Iran J Public Health, Vol. 51, No.12, Dec 2022, pp.2742-2752

Original Article

Factors Influencing the Eating Behaviors of Young Adults Using the 2013-2018 Korea National Health and Nutrition Examination Survey

Myung-Ock Chae [1], ****Mi-Young Park*** [2]

1. *Department of Nursing, College of Health and Medical Sciences, Cheongju University, Cheongju, Republic of Korea*
2. *Institute of Health and Environment, Graduate School of Public Health, Seoul National University, Seoul, Republic of Korea*

***Corresponding Author:** Email: coolmypark@snu.ac.kr

(Received 19 Mar 2022; accepted 09 May 2022)

Abstract

Background: There is a substantial gap in the eating behaviors between the sexes. We aimed to analyze the predictors of eating behaviors by sex in the young adult population.

Methods: We used the data of the sixth and seventh Korea National Health and Nutrition Examination Survey conducted by the Korea Disease Control and Prevention Agency last 2013–2018. Data from 2,502 women and 2,101 men aged 19–29 yr were included in the analysis using frequency, percentage, x^2-test, and multiple logistic regression.

Results: Education (0.612, CI=0.465~0.805), economic status (2.104, CI=1.435–3.086), marital status (3.162, CI=2.356~4.243), and household structure (0.403, CI=0.208~0.782) were identified to predict the frequency of dining-out in women, while marital status (0.302, CI=0.121~0.749), economic activity (1.969, CI=1.483~2.613), and household structure (0.243, CI=0.137~0.432) predicted dining-out frequency in men. The current smoking status predicted most eating behaviors, including breakfast skipping frequency (1.864, CI=1.318~2.637), use of supplements (2.062, CI=1.439~2.953), and use of nutrition labels (1.545, 1.084~2.204) for men. Meanwhile, nutrition labeling was used less in both men (0.550, CI=0.343~0.882) and women (0.646, CI=0.473~0.882) who subjective body recognition as obesity.

Conclusion: The factors that primarily predicted the frequency of dining out in young women and the behavior of breakfast skipping, use of nutrition labels, and frequency of dining-out in men can be used as foundational data for developing sex-specific intervention programs to improve eating behaviors.

Keywords: Young adult; Sex; Eating; Behavior; Korea

Introduction

Young adults in their 20s face various social demands and consequently, they encounter diet-related problems like irregular meals, skipping breakfast, late-night meals, and ill-balanced eating (1). Skipping breakfast and dining-out are more serious among adults in the second and third decades of life than in any other age group; this finding was reported by the 2017 Korea Statistics report.

According to the 2018 Korea National Health and Nutrition Examination Survey (KNHANES), the prevalence of obesity is 16.9% among young adults aged 19–29 yr but increases by approximately 11% to 37.8% in mid-adulthood among individuals aged 30–39 yr; this rate is also higher by approximately 5% from that in 2017 (33.4%). Therefore, it is important to establish a healthy lifestyle with effective weight control interventions in early adulthood before the increase in obesity prevalence (2).

Depression, anxiety, and stress are positively correlated with eating disorders in adults aged 25 yr or younger (3) and depression is strongly associated with eating disorders only in female college students (4). Thus, the factors affecting progression of problematic eating behaviors to eating disorders in young adults may vary between sexes (4). Therefore, we aimed to use the 2013–2018 KNHANES data to identify the sociodemographic, physical, mental, and nutritional predictors of eating behaviors in young adults by sex.

Methods

Study population and data collection

This was a cross-sectional secondary analysis of the sixth (2013–2015) and seventh (2016–2018) KNHANES conducted by the Ministry of Health and Welfare and Korea Disease Control and Prevention Agency. The raw data were de-identified and obtained through an official request from the organization. The KNHANES is a credible, nationally representative statistical data on people's health status, health behaviors, and nutritional intake. Information about education, economic activity, and nutrition in the health questionnaire was obtained through an interview, while information about health behaviors was obtained using a self-report questionnaire. Stratified multistage cluster sampling was also performed. In the sixth survey, there were 24,269 participants from 10,611 households and 2,250 (9.8%) were aged 19–29 yr. In the seventh survey, there were 22,948 participants from 9,491 households and 2,353 (9.7%) were aged 19–29 yr.

