Article

The Association between Eating-Out Rate and BMI in Korea

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Abstract: Previous research suggests that adult men consume larger amounts of calories while eating-out than when eating meals prepared at home. Therefore, this study aimed to investigate the association between the daily eating-out rate and body mass index (BMI) in the Korean population. The study used data from 18,019 individuals aged ≥19 years who participated in the Korea National Health and Nutrition Examination Survey (KNHANES) from 2013 to 2016. BMI was measured according to the Asia-Pacific BMI measurement criteria. A multinomial logistic regression analysis was used to examine the validity of the association between the eating-out rate and BMI. In this population, women with higher eating-out rates were found to have higher BMIs. Specifically, the risks of becoming obese or overweight increased among those with a 1%–50% (obesity odds ratio (OR) = 1.28, 95% confidence interval [CI]: 1.09–1.51; overweight OR = 1.38, 95% CI: 1.14–1.64) or 51%–100% daily eating-out rate (obesity OR = 1.51, 95% CI: 1.24–1.84; overweight OR = 1.50, 95% CI: 1.20–1.87), relative to those who reported never eating-out. By contrast, no statistically significant association between the daily eating-out rate and BMI was observed among men. Notably, we observed positive associations of the daily eating-out rate with obesity and being overweight in South Korean women, but not men. Our findings suggest that education about proper habits when eating-out is needed to prevent obesity.

Keywords: BMI; obesity; overweight; eating-out rate; Korea National Health and Nutrition Examination Survey

1. Introduction

According to a survey conducted by the World Health Organization (WHO), the proportion of obese individuals worldwide has increased by approximately three-fold from 1975 to 2016 [1]. Although obesity is a non-communicable disease, the ever-increasing population of affected individuals has become a global issue [2–4], particularly as the WHO has reported that the health consequences of obesity, particularly chronic diseases and death, are as deleterious as those of smoking [5]. Consistent with global trends, the rate of obesity is steadily increasing in South Korea. The 2016 version of the Korea National Health and Nutrition Examination Survey (KNHANES) determined an obesity rate of approximately 30% [6], and predictions suggest that the social problems caused by obesity will soon become extreme. Although obesity does not have specific symptoms, it has been correlated with cardiovascular disease, hypertension, type II diabetes, musculoskeletal disorders, and some types of cancer [7–11]. Therefore, it is equally important to prevent and treat/manage obesity [12–14].

Modern occupational shifts to more knowledge-based production industries [15] have led to relative decreases in opportunities for physical activity. This is certainly true in South Korea, where much of the working population remains seated during working hours [16]. Recent years have also seen an
increase in the amount of appetite-stimulating media, such as cooking shows and restaurant reviews. Simultaneously, an increasing number of people show they prefer to eat out than at home. In Korea, this phenomenon has been demonstrated by increases in both the frequency of eating-out and the decreased proportion of household expenditure on food purchases. For example, the frequency of eating-out increased from 23.6% in 1990 to 45.1% in 2015 in Korea, while the proportion of household expenditure on food decreased from 76.4% to 54.9% [8,9,17].

According to a previous study of the lunchtime consumption habits of adult men, greater amounts of calories were consumed when eating-out than when eating lunch at home [18]. This led us to speculate on a potential connection between the increased frequency of eating-out and the increasing incidence of overweightness/obesity in Korea, using the body mass index (BMI) as an indicator. Such a correlation might be a main factor affecting the incidence and prevention of obesity.

We expected this phenomenon to be observed equally due to the increasingly Western-style Korean eating-out culture. Therefore, this study was conducted to investigate the relationship between daily eating-out rate and BMI among Koreans.

2. Materials and Methods

2.1. Data Collection and Study Participants

The KNHANES is a cross-sectional survey of a nationally representative, all-age population conducted annually by the Korea Centers for Disease Control and Prevention (KCDC) since 1998. From among the 31,098 respondents to the 2013–2016 KNHANES, we selected only adult respondents aged 19 years or older (n = 24,095).

