

# A Study on Dietary Habits, Alcohol Use Disorder and Physical Health Problems of College Students

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**Abstract: Background/Objectives:** This study was aimed to investigate the correlations among dietary habit, alcohol use disorder and physical health problem in Korean college students.

**Methods/Statistical analysis:** In this cross-sectional study, we randomly selected 194 college students. BMI, cholesterol, dietary habit, AUDIT, physical health problems were assessed through questionnaires and test. Data were analyzed using descriptive statistics, t-test, ANOVA and Pearson correlation using SPSS/IBM 23.0 software. **Findings:** With regard to BMI, 9.6%, 10.2% of the students were underweight and obese respectively. Dietary habit score showed a statically significant difference by residence ( $F=19.53, p<.001$ ). The AUDIT score showed a statically significant difference according to gender ( $t=-2.25, p=.026$ ), smoking ( $F=10.09, p<.001$ ) and dietary behavior frequency of eating out ( $F=3.14, p=.026$ ). Physical health problems score showed a statically significant difference according to gender ( $t=2.25, p=.025$ ), smoking ( $F=10.09, p<.001$ ), alcohol use ( $t=5.09, p=.025$ ), dietary behavior frequency of midnight snacking ( $F= 3.74, p=.025$ ). Physical health problems were significantly correlated with age ( $r=.15, p=.038$ ) and AUDIT ( $r=.14, p=.046$ ). **Improvements/Applications:** Positive associations were observed between AUDIT and physical health problems among Korean college students. More attention should be paid towards dietary habit such as eating out with drinking or midnight snacking in college life, to improve physical health and help prevent related health problems later in life. Based on these findings, development of nutrition education program considering lifestyle and nutritional status of college students is required.

**Keywords:** Dietary habits, BMI, Physical health, AUDIT, Student.

## I. INTRODUCTION

Good nutrition is a very important factor in maintaining good health, and is done by eating the right diet. The individual's eating habits are finally completed at age 16-20 and they are relatively easy to change before puberty but hardly change after adulthood<sup>[1]</sup>. Food intake patterns are associated with different immediate complications and major

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long-term consequences including cardiovascular diseases, high blood pressure and some other psychological disorders like depression<sup>[2]</sup>. Therefore, it is necessary to establish the right eating habit by recognizing the importance of nutrition through meal. It is also necessary to have a healthy lifestyle for a healthy lifetime. During the college years, most of the body functions are fully developed and the height, muscle strength, health status, and endurance are reached at the maximum level and then gradually decreased over the next 20-30 years and the extent of the decline varies greatly depends on the individual's nutritional status, momentum, workload and climate, etc<sup>[3]</sup>. Further, the period of college students is an important and unique developmental stage for the establishment of health-related behavioral patterns since it is the transition phase from adolescence to adulthood<sup>[4]</sup>. Thus, it is very important to pay attention to health in this period because it is directly related to the health after the adulthood.

However, current college students are not interested in health because they are young and healthy, and they are not aware of the importance of nutrition through meals<sup>[5]</sup>. Therefore, many college students have irregular eating habits, a high rate of not eating, a high proportion of snacks, high drinking and smoking rates<sup>[6]</sup>. In addition, there is a lot of health problems due to concern about thin body type and inappropriate eating habits due to excessive weight control<sup>[6]</sup>. According to previous studies, Korean college students have a high preference for bread, low preference for herbs<sup>[7]</sup>, and high frequency of fast food intake<sup>[7,8]</sup>, so food selection criteria depend on convenience rather than nutritional value<sup>[9]</sup>. In addition to inappropriate meals, smoking and excessive drinking may have a negative impact on the health of college students. According to previous studies, the drinking rate of college students was 92.1%<sup>[10]</sup>, which means that almost all students drink in Korea and over 39.6% of the respondents reported drinking 1-3 days a week<sup>[11]</sup>. The prior study also found that many students smoke. The smoking rate of college students was 33.8%, started smoking in high school<sup>[10]</sup>.

Excessive drinking during college students may result in poor learning, economic loss, accident or violence, or poor health. Beginning to smoke can be difficult to stop with nicotine dependence and can lead to long-term health-damaging injuries. Drinking consumption also changes students' eating habits.



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Most students who drink more had often dietary problems such as fast eating, skipping meal and spending too much money on fast food [11].

Currently, college students in Korea are experiencing stress due to academic competition and job preparation after entering university, and they are exposed to various risks related to health behavior because of unhealthy eating habits, lack of exercise, frequent drinking and smoking [12].

Thus, we tried to anthropometric and biochemical measurements including BMI, cholesterol and smoking, alcohol habit and dietary habit as unhealthy behaviors among college students and ultimately, our study will provide basic data for preparing health promotion programs for university students.