The study was approved by the Institutional Review Board at Cheongju University (No. 1041107-202008-HR-040-01).

Study variables

1) Eating behaviors

Eating behaviors included the frequency of breakfast, lunch, dinner, eating out, use of dietary supplements, nutrition label awareness and use, and influence of nutrition labels on food choices. The frequency of breakfast, lunch, dinner, and eating out in the past year was divided into ≥3 times/week and ≤2 times/week. The use of dietary supplements for at least two consecutive weeks in the past year and nutrition label awareness, use, and influence on food choices were both divided into yes or no.

2) Sociodemographic factors

Sociodemographic factors included education level, economic status, marital status, economic activity, and household structure. Education level was divided into middle school or lower, high school, and college or higher. Economic status was divided into household income quartiles (low, mid-low, mid-high, and high) by sex and age in the original survey; we merged mid-low and mid-high as "middle" for our analysis. Marital status and economic activity were answered by either yes or no, and household structure was divided into single-person households and multi-person households.

3) Physical health factors

Physical health factors included physical activity, perceived health status, current smoking status, drinking frequency, and weight control. Physical activity was assessed by computing the metabolic equivalent of the task (MET) score (min/week) based on the weekly physical activity frequency (days/week) and duration (min/day) using the Global Physical Activity Questionnaire (GPAQ) developed by WHO (5); scores were classified into physical inactivity (<600 MET-min/week), moderate physical activity (600–2,999 MET-min/week), and vigorous physical activity (≥3,000 MET-min/week). Some items were modified

from the raw data: perceived health status was divided into very good, good, neutral, bad, and very bad in the raw data, but we merged very good and good to "good," and bad and very bad to "bad." Current smoking status was classified as smoking every day, occasionally, previously smoked but not anymore; we merged smoke every day and smoked occasionally into "smoke." Drinking frequency in the past year was classified as no drink at all, less than once a month, about once a month, 2-4 times a month, 2-3 times a week, and ≥ 4 times a week; we merged no drink at all, less than once a month, about once a month, and 2-4 times a month to "≤ 4 times a month." Weight control effort in the past year was classified into tried to lose weight, tried to maintain weight, tried to gain weight, did not try to control weight; we merged tried to lose weight, tried to maintain weight, and tried to gain weight to "yes."

4) Mental health factors

Mental health factors included anxiety/depression, stress, suicidal ideation, and perceived body image. Anxiety/depression was divided into not anxious or depressed, moderately anxious or depressed, severely anxious or depressed in the raw data, but we merged moderately anxious or depressed and severely anxious or depressed to "yes." Stress was divided into very high, high, low, and almost none in the raw data, but we merged very high and high to "high." Suicidal ideation in the past year was classified as yes or no. Perceived body image was classified into very thin, slightly thin, normal, slightly obese, and very obese in the raw data, but we merged very thin and slightly thin to "thin" and slightly obese and very obese to "obese."

5) Nutrition-related factors

Nutrition-related factors included prior nutrition education and diet-related circumstances. Prior nutrition education was categorized as yes or no.

Data analysis

The data were analyzed with complex sample analyses in consideration of clusters and weights using the SPSS/WIN software ver. 26 (IBM Corp., Armonk, NY, USA), and "not applicable" and "I don't know/no response" were considered as missing values for analysis.

The sex-specific differences in eating behaviors according to sociodemographic, physical, and mental health, and nutrition-related factors were analyzed using frequency, percentage, and the x^2-test.

The predictors of eating behaviors were identified by sex through multiple logistic regression. It was performed with the sociodemographic, physical, mental health, and nutrition-related factors that were found to be significant in the x^2-test.

Results

Differences of eating behaviors according to various factors

Young women and men showed differences in eating behaviors according to sociodemographic, physical and mental health and nutrition-related factors. Those who chose "≤ 2 times a week" for breakfast, lunch, and dinner frequency were considered as skipping meals frequently.

