Journal of Culinary Research, Volume 20, Number 5, pp.16-21, 2014

http://www.culinary.re.kr

Eating Behavior and Physical Activity among College Students: A Descriptive Approach to the Gender Difference

Hyun-Woo Joung[1], Joo Ahn[2] and Hak-Seon Kim[3,¶]

[1]Dept. of Nutrition and Hospitality Management, The University of Mississippi University, USA
[2]Dept. of Nutrition, Hospitality, and Retailing, Texas Tech University, USA
[3]Dept. of Foodservice Management, Kyungsung University, Busan 608-736, Korea

ABSTRACT: The current study examined college students' overall eating behavior and physical activity, highlighting differences between male and female students attending a public university in the southwestern United States. Research findings indicated that many college students did not eat enough fruits, fruit juices, and green salad. Furthermore, the results of Chi-square analysis showed that there were significant differences in consumption amounts of green salad, hamburgers/hot dogs/sausage, and French fries/potato chips between male and female students. Study findings showed that when students were asked about attributes of food/restaurant choice, female students were more concerned about nutritional aspects when they chose the foods compared with male students. In terms of physical activity levels among college students, male students were more likely to participate in sports activities and weight training. On the other hand, female students were more inclined to walking or bicycling.

Keywords: College Student, Eating Behavior, Physical Activity, Gender Difference

INTRODUCTION

Obesity is becoming a serious problem in the United States. According to the National Health and Nutrition Examination Survey (NHANES) data, about 65% of U.S. adults (i.e., the age of 20 or more) are overweight or obese (Kim, Ahn, & No, 2012). In fact, college students, as part of the U.S. adult population, are more vulnerable to weight gain than the general population (Strong, Parks, Anderson, Winett, & Davy, 2008). This is no small problem, particularly in light of 2010 U.S. Census Bureau data that reflects a significant increase in the college student population-there were about 19 million college students in 2008. Many researchers have identified that students entering college are faced with many stresses, which often lead to unhealthy changes in eating and exercise behaviors (Shaffer, Donato, LaBrie, Kidman, & LaPlante, 2005). One research even indicated that college freshmen experienced an average weight gain of 15 pounds or more (Hoffman, Policastro, Quick, & Lee, 2006).

Food-nutritionally balanced meals-is a critical factor for influencing people's desire to adequately maintain their health (Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999). In the context of college students, one research study specifically showed that most college students used fast-food restaurants 6 to 8 times a week (Driskell, Kim, & Goebel, 2005). With these troubling study results in mind, more work is needed to better understand eating behavior among college students and how these students can develop healthy lifestyle in their college years. Physical activity is also an important factor when college students are deciding whether to adequately maintain their health life. College students become more sedentary and their physical activity level decreases during college years. This can lead to higher Body Mass Index ("BMI"), weight increase, obesity, and a host of other health issues. Therefore, it is important to understand physical activity levels among college students and to develop a way to increase these levels during their college years in order to provide cues that can help college students lose weight or at least keep from gaining weight. Furthermore, it is also important to understand if there are any differences between male and female college students with respect to food behaviors and consumption. Some previous research studies indicated behavioral differences between genders, such as different food selection cues (Kwun, 2011) and social behaviors on the foodservice settings (Han & Ryu, 2006) between gender groups.

Eating behavior and physical activity among college students have been well-documented quantitatively and qualitatively. However, little is known about the behavioral differences (e.g., eating behavior and physical activity) between genders. Therefore, the current study examined college students' overall eating behavior and physical activity and the behavioral difference between male and female students.

LITERATURE REVIEW

§ Corresponding Author: Hak-Seon Kim, Ph.D., Assistant Professor, Dept. of Foodservice Management, Kyungsung University, 309 Suyeong-ro, Nam-gu, Busan 608-736, South Korea, Tel. +82-10-663-4473, Fax. +82-51-627-6830, E-mail: foodservice@ks.ac.kr
Received: 18 August, 2014, Revised: 7 October, 2014, Accepted: 20 October, 2014.