## II. MATERIALS AND METHODS

### 2.1 Study design

This study is a descriptive study to investigate the correlations among dietary habit, alcohol use and physical health problem in college students.

### 2.2 Participants

Participants of this study were 194 students from one university located in Chungnam province, and the survey was conducted in 2015. The purpose of the study, data confidentiality, and possibility of withdrawal were explained to participants, the written informed consent was obtained.

### 2.3 Measurements

#### 2.3.1 Dietary behavior

Frequency of meal per day, frequency of eating out, person with whom eats out together and frequency of midnight snacking were included in dietary behavior.

#### 2.3.2 Anthropometric and biochemical measurements

Height, weight, and blood pressure were measured by trained staff, respectively. Blood sampling for Total cholesterol was conducted after fasting for at least eight hours. BMI was calculated by dividing weight (kg) by the square of height (m<sup>2</sup>). Subjects were classified as four groups based on BMI levels (underweight, <18.5 kg/m<sup>2</sup>; normal weight, 18.5–22.9 kg/m<sup>2</sup>; overweight, 23.0–24.9 kg/m<sup>2</sup>; obese, ≥ 25.0 kg/m<sup>2</sup>) [14].

#### 2.3.3 Smoking

Participants were categorized as nonsmokers or smokers based on their answers to the questionnaire.

### 2.3.4 Alcohol use disorder

At baseline, participants completed the Alcohol Use Disorders Identification Test (AUDIT) to index alcohol use disorder symptom severity [13] and AUDIT total scores were calculated by summing the ten items of that questionnaire, can range from 0 to 40 and are commonly split into the following categories: low risk (0–7), hazardous (8–15), harmful (16–19) and possible dependent (20–40).

### 2.3.5 Dietary habits

The tool of dietary habits, developed by Kim [15] was used to measure students' eating habits. There were a total of 10 items based on a 5-point Likert. Higher scores indicated a higher good eating habit. Cronbach's alpha for the dietary habits in this paper was .81.

### 2.3.6 Physical health problems

Higher score means a lot of physical health problems. Cronbach's alpha for the physical health problems in this study was .79.

## III. RESULTS

### 3.1 Anthropometric and biochemical characteristics

Table 1 presents the anthropometric, biochemical and lifestyle characteristics of subjects. The subjects' mean age was 21.4 years. Male subjects comprised 48.6%, and female subjects comprised 51.3%. With regard to BMI, 9.6% of the students were underweight, 65.8%, 14.4%, 10.2% of the normal weight, over weight and obese students, respectively. Systolic blood pressure was 126.4mmHg for males and 116.9mmHg for females. Mean total cholesterol level was 137.53±36.41 mg/dl for female, 119.45±30.55mg/dl for male students.

In total, 14.9% of the subjects were daily smokers. Possible dependent alcohol user was 5.8% of students. With regard to dietary behavior, 19.1% of the respondents were eating out every day, and 13.8% were taking midnight snacking over four times a week.

Table1. General and anthropometric characteristics, unhealthy behaviors (N=189)

Variables	Categories	n	%	M±SD	Range
Age (years)				21.28±2.27	17~31
Gender	Female	97	51.3		
	Male	92	48.7		
Grade	1st	70	37.0		
	2nd	34	18.0		
	3rd	41	21.7		
	4 <sup>th</sup>	44	23.3		
Residence	With parent	97	51.3		
	Dormitory/ lodging	54	28.6		
	Self- boarding	38	20.1		



Height (cm)	Female	93		160.75±4.99	
	Male	92		175.13±4.62	
Weight (kg)	Female			53.82±7.16	
	Male			69.88±8.66	
BMI (kg/m <sup>2</sup> )	<18.5	18	9.6		
	18.5-22.9	123	65.8		
	23-24.9	27	14.4		
	≥25	19	10.2		
SBP (mmHg)	Female	93		116.88±9.60	
	Male	92		126.41±10.83	
Total cholesterol (mg/dl)	Female	93		137.53±36.41	
	Male	92		119.45±30.55	
Smoking	Non	146	77.7		
	Sometimes	14	7.4		
	Daily	28	14.9		
Alcohol use	Low risk	123	65.1		
	Hazardous	46	24.3		
	Harmful	9	4.8		
	Possible dependent	11	5.8		
Dietary behavior_frequency of meal per day	1	4	2.1		
	2	84	44.7		
	3	96	51.1		
	≥4	4	2.1		
Dietary behavior_frequency of eating out	Never	22	11.7		
	1-3/week	82	43.6		
	4-6/week	48	25.5		
	≥Daily	36	19.1		
Dietary behavior_person with whom eats out together	Alone	10	5.3		
	Family	18	10.5		
	Friend/colleague	132	77.2		
	School/club friend	6	3.3		
	Others	5	2.9		
Dietary behavior_frequency of midnight snacking	Never	70	37.0		
	1-3/week	93	49.2		
	≥4/week	26		13.8	

### 3.2 Difference by general characteristics, unhealthy behaviors and physical health problems

Degree of dietary habits, AUDIT and physical health problems among college students are shown in Table 2. On a five-point scale measuring dietary habit, the average score was 2.82±0.72. On a four-point scale measuring physical health problem, the average score was 31.30±6.27. For AUDIT, the average score was 6.56±0.62.