Eating frequency and eating out

Frequent skipping of breakfast (≥ 3 times/week) was found in women who were more educated (P=0.045) and who perceived themselves as obese (P=.004); and in men, those with a lower economic status (P=0.029), married (P=0.023), and with a higher stress level (P=0.026). Meanwhile, women with a higher level of stress (P=0.010), men who were less educated (P=0.005), and men from multi-person households (P=0.047) frequently skipped lunch. Women who were economically active (P=0.001), those who engaged in weight control (P<0.001), had suicidal ideation (P=0.032), and perceived themselves as obese (P=0.005) frequently skipped dinner.

The frequency of dining out was significantly associated with education, economic status, marital status, economic activity, and household structure. Those who were more educated (P=0.008), with a higher economic status (P<0.001), and unmarried (P<0.001) frequently dined out at least three times a week. Among men, the married group than the

single group (P<0.001) and those without anxiety/depression (P=0.046) frequently dined out.

Use of dietary supplements and use of nutrition labels

In women, the use of dietary supplements was higher among those with higher education (P<0.001), married (P<0.001), and who lived alone (P=0.029) and in men, it was higher among those with higher economic status (P=0.012), who perceived themselves as being in good health (P=0.045), and who were not current smokers (38.1%) than those who were current smokers (22.1%) (P<0.001). Moreover, it was higher among individuals who had sufficient food to eat than among those who did not (17.1%) (P=0.009).

The percentage of women who did not use nutrition labels was significantly higher among those who did not engage in weight control (P<0.001). Among men, it was high among those who did not smoke (P=0.007) and those who engaged in weight control (P<0.001). In both sexes, individuals who perceived themselves as normal or obese more frequently used nutrition labels (P<0.001), and it was higher among individuals who had prior nutrition education (women, P=0.002; men, P=0.029).

Women with more physical activity (P=0.030) and those who perceived themselves as obese (P=0.004) and men with a higher level of stress (P=0.010) claimed to be more influenced by nutrition labels in their food choices.

Predictors of eating behaviors in young adults by sex

Tables 1 and 2 show the predictors of eating behavior in young women and men. The odds for skipping breakfast was 2.359 times higher and 2.429 times higher among female and male single-person households, respectively. Dining-out frequency was predicted by marital status, economic activity, and household structure in both sexes. The use of dietary supplements was predicted by smoking status, while the use of nutrition labels was predicted by perceived body image in both sexes.

The odds of breakfast skipping were 1.485 times higher among women with "moderate" perceived health status and 1.638 times higher among women with "bad" perceived health status compared to women with "good" perceived health. In men, the odds for breakfast skipping were 2.038 times higher among married men and 1.864 times higher among current smokers. Lunch skipping was not predicted by any of the variables in women, but in men, the odds for lunch skipping was 5.533 times higher in men with a middle school diploma or lower and 2.677 times higher than those with a high school diploma than those with a bachelor's degree of higher. Moreover, the odds for lunch skipping were 3.447 times higher among men with poor diet-related circumstances than among those with adequate diet-related circumstances.

The odds for dinner skipping were lower among economically inactive women than economically active women, and in men, the odds for dinner skipping were 4.450 times higher among those who perceived themselves as obese.

Among the eating behaviors studied in this study, dining out frequency in women was influenced by the greatest number of factors. Dining out frequency was 2.104 times higher among those in a "high" economic status than "low" economic status, 3.164 times higher among those who are economically active, 1.457 times higher among those who perceive themselves to be thin, and 2.330 times higher among those with adequate diet-related circumstances.