Eating Behavior

Eating disorders among college students are widespread, causing serious public and societal concern (Striegel-Moore, Silberstein, Frensch, & Rodin, 1988). These eating disorders have resulted from various factors, such as time management, convenience, costs, and weight control in a food selection (Driskell *et al*., 2005). A plausible reason for eating disorders is that many college students skip breakfast to save some time and grab any convenient foods while rushing between classes (Davy, Benes, & Driskell, 2006). This occurs because most college students highly relate good grades to their future career success. However, several studies indicate the importance of a balanced diet, including eating a balanced breakfast, for college students in order to maximize academic performance (Benton & Sargent, 1992; Berkey, Rockett, Gillman, Field, & Colditz, 2003; Pollitt, 1995). College students' eating behavior tends to become worse during college years than other young adulthoods because they often do not meet dietetic recommendations for the consumption of nutrients (Grace, 1997). In addition, the usual college students' diets are high in fat and sodium due to consuming fast food, and low in fruits and vegetables (Galore, Walker, & Chandler, 1993). One previous study indicated that only 26.3% of college students eat fruits and vegetables every day and that over 20% of college students eat foods of high fat contents three times or more a day (Freisling, Haas, & Elmadfa, 2010). The problem with this unbalanced eating disorder is that inadequate fruit and vegetable consumption is associated with several psychosocial lives, such as weight dissatisfaction and poor academic performance (Neumark-Sztainer, Story, Resnick, & Blum, 1996), as well as with physical health, such as obesity, diabetes, etc.

Physical Activity

Physical activity is defined as any body movements produced by skeletal muscles that result in energy expenditure (Paffenbarger, Blair, & Lee, 2001). The terms of physical activity and exercise have been used interchangeably; however, the exercise is considered to be a subset of physical activity, specifically planned and structured physical activity (Hedley, Ogden, Johnson, Carroll, Curtin, & Flegal, 2004). In terms of physical activity among college students, one previous study indicated that college students' poor behavioral pattern (i.e., physical activity) can contribute to overweight and obesity among adults (Racette, Deusinger, Strube, Highstein, & Deusinger, 2005). Douglas *et al.* (1997) found from the 1995 College Health Risk Behavior survey that 35 % of college students were overweight and/or obese and that poor nutritional life and physical activity could lead to health problems in their future. In this regard, National Survey (U.S. Department of Education, 2009) suggested that college students play a significant role for reducing the overweight population among adulthood by promoting health education, such as weight management practices. Furthermore, physical activity among college students through health promotion can reduce the risks of several chronic diseases, such as excess adiposity, hypertension, heart disease, stroke, and some cancers (U.S. Department of Health and Human Service, 1996). Some previous research studies also indicated that college students are less involved in physical activities in their college years. One research study stressed the serious problems with the lack of college students' physical activity, showing that about 50% of college students had insufficient physical activity and that about 20% of college students did not exercise (Keating, Guan, Pinero, & Bridges, 2005). Strong *et al.* (2008) found that exercise in people's college years was an important factor associated with health behaviors; however, they reported a decline in physical activity and exercise among college students.

Gender Differences on Eating Behavior and Physical Activity among College Students

The amounts of food energy consumed by males and females are usually different due to the difference of recommended calorie intakes. Even so, eating behavior between males and females has shown differently. In fact, Kwun (2011) indicated that perceptions between males and females about foods and attributes of food selection were shown differently. In addition, female students tend to consider their beauty and appearance as a critical factor for social and career success, significantly affecting their diet, eating behavior, physical attractiveness, etc. (Pipher, 1994). Therefore, female students are more likely to lose weight and to diet while male students try to lose weight through physical activity and/or exercise more than dieting (Page & Fox, 1998). One research study also indicated that, biologically, women are more likely to worry about their body fat and appearance than men are (Rodin, Silberstein, & Striegel-Moore, 1984). Despite this theoretical evidence, more empirical research is needed to study gender differences on eating behavior and physical activity among college students.