Dietary habit score showed a statically significant difference by residence (F=19.53, p<.001). The AUDIT score showed a statically significant difference according to gender (t=-2.25, p=.026), smoking (F=10.09, p<.001) and dietary behavior\_frequency of eating out (F=3.14, p=.026). Physical

health problems score showed a statically significant difference according to gender (t=2.25, p=.025), smoking (F=10.09, p<.001), alcohol use (t=5.09, p=.025), dietary behavior\_frequency of midnight snacking (F= 3.74, p=.025).

**Table2. The difference by general characteristics, unhealthy behaviors and physical health problems**

Variable	Categories	Dietary habit			AUDIT			Physical health problems		
		Mean	SD	t or F(p)	Mean	SD	t or F(p)	Mean	SD	t or F(p) Scheffe
Total		2.82	0.72		6.56	0.62		31.30	6.27	
Gender	Female	2.82	0.70	-0.10 (.924)	5.64	5.62	-2.17 (.031)*	32.27	6.05	2.25 (.025)*
	Male	2.83	0.75		7.64	6.71		30.25	6.37	
Grade	1st	2.89	0.67	0.63 (.599)	6.46	5.50	0.30 (.828)	30.54	5.60	1.03 (.380)
	2nd	2.71	0.75		7.44	7.02		30.56	6.83	
	3rd	2.87	0.72		7.05	6.58		31.90	6.04	
	4th	2.76	0.77		6.30	6.49		32.36	7.15	
Residence	With parent	3.04	0.65	19.53 ( $<.001$ ) **	6.51	6.12	0.02 (.900)	31.80	6.68	1.26 (.263)
	Dormitory/ Lodging & Self-boardi ng	2.59	0.73		6.62	6.37		30.79	5.81	
Smoking	Non	2.84	0.72	0.70 (.497)	5.70	5.73	10.09 ( $<.001$ ) **	30.64	6.19	5.74 (.004)*
	Sometimes	2.81	0.75		10.68	6.87		32.36	6.26	
	Daily	2.60	0.72		9.71	6.40		36.21	5.37	
Alcohol use	Low risk	2.86	0.72	1.31 (.254)				30.57	5.66	5.09 (.025)*
	High risk	2.74	0.71					32.70	7.13	
Dietary behavior_frequency of eating out	Never	2.86	0.74	0.09 (.964)	4.23	4.25	3.14 (.026)*	29.73	7.42	1.71 (.167)
	1-3/week	2.85	0.66		6.07	5.98		30.71	6.02	
	4-6/week	2.81	0.83		8.65	7.44		31.73	6.61	
	$\geq$ daily	2.78	0.69		6.78	5.41		33.03	5.47	
Dietary behavior_frequency of midnight snacking	Never <sup>a</sup>	2.91	0.65	1.00 (.370)	5.63	5.77	1.23 (.294)	29.96	5.73	3.74 (.025)* a<c
	1-3/week <sup>b</sup>	2.75	0.72		7.08	6.30		31.64	5.90	
	$\geq$ 4/week <sup>c</sup>	2.81	0.86		7.11	7.02		33.69	8.11	

\*p<.05, \*\*p<.001. Alcohol use; High risk= Hazardous, Harmful, Possible dependent group.

**3.3 Correlations among variables**

Physical health problems were significantly correlated with age (r=.15, p=.038) and AUDIT (r=.14, p=.046).

Dietary habits were significantly correlated with AUDIT (r= -.15, p=.042). BMI was significantly correlated with age

**Table3. Correlations among variables**

Variables	1) Age	2) SBP	3) BMI	4) Cholesterol	5) Dietary habits	6) AUDIT	7) Physical health problems
	r(p)	r(p)	r(p)	r(p)	r(p)	r(p)	r(p)
1)	1						
2)	.17(.018)	1					
3)	.27(<.001)	.35(<.001)	1				
4)	-.12(.124)	-.03(.669)	-.01(.898)	1			
5)	.01(.910)	-.13(.085)	-.02(.816)	-.13(.072)	1		
6)	.02(.775)	.01(.992)	-.02(.800)	-.03(.679)	-.15*(.042)	1	
7)	.15(.038)	-.09(.218)	.04(.622)	.09(.206)	-.10(.172)	.14(.046)	1

BMI=Body mass index; AUDIT= Alcohol use disorders identification test.