Table 1: Effect factors of eating behaviors in female young adults

Characteristics		*Categories*	*Dietary behaviors*													
			Breakfast frequency (times/week)		Lunch frequency (times/week)		Dinner frequency (times/week)		Frequency of eating out (times/week)		Taking dietary supplements		Use nutrition label		Nutritional labeling effects	
			OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female (n=2,502)																
Socio-demographic	Education (ref: ≥university)	≤Middle	1.101	0.482~2.516					1.425	0.581~3.495	0.871	0.257~2.952				
		High	0.809	0.639~1.025					0.612	0.465~0.805	1.655	0.980~2.795				
	Economic status (ref: high)	Low							2.104	1.435~3.086						
		Medium							1.37	0.960~1.955						
	Marriage (ref: no)	Yes							3.162	2.356~4.243	0.51	0.290~0.897				
	Economic activity (ref: yes)	No	0.861	0.681~1.090			0.414	0.190~0.899	3.164	2.428~4.124						
	Household type (ref: Multi-person)	One-person	2.359	1.454~3.830					0.403	0.208~0.782	0.568	0.261~1.237				
Physical health	physical activity (MET-min/week) (ref: high)	None	0.795	0.388~1.626			1.371	0.325~5.787							0.749	0.237~2.363
		Medium	0.613	0.319~1.179			1.789	0.393~8.151							0.519	0.188~1.435
	Subjective health status (ref: good)	Moderate	1.485	1.160~1.901												
		Bad	1.638	1.153~2.328												
	Current smoking(ref:no)	Yes									1.811	1.081~3.033				
	Drinking Frequency for one year (per	2~3 times	1.363	0.959~1.936					0.548	0.365~0.822						
		3 ≥4	1.936	0.964~3.888					0.377	0.160~0.888						

	week) (ref: ≤4 times per mon)	times														
	Weight control for one year (ref: no)	Yes					2.605	0.980~ 6.920					0.398	0.309~ 0.514	0.766	0.445~ 1.319
Mental health	Anxiety/Depression (ref: no)	Yes											0.698	0.501~ 0.973		
	Stress (ref: hardly)	2A little			0.633	0.226~ 1.777			0.538	0.340~ 0.849						
		A lot			1.58	0.584~ 4.278			0.583	0.362~ 0.940						
	Suicidal ideation (ref: no)	Yes					2.556	0.907~ 7.200								
	Subjective body recognition (ref: skinny)	Moderate	0.829	0.599~ 1.147			1.033	0.301~ 3.548	1.051	0.720~ 1.533			0.621	0.452~ 0.853	0.515	0.287~ 0.922
		Obesity	1.063	0.777~ 1.456			2.016	0.616~ 6.590	1.457	1.012~ 2.098			0.646	0.473~ 0.882	0.42	0.236~ 0.748
Nutrition	Nutrition education (ref: yes)	No											2.525	1.426~ 4.470		
	Eating circumstance (ref: enough)	Lack of			2.591	0.940~ 7.137			2.23	1.017~ 4.885						

Table 2: Effect factors of eating behaviors in male young adults

Characteristics	***Categories***	***Dietary behaviors***											
		Breakfast frequency (times/week)		**Lunch frequency (times/week)**		**Dinner frequency (times/week)**		**Frequency of eating out (times/week)**		**Taking dietary supplements**		**Use nutrition label**		**Nutritional labeling effects**	
		OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Male (n=2,101)															

Socio-demographic	Education (ref: ≥university)	≤Middle			5.533	1.302~23.520										
		High			2.677	1.192~6.014										
	Economic status (ref: high)	Low	1.216	0.770~1.920							1.449	0.894~2.346	1.063	0.664~1.703		
		Medium	1.134	0.766~1.678							1.314	0.871~1.984	1.596	1.048~2.431		
	Marriage (ref: no)	Yes	2.038	1.148~3.616					0.302	0.121~0.749						
	Economic activity (ref: yes)	No	0.846	0.624~1.147					1.969	1.483~2.613						
	Household type (ref: Multi-person)	One-person	2.429	1.547~3.812	0.334	0.074~1.516			0.243	0.137~0.432						
Physical health	physical activity (MET-min/week) (ref: high)	None														
		Medium														
	Subjective health status (ref: good)	Moderate	1.127	0.789~1.611							0.931	0.642~1.351				
		Bad	1.106	0.670~1.823							1.238	0.685~2.237				
	Current smoking (ref: no)	Yes	1.864	1.318~2.637							2.062	1.439~2.953	1.545	1.084~2.204	2.822	1.222~6.517
	Drinking Frequency for one year (per week) (ref: ≤4 times per mon)	2~3 times	1.307	0.909~1.878									1.277	0.824~1.978		
		3≥4 times	1.48	0.763~2.872									1.84	0.818~4.141		