Method

A convenience online sampling method and cross-sectional study was conducted to examine eating behavior and physical activity among college students attending a public university in the southwestern United States. Participants completed surveys about eating-related behavior, level of physical activity, and restaurant choice in February 2010. Out of 280 potential samples (estimated number of students who attended six different classes), 251 usable questionnaires were collected and used for the analysis. Frequencies, *t*-test, and chi-square analyses were used in order to describe college students' eating behavior and physical activity and to compare behavioral difference between male and female students.

RESULTS

Sample

Table 1 presents the socio-demographic characteristics of the sample, showing that 48.6% of the respondents (n=122) were male and 51.4% (n=129) were female. The average age of the respondents was 21.98 (SD=3.78). About 42% of respondents were junior students, followed by sophomore (21.5%), senior (21.1%), etc. The majority of the respondents (68.1%) were White, followed by Asian (15.1%), Hispanic (12.4%), and African-American (2.8%).

Description of Eating Behavior

Table 1. Demographic profile of the sample (N=251)

Characteristics	Category	N	%
Gender	Male	122	48.6
	Female	129	51.4
Age	Under 20 years	107	42.6
	21~25 years	110	43.8
	26~30 years	20	8.0
	Over 30 years	11	4.4
Classification	Freshman	11	4.4
	Sophomore	54	21.5
	Junior	105	41.8
	Senior	53	21.1
	Graduate	28	11.2
Ethnicity	White	171	68.1
	Hispanic	31	12.4
	African-American	7	2.8
	Asian	38	15.1
	Other	4	1.6

Table 2. Gender comparison in typical eating behavior (N=251)

Typical eating behavior		Total N(%)	Gender		χ^2
			Male	Female	
How many times do you eat… (per day)					
Fruit?	0 time	52(20.7)	29(23.8)	23(17.8)	3.48
	1 time	132(52.6)	66(54.1)	66(51.2)	
	2 times	43(17.1)	16(13.1)	27(20.9)	
	3 or more times	24(9.6)	11(9.0)	13(10.1)	
Fruit juice?	0 time	95(37.8)	39(32.0)	56(43.4)	4.44
	1 time	104(41.4)	54(44.3)	50(38.8)	
	2 times	40(15.9)	21(17.2)	19(14.7)	
	3 or more times	12(4.8)	8(6.6)	4(3.1)	
Green salad?	0 time	87(34.7)	52(42.6)	35(27.1)	11.69**
	1 time	132(52.6)	60(49.2)	72(55.8)	
	2 times	23(9.2)	5(4.1)	18(14.0)	
	3 or more times	9(3.6)	5(4.1)	4(3.1)	
Hamburger, hot dogs, or sausage?	0 time	98(39.0)	28(23.0)	70(54.3)	35.27***
	1 time	106(42.2)	57(46.7)	49(38.0)	
	2 times	34(13.5)	25(20.5)	9(7.0)	
	3 or more times	13(5.2)	12(9.8)	1(0.8)	
French fries or potato chips?	0 time	85(33.9)	41(33.6)	44(34.1)	8.70*
	1 time	122(48.6)	52(42.6)	70(54.3)	
	2 times	32(12.7)	23(18.9)	9(7.0)	
	3 or more times	12(4.8)	6(4.9)	6(4.7)	

Note: $^{*}p<.05$, $^{**}p<.01$, $^{***}p<.001$.

Typical eating behavioral questions among college students were asked, and the results were described in Table 2. Furthermore, eating behavioral differences between male and female students were also presented. In terms of fruit and fruit juice, there was no difference between male and female students. However, the results show many students have not been eating fruit (male: 23.8%; female: 17.8%) and fruit juice (male: 37.8%; female: 43.4%). In terms of green salad, hamburger/hot dog/sausage, and French fries/potato chips, chi-square analysis found that there were significant differences between male and female students. About 57% of male students eat green salad at least once a day while about 73% female students eat it at least once a day (χ^2=11.69, p<.01). The results also showed that male students tend to eat more hamburger/hot dog/sausage (χ^2=35.27,

$p<.001$) and French fries/potato chips ($\chi^2=8.70$, $p<.05$) than female students, indicating male students are having more high-calorie foods than female students.

