.0	3.6± 2.0	4.1± 2.0	-1.6
Cholesterol	232.8±167.2	213.8±156.6	250.1± 79.9	-1.4

1) mean±SD (% RDA(1995))

college women, this study provides baseline information regarding psychosocial status, nutritional knowledge and eating behaviors of college women. Future nutrition education might focus on helping female university students to establish right perception of obesity and ideal body image, increasing nutritional knowledge regarding energy requirement and adequate weight loss methods. Furthermore, nutrition education should include strategies to help students develop desirable eating patterns and consume adequate amounts of nutrition such as calories, calcium, and iron.

Summary and Conclusion

This study was designed to examine weight control attempt, psychosocial status, nutritional knowledge, dietary attitudes, dietary intakes, and to identify if these statistics were different by weight loss attempt.

1) The subjects' mean age was 20.4, height and weight were 162.7cm, and 51.3kg. The mean BMI was 19.4. Height was similar to the Korean standard(for ages between 20 and 24), and weight and BMI was lower than the standard.

2) Those who were trying to lose weight were 109(48.4%) out of 225 students. When subjects were further categorized by BMI or obesity index, none of the subjects were grouped into overweight or obese. Instead, those who were underweight were 58.7% among the weight loss attempters. This finding raises the serious concern for unnecessary weight loss among female university students. It is required for young adult women to establish ideal body weight and to correct the concept of obesity.

3) Psychosocial status reflects the mental as well as physical health status. Female students in non-attempt group scored higher on life satisfaction and felt that they have more potential ability in life than students in weight loss attempt group. It might be said that subjects in non-attempt group are more mentally healthy and socially stable. There was no difference in self-esteem between the two groups.

4) Subjects in weight loss attempt group showed undesirable eating patterns. They were more likely to skip meals and do other behaviors while eating such as watching TV or reading newspapers. Subjects showed favorable dietary attitudes and there was no significant difference by weight loss attempt status. Subjects also had a moderate-

to high level of nutritional knowledge.

5) Dietary intake data indicated that the energy derived from fat was slightly higher than the recommended level. Most nutrient intakes were lower than the RDA, except vitamin C and phosphorus. Particularly, iron and calcium intakes were below 50% of the RDA.

6) It is desirable to induce changes in nutrition behavior for health promotion of young adult women. This quantitative study examined psychosocial status and nutritional factors in female university students. Study results revealed that subjects acquired nutritional knowledge, however, they showed undesirable eating behavior including irregular meals, skipping meals, doing some behavior while eating, and eating quickly. In addition, their dietary intakes did not reach the RDA, especially iron and calcium intake were deficient. Although this study did not reveal significant differences in nutritional knowledge or dietary intake by weight loss attempt, this study provides some baseline information for developing a nutrition education program for female university students.

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