	Weight control for one year (ref: no)	Yes	1.007	0.728~1.394					1.452	1.070~1.969	0.858	0.577~1.277	0.479	0.323~0.712	0.639	0.283~1.442
Mental health	Anxiety/Depression (ref: no)	Yes							1.481	0.898~2.442						
	Stress (ref: hardly)	A little	1.217	0.758~1.956											0.559	0.197~1.582
		A lot	1.486	0.857~2.576											0.278	0.084~0.920
	Subjective body recognition (ref: skinny)	Moderate					3.207	0.815~12.614					0.697	0.419~1.158		
		Obesity					4.45	1.202~16.478					0.55	0.343~0.882		
Nutrition	Nutrition education (ref: yes)	No											2.484	0.955~6.464		
	Eating circumstance (ref: enough)	Lack of			3.447	1.258~9.443					13.644	1.779~104.623				

In men, the dining out frequency was 1.969 times higher among those who were economically active and 1.452 times higher among those who did not engage in weight control effort, but lower among single men than married men and multi-person households. However, single women had 3.162 times higher odds of eating out compared to married women, showing that marital status was the only factor that affected dining out frequency in both sexes but in the opposite direction.

The use of dietary supplements was lower among unmarried women. It was 13.644 times higher among men with adequate diet-related circumstances. The use of nutrition labels was 2.525 times higher among women with prior nutrition education and lower among individuals who were not engaged in weight control efforts, with no anxiety/depression, and who perceived themselves to be thin. In men, the use of nutrition labels was 1.596 times higher among those in "high" economic status than "medium" economic status, 1.545 times higher among non-current smokers, and 0.479 times lower among those who did not engage in weight control effort.

Women who perceived themselves as thin were less influenced by nutrition labels in their food choices than those who perceived themselves to be normal or obese. In men, non-current smokers were 2.822 times more influenced, while the "no" stress group was less influenced by nutrition labels in their food choices.

Discussion

This study analyzed the differences in eating behaviors and the effects of different factors on eating behaviors among young men and women in their 20s. In women, breakfast skipping, dinner skipping, eating out frequency, nutrition label use, and influence of nutrition label mostly differed according to their perceived body image. Meanwhile, in men, breakfast skipping, use of supplements, nutrition label use, and influence of nutrition labels differed according to the current smoking status and weight control efforts in the past year.

In the United States, 60% of young adults frequently skip breakfast (6). In Korea, a similar trend is emerging since 2013 (7). Breakfast lowers the risk of chronic diseases by increasing the intake of required nutrients while decreasing the intake of high-energy foods (8). Women are at a higher risk for cardiovascular disease (CVD) than men when they eat breakfast ≤2 times per week (7). In the present study, women who perceived themselves to be in poor health or obese skipped breakfast frequently, and this may be attributable to extreme dieting by skipping meals.

The frequency of dining out was consistently higher among single-person households than multi-person households. Dining out was higher in women who were not married but higher in men who were married. In Korean society, single women have more personal time compared to their married counterparts and thus can dine out more frequently. Contrastingly, married men are less tied to their homes compared to married women and are more frequently involved in company dinners and social activities with friends. A study on the dining out frequency in Korea from 2010 to 2015 (9) observed that it is positively correlated with young people, singles, employed, urban dwellers, people with high income, people with higher education, and male sex. This is consistent with the results of a large study conducted on ten European countries (10).

Family structures in Korea are rapidly evolving from traditional nuclear families to single-parent households, multicultural households, and single-person households because of social and economic changes (11). In our study, increase in skipping breakfast and frequency of dining out consistently observed across men and women highlights the urgency of implementing intervention programs that improve the eating behaviors of young adults living alone.