Why students choose certain foods or restaurants (i.e., attributes of students' food choice) was also asked and the differences between male and female students were compared (*see* Table 3). Major reasons of food choice were food tastes and affordable price for both male and female students. On the other hand, some other attributes were presented differently by male and female students. One noticeable difference between male and female students is that female students are more concerned about nutritional aspects when they choose the foods compared with male students. The *t*-test also found that there was a significant difference on this attribute (i.e., nutrition) between male and female students ($t=-4.30$, $p<.001$).

Description of Physical Activity

Table 4 presents the level of college students' physical activity and the difference between male and female students. The results indicate that college students exercised (e.g., sports activities, stretching, weight training, or bicycle) two to three days per week. However, there were some differences between male and female students. Male students were more likely to participate in sports activities and weight training while female students were more inclined to walking or bicycling. The *t*-test also found that there was a significant difference on the frequencies of weight training between male and female students ($t=2.45$, $p<.05$).

Perceptions about Health and Physical Activity among College Students

The survey included items asking about the changes to respondents' eating habits and physical activity after they came to the university. As shown in Table 5, chi-square analysis showed that there was no difference between male and female students in terms of their diet and physical activity, and that male and female students had similar patterns of change. However, study findings indicated that about 44% of participants responded that their diets were more healthful prior to coming to college, and more than half of the participants responded that they engaged in more physical activity prior to college.

DISCUSSION AND CONCLUSION

The current descriptive study provided information about college students' eating behavior, their level of physical activity, attributes of foods and/or restaurants choice, and the perception about their health and physical activity. The current study principally compared behavioral differences between male and female students. Study findings indicated that many college students do not eat fruit (20.7%), fruit juice (37.8%), and green salad (34.7%). This finding is consistent with the previous study report (Freisling *et al*., 2010), showing that many college students barely eat fruits and vegetables. Moreover, Cluskey and Grobe (2009) indicated in their study that college students have struggled with adapting healthy eating, nutritional diet, and exercise behaviors to college life. The lack of healthy food options and few affordable fresh vegetables and fruits for students on campus is a

Table 3. Gender comparison in attributes of food choice (N=251)

Attributes	Total	Gender		*t*-value
		Male	Female	
Taste	4.44[a](1[b])	4.39(1)	4.50(1)	−1.15
Familiarity with foods	3.73(3)	3.66(3)	3.79(5)	−1.03
Ingredients	3.23(7)	3.24(6)	3.22(7)	0.18
Price	4.26(2)	4.20(2)	4.33(2)	−1.12
Nutrition	3.63(5)	3.36(5)	3.88(3)	−4.30***
Short serving time	3.73(3)	3.62(4)	3.84(4)	−1.83
Suggestions from friends and/or family	3.28(6)	3.18(7)	3.37(6)	−1.48

Note: ***$p<.001$, [a]Average scores from 1 to 7, [b]Ranks among 7 attributes.

Table 4. Gender comparison in the level of physical activity (N=251)

Level of physical activity	Total	Gender		*t*-value
		Male	Female	
On how many of the past 7 days did you…				
Exercise or participate in sports activities that made you sweat or breathe hard for at least 20 minutes.	2.85[a]	2.93	2.78	0.65
Do stretching exercises, such as tow touching, knee bending, or leg stretching?	2.60	2.51	2.69	−0.74
Do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	2.53	2.86	2.22	2.45*
Walk or bicycle for at least 30 minutes at a time?	3.02	2.76	3.27	−1.76

Note: *$p<.05$, [a]Number of days per week.

Table 5. Changes of respondents' diet and physical activity after coming to college (N=251)

		Total N(%)	Gender		χ^2
			Male	Female	
How would you characterize the healthfulness of your diet?	More healthful	110(43.8)	58(47.5)	52(40.3)	1.44 n.s.[a]
	About the same	86(34.3)	40(32.8)	46(35.7)	
	Less healthful	55(21.9)	24(19.7)	31(24.0)	
How would you characterize your level of physical activity?	More physical activity	134(53.4)	65(53.3)	69(53.5)	1.13 n.s.
	About the same	66(26.3)	35(28.7)	31(24.0)	
	Less physical activity	51(20.3)	22(18.0)	29(22.5)	