**IV. DISCUSSION**

This study was performed to provide basic data for college students' health promotion by identifying the characteristics related the unhealthy behaviors such as dietary habits, alcohol use and physical health problems among university students.

With regard to dietary habits, 19.1% of the respondents

(r=.17, p=.018), systolic blood pressure(r=.35, p<.001).

In other words, the higher the degree of obesity, the higher the blood pressure, and the more frequent drinking, the worse the eating habits and the worse the physical health can be seen (Table 3).

were eating out every day, and 13.8% were taking midnight snacking over four times a week. Frequent eating out of college students and eating in the middle of the night can cause health problems such as reflux esophagitis, obesity which makes college students worried about their health.



This study showed the average score of dietary habit was  $2.82 \pm 0.72$ , similar to Kim's study<sup>[14]</sup> and also, showed a statically significant difference by residence ( $F=19.53$ ,  $p<.001$ ). Living with parents has a better eating habit than staying in a dormitory or lodging and board-onese. During the academic term, the students are forced to spend many hours away from home and inevitably to change their eating habits. Students living away from their families also showed a trend towards lower consumption of home-cooked meals and more frequent use of quick- and easy-to-prepare meals such as ready and frozen meals<sup>[16]</sup>. This suggests that health promotion is especially needed in college students who leave their parents and live independently. In Korea, university entrance rate is 68.9% in 2017, and many high school graduates still leave their homes and move to their college. As a result, college students usually live in dormitories, boarding houses or live alone and so, most of them live in the protection and control of their parents until high school. But, when they become college students, they tend to be free from time use or life. Thus, college students often eating out and drinking with friends and colleagues. In addition, there are many times when the class time is irregular, and that it is more often eaten at late night or it buys food from the outside. If these behaviors become habitual, health problems may arise.

With regard to BMI, 9.6% of the students was underweight, 14.4%, 10.2% of the overweight and obese students, respectively. And also, BMI was a negative correlation with drinking ( $r = -.15$ ,  $p=.042$ ) and eating habits, and a positive correlation ( $r=.14$ ,  $p=.046$ ) with physical illness. These results are consisted that the students living away from their families perceived more abundant body mass than the students living in the family home<sup>[16]</sup>.

In addition, weight should be properly managed through the formation of healthy eating habits because eating habits and physical health are problematic, especially in the case of frequent eating out or nighttime eating. Moreover, in the present study, it was found that frequent smoking and nighttime snacking more than four times a week was bad for the physical health. Physical health problems score showed a statically significant difference according to gender, smoking, alcohol use, dietary behavior frequency of midnight snacking. As a result of this study, in total, 14.9% of the subjects were daily smokers and possible dependent alcohol user was 5.8% of students. Additionally, the average score of the AUDIT was 6.56 point and male students were 7.64 points, higher than female students, indicating that men drink more alcohol. This is because most students are easily exposed to drinking and smoking in Korea's university culture. The AUDIT score showed a statically significant difference according to gender, smoking ( $F=10.09$ ,  $p<.001$ ) and dietary behavior frequency of eating ( $F=3.14$ ,  $p=.026$ ). Health problems due to drinking, smoking and irregular eating habits among Korean college students are supported by the previous research<sup>[16]</sup>. Therefore, it is necessary to avoid indiscreet drinking through desirable drinking culture.

Based on these results, it is necessary to educate students about alcohol abstinence, smoking cessation, and proper dietary behavior in order to improve the health of university students. Besides, students who live away from their families have health problems related malnutrition due to irregular

eating habits. Therefore, in order to improve the health of college students and prevent health problems, it is important to form healthy lifestyles. It is necessary to reduce the frequency of eating out or to avoid eating at night, and to create a culture that does not drink excessively when eating out. In particular, among students who live away from their parents, a health promotion program should be provided to students who show dangerous health behaviors.

## V. CONCLUSION

This study was aimed to investigate the correlations among dietary habits, alcohol use disorder and physical health problem in Korean college students. The main results of this study are as follows. With regard to BMI, 9.6%, 10.2% of the students were underweight and obese, respectively. The score of dietary habits showed a statically significant difference by residence. The AUDIT score showed a statically significant difference according to gender, smoking and dietary behavior\_frequency of eating out. Physical health problems score showed a statically significant difference according to gender, smoking, alcohol use, dietary behavior\_frequency of midnight snacking. Physical health problems were significantly correlated with age and AUDIT. Based on these findings, it is necessary to develop effective nutrition education program which is proper to improve healthy dietary habits considering lifestyle variables and nutritional status of college students.

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