In women, effects of sociodemographic, physical health, mental health, and nutrition-related factors primarily predicted the frequency of dining out. However, in men, they predicted a variety of eating behaviors, including breakfast skipping, nutrition label utilization, and eating out. The factors associated with eating out reported that men, as opposed to women (12), younger populations, as opposed to older populations, and individuals with a higher income and education (13) dined out frequently.

In our study, varying sociodemographic factors predicted eating behaviors between men and women such as skipping meals, eating out, and taking dietary supplements. Among the physical health factors, current smoking status predicted most of the eating behaviors in men, including breakfast skipping, use of supplements, and nutrition label use and influence on eating behavior. Smoking had a greater impact on overall eating behaviors in men than in women. According to a nationally representative survey in Korea, adolescents from low-income families with less educated fathers are likely to initiate smoking and drinking at an early age (14). In a study on college students, poor dietary habits were closely associated with smoking (15), consistent with our findings. However, smoking is not associated with eating behaviors (16) hence the association between the two cannot be definitively concluded.

Dietary habits influence an individual's physical health, psychological state, and emotional stability (17). In our study, anxiety/depression, stress, and perceived body image had varying effects on eating behaviors between men and women, and these factors predicted nutrition label use in both sexes. Particularly, perceived body image was identified as a key mental health factor that predicted eating out in women and dinner skipping in men. Young women are more vulnerable to developing poor

dietary habits because they tend to consider themselves overweight and are too focused on losing weight without accurate nutrition-related information (18).

Prior nutrition education predicted nutrition label use only in women, and diet-related circumstances predicted eat-out frequency in women and lunch skipping and use of dietary supplements in men. Female college students' use of nutrition labels is influenced by their nutrition knowledge and that lack of time is a major barrier to the use of nutrition labels (19) are consistent with our findings. Thus, nutrition educational interventions should be implemented to impart nutrition-related knowledge to boost people's use of nutrition labels (20). In our study, the use of nutrition labels and dietary supplement use were influenced by prior nutrition education and diet-related circumstances, and we predict that such behaviors among young adults would have a greater impact on their health outcomes in middle or older adulthood.

This study had a few limitations. Although the KNHANES is a nationally representative, credible data, each outcome variable was measured using a single item, which hindered the examination of comprehensive eating behaviors. Further, the data were obtained only from the Korean population; therefore, our findings have limited international generalizability. Replication studies should be conducted to identify the predictors of eating behaviors in young adults using a tool that enables the examination of comprehensive eating behaviors.

Conclusion

Several factors markedly influenced the eat-out frequency in women, while they affected a variety of eating behaviors, including breakfast skipping, eat-out frequency, and use of nutrition labels in men. Sex-specific interventions should be developed based on these findings to improve the eating behaviors of young women and men in their 20s tailored to household structures.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Acknowledgements

This work was supported by a National Research Foundation of Korea (NRF) grant funded by the Korean government (Ministry of Science and ICT), (NRF-2019R1G1A1099206).

Conflict of interest

The authors declare that there is no conflict of interests.

References

1. Kim HJ, Lee AR, Kim KW (2016). Perception on optimal diet, diet problems and factors related to optimal diet among young adult women using focus group interviews - based on social cognitive theory. *Korean J Community Nutr,* 21 (4): 332-43.
2. Watts AW, Rydell SA, Eisenberg ME, et al (2018). Yoga's potential for promoting healthy eating and physical activity behaviors among young adults: a mixed-methods study. *Int J Behav Nutr Phys Act,* 15 (1): 42.
3. Gan WY, Nasir, MTM, Shariff ZM, Saad HA (2011). Disordered eating behaviors, depression, anxiety and stress among Malaysian university students. *Coll Student J,* 45 (2): 296-309.
4. Turel T, Jameson M, Gitimu P, et al (2018). Disordered eating: Influence of body image, sociocultural attitudes, appearance anxiety and depression - a focus on college males and a gender comparison. *Cogent Psychology*, 5 (1): 1483062.
5. World Health Organization. Global Physical Activity Questionnaire (GPAQ)—analysis guide. https://www.who.int/publications/m/item/global-physical-activity-questionnaire