Note: [a]Not significant.

likely reason for this result. Furthermore, many students are often forced to grab any convenient foods-whether they are healthy or not-in order rush to classes (Kim *et al*., 2012). The study also found that there were significant differences in consumption of green salad (χ^2=11.69, p<.01), hamburger, hot dogs, or sausage (χ^2=35.27, p<.001), and French fries or potato chips (χ^2=8.70, p<.05) between male and female students. Male students tend to eat significantly less salad but more hamburger, hot dogs, sausage, and French fries/potato chips than female students. According to Cluskey and Grobe's (2009) study, male students were less concerned about weight and health in their lifestyle compared with female students. Another research finding from the current study can also support the gender difference above. When college students were asked about attributes of foods/restaurants choice, female students perceived the nutrition aspect more importantly than male students did (*see* Table 3). In this regard, Soriano and Cala (2014) pointed out that women are more concerned about their body weight and Figure in order to fulfill socially constructed ideals of beauty. Additionally, the current study found that many more female students (70.5%)-compared to 47.5% of male students-exercise to lose weight or to keep from gaining weight. One previous research study indicated that frequency of physical activity among college students declined within the typical university years (Kim *et al*., 2012). The current study also found that participants were engaged in physical activities (e.g., sports activities, stretching, weight training, etc.) about two to three days per week, and there were no significant differences between male and female students. Furthermore, when asked about the level of physical activity after coming to college, about 20% of total respondents (male: 18.0%; female: 22.5%) indicated that they were less involved in physical activeties while in college.

The current study has some limitations and also directs possible future research. First, the current study was conducted at one public university located in the southwestern United States, proposing a generalizability issue. Therefore, collecting nationwide and/or even cross-cultural data can validate the study findings. Second, the current study used a descriptive approach, so it was hard to explain the relationships between variables (e.g., eating behavior, physical activity, etc.). Thus, future research can use inferential statistics to explain the relationships other than through a description of the study results. Last, a longitudinal study would be more suitable for this type of research by collecting and analyzing sequential data over the college years.

REFERENCES

Benton, D., & Sargent, J. (1992). Breakfast, blood glucose and memory. *Biological Psychology, 33*(2-3), 207-210.

Berkey, C. S., Rockett, H. R. H., Gillman, M. W., Field, A. E., & Colditz, G. A. (2003). Longitudinal study of skipping breakfast and weight change in adolescents. *International Journal of Obesity, 27*, 1258-1266.

Cluskey, M., & Grobe, D. (2009). College weight gain and behavior transitions: Male and female differences. *Journal of American Dietetic Association, 109*(2), 325-329.

Davy, S. R., Benes, B. A., & Driskell, J. A. (2006). Sex differences in dieting trends, eating habits, and nutrition beliefs of a group of Midwestern college students. *Journal of the American Dietetic Association, 106*(10), 1673-1677.

Douglas, K. A. *et al.* (1997). Result from the 1995 national college health risk behavior survey. *Journal of American College Health, 46*(2), 55-67.

Driskell, J. A., Kim, Y., & Goebel, K. J. (2005). Few differences found in the typical eating and physical activity habits of lower-level and upper-level university students. *Journal of the American Dietetic, 105*(5), 798-801.

Freisling, H., Haas, K., & Elmadfa, I. (2010). Mass media nutrition information sources and associations with fruit and vegetable consumption among adolescents. *Public Health Nutrition, 13,* 269-275.

Galore, S. R., Walker, C., & Chandler, A. (1993). Brief communication: Dietary habits of first-year medical student as determined by computer software analysis of three-day food records. *Journal of the American College Nutrition, 12*(5), 517-520.

Grace, T. W. (1997). Health problems of college students. *Journal of the American Dietetic, 45*, 243-250.

Han, H., & Ryu, K. (2009). The roles of the physical environment, price perception, and customer satisfaction in determining customer loyalty in the restaurant industry. *Journal of Hospitality & Tourism Research, 33*(4), 487-510.