6. Deshmukh-Taskar PR, Nicklas TA, O'Neil CE, Keast DR, Radcliffe JD, Cho S (2010). The relationship of breakfast skipping and type of breakfast consumption with nutrient intake and weight status in children and adolescents: the National Health and Nutrition Examination Survey 1999–2006. *J Am Diet Assoc,* 110 (6): 869-78.
7. Lee HJ, Jang J, Lee SA, et al (2019). Association between breakfast frequency and atherosclerotic cardiovascular disease risk: a cross-Sectional study of KNHANES data, 2014–2016. *Int J Environ Res Public Health,* 16 (10): 1853.
8. Deshmukh-Taskar P, Nicklas TA, Radcliffe JD, et al (2013). The relationship of breakfast skipping and type of breakfast consumed with overweight/obesity, abdominal obesity, other cardiometabolic risk factors and the metabolic syndrome in young adults. The National Health and Nutrition Examination Survey (NHANES): 1999–2006. *Public Health Nutr,* 16 (11): 2073-82.
9. Ju SY (2020). Changes in eating-out frequency according to sociodemographic characteristics and nutrient intakes among Korean adults. *Iran J Public Health,* 49 (1): 46-55.
10. Orfanos P, Naska A, Trichopoulos D et al (2007). Eating out of home and its correlates in 10 European countries. The European Prospective Investigation into Cancer and Nutrition (EPIC) study. *Public Health Nutr*, 10 (12): 1515-25.
11. Kang NY, Jung BM (2019). Analysis of the difference in nutrients intake, dietary behaviors and food intake frequency of single- and non-single-person households: the Korea National Health and Nutrition Examination Survey (KNHANES), 2014–2016. *Korean J Community Nutr* 24 (1): 1-17.
12. Bezera IN, Sichieri R (2009). Eating out of home and obesity: a Brazilian nationwide survey. *Public Health Nutr,* 12 (11): 2037-43.
13. Bes-Rastrolo M, Bastera-Gortari FJ, Sánchez-Vilegas A, et al (2010). A prospective study of eating away-from-home meals and weight gain in a Mediterranean population: the SUN (Seguimiento Universidad de Navara) cohort. *Public Health Nutr* 13 (9): 1356-63.
14. Valencia MLC, Tran BT, Lim MK, et al (2019). Association between socioeconomic status and early initiation of smoking, alcohol drinking, and sexual behavior among Korean adolescents. *Asia Pac J Public Health*, 31 (5): 443-53.
15. Sprake EF, Russell JM, Cecil JE, et al. (2018). Dietary patterns of university students in the UK: a cross-sectional study. *Nutr J*, 17 (1): 90.
16. Scioli ER, Biller HB, Rossi JS, Riebe D, Scioli A (2009). Interrelationships of exercise, nutrition and smoking behaviors among college students. *Californian Journal of Health Promotion*, 7 (S1): 7-22.
17. Park HE, Bae YH (2016). Eating habits in accordance with the mental health status: The 5th Korea National Health and Nutrition Examination Survey, 2010-2012. *Journal of the Korea Academia-Industrial cooperation Society*, 17 (10): 168-81.
18. Davy SR, Benes BA, Driskel JA (2006). Sex differences in dieting trends, eating habits, and nutrition beliefs of a group of Midwestern college students. *J Am Diet Assoc,* 106 (10):1673-677.
19. Al-Barqi R, Al-Salem Y, Mahrous L, et al (2020). Understanding barriers towards the use of food labels among Saudi female college students. *Malaysian Journal of Nutrition*, 26 (1): 019-030.
20. Soederberg Miller LM, Sutter C, Wilson MD, et al (2019). Assessment of an e-training tool for college students to improve accuracy and reduce effort associated with reading nutrition labels. *J Am Coll Health*, 67 (5): 441-8.