Hedley, A. A., Ogden, C. L., Johnson, C. L., Carroll, M. D., Curtin, L. R., & Flegal, K. M. (2004). Prevalence of overweight and obesity among US children, adolescents, and adults, 1999-2002. *Journal of the American Medical Association, 291*(23), 2847-2850.

Hoffman, D. J., Policastro, P., Quick, V., & Lee, S. K. (2006). Changes in body weight and fat mass of men and women in the first year of college: A study of the "Freshman 15". *Journal of Ame-*

rican College Health, 55(1), 41-46.

Keating, X. D., Guan, J., Pinero, J. C., & Bridges, D. M. (2005). A meta-analysis of college students 'physical activity behaviors'. *Journal of American College Health, 54*(2). 116-125.

Kim, H. -S., Ahn, J., & No, J. -K. (2012). Applying the health belief model to college students' health behavior. *Nutrition Research and Practice, 6*(6), 551-558.

Kwun, D. J. W. (2011). Effects of campus foodservice attributes on perceived value, satisfaction, and consumer attitude: A gender-difference approach. *International Journal of Hospitality Management, 30,* 252-261.

Neumark-Sztainer, D., Story, M., Resnick, M. D., & Blum, R. W. (1996). Correlates of inadequate fruit and vegetable consumption among adolescents. *Preventive Medicine, 25*(5), 497-505.

Paffenbarger, R. S., Blair, S. N., & Lee, I. (2001). A history of physical activity, cardiovascular health and longevity: The scientific contributions of Jeremy N. Morris, DSC, DPH, FRCP. *International Journal of Epidemiology, 30*(5), 1184-1192.

Page, A., & Fox, K. R. (1998). Is body composition important in young people's weight management decision-making? *International Journal of Obesity and Related Metabolic Disorders, 22*(8), 786-792.

Pipher, M. (1994). *Reviving Ophelia: Saving the Selves of Adolescent girls*. New York, NY: Ballantine.

Pollitt, E. (1995). Does breakfast make a difference in school. *Journal of the American Dietetic, 95*(10), 1134-1140.

Racette, S. B., Deusinger, S. S., Strube, M. J., Highstein, G. R., & Deusinger, R. H. (2005). Weight changes, exercise, and dietary patterns during freshman and sophomore years of college. *Journal of American College Health, 53*(6), 245-251.

Rodin, J., Silberstein, L., & Streigel-Moore, R. (1984). Women and weight: A normative discontent. *Nebraska Symposium on Motivation, 32*, 267-307.

Rozin, P., Fischler, C., Imada, S., Sarubin, A., & Wrzesniewski, A. (1999). Attitude to food and role of food in life in the USA, Japan, Flemish Belgium and France: Possible implications for the diet-health debate. *Appetite, 33*(2), 163-180.

Shaffer, H. J., Donato, A. N., LaBrie, R. A., Kidman, R. C., LaPlante, D. A. (2005). The epidemiology of college alcohol and gambling policies. *Harvard Reduction Journal, 2(1)*, 1-20.

Soriano, E., & Cala, V. C. (2014). Comparison of dietary habits among Romanian, Moroccan and Spanish adolescents in southern Spain: Cross-cultural and gender differences. *Procedia-Social and Behavioral Sciences, 132,* 10-18.

Striegel-Moore, R. H., Silberstein, L. R., Frensch, P., & Rodin, J. (1988). A prospective study of disordered eating among college students. *International Journal of Eating Disorders, 5*(5), 935-947.

Strong, K. A., Parks, S. L., Anderson, E., Winett, R., & Davy, B. M. (2008). Weight gain prevention: Identifying theory-based targets for health behavior change in young adults. *Journal of the American Dietetic Association.*

U.S. Census Bureau. 2010. College enrollment summary. http://www.census.gov/2010census

U.S. Department of Education (2009). National Center for Education Statistics, 1998~99 and 2008~09 Integrated Postsecondary Education Data System (IPEDS), "Completions Survey" (IPEDS-C:99) and Fall 2009.

U.S. Department of Health and Human Service. (1996). *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity*. Rockville, MD: US Department of Health and Human Services.