We used two-stage filtering to extract participants who responded to a question related to the frequency of eating-out. First, we classified participants as obese, overweight, underweight, or normal weight according to the BMI classification (n = 22,883). Second, the average number of meals per day was calculated as the average of number of breakfasts, lunches, and dinners consumed, and the daily frequency of eating-out was stratified as “more than twice per day,” “less than once per day (1 to 24 times per month),” and “none (less than once per month).”

The frequency of daily meals may vary from person to person. We focused on eating-out rates for a more detailed analysis. Therefore, we calculated the daily eating-out rate as the frequency of eating-out per day/daily food intake rate per day (n = 19,704). Additional details are provided in the next section.

We excluded participants for whom the following data were missing: Marital status (n = 31), household income (n = 92), educational level (n = 1482), occupation (n = 29), and physical activity (n = 51). Therefore, a final sample population of 18,019 people was included in our study analysis.

The Korea National Health and Nutrition Examination Survey (KNHANES), which we used, corresponds to the research conducted by the government for public welfare in accordance with the Korea Bioethics Act. Therefore, it was possible to conduct this investigation without consideration of the research ethics review committee.

2.2. Variables

Our independent variable was the daily rate of eating-out. Because the KNHANES did not include variables that could be used to calculate this rate, we generated an average rate of eating-out. First, the average number of meals per day was determined from responses to the question, “How many times a week did you eat breakfast (lunch, dinner) in the last year?” The possible answers were 5–7, 3 or 4, 1 or 2, or no times per week. Subsequently, we divided the results by 7 to calculate the average number of meals. Through those three indicators, we divided into groups, those that had meals once a day, a group that eats twice a day, and a group that eats more than three times a day. Second, the question used to determine the frequency of eating-out and set the variable of interest was, “On average, during the past year, how often did you eat out rather than home-cooked food?” This item had 7
possible responses: More than twice per day, once per day, 5 or 6 times per week, 3 or 4 times per week, 1 or 2 times per week, 1–3 times per month, and never (less than once per month). Because the answers to this question differed, we sorted the respondents using the following reset criteria: more than twice per day, less than once per day (once per day, 5–6 times per week, three to four times per week, 1 to 2 times per week, 1–3 times per month), and never (less than once per month). The daily rate of eating-out was calculated using the following formula: Daily eating-out frequency/daily eating frequency × 100.

The BMI status was set as the dependent variable. We generated these data based on the following Asia-Pacific BMI standards: Normal, 18.5–22.9 kg/m²; underweight, <18.5 kg/m²; overweight, 23–24.9 kg/m²; and obese, ≥25 kg/m².

2.3. Covariates

The sociodemographic factors of sex (men, women), age (20–29, 30–39, 40–49, 50–59, 60–69, ≥70 years), and the socioeconomic factors of marital status (unmarried, married, and once married (divorced, separated, or widowed)), monthly household income (high, medium, medium-high, and medium-low, low), educational level (elementary school or less, middle school, high school, and college or higher), and occupation (workers and non-workers) were included. Health-related behaviors were categorized as follows: Smoking status (yes, no), alcohol status (yes, no). Daily energy intake was determined using the recommendations for energy intake by sex and age published by the Ministry of Health and Welfare in 2015 [19]. According to Korean energy intake standards, the recommended energy intake varied according to age, sex, and pregnancy. Therefore, we calculated the recommended nutrient intake to be in the range of ±100 kcal to determine whether the nutrient intake was appropriate or not. Physical activity to the ACSM guideline was determined using data regarding the frequency of physical activity participation. The time, frequency, and intensity of exercise were taken into consideration to conduct a more detailed analysis of the physically active (vigorous physical activity once per week for 20 min or more, 3 days a week or more, or moderate physical activity or walking exercise performed once for more than 30 min per week for 3 days or more) and non-active groups [20]. Finally, diabetes is closely related to obesity [21,22]. Therefore, we added diabetes as a covariate. Diabetes-related items were stratified by the clinical (i.e., physician’s) diagnostic or non-diagnostic status.

2.4. Statistical Analysis

The chi-square test was used to examine significant differences in BMI depending on the eating-out rate. We also used multinomial logistic regression because we had four dependent variables (obesity, overweight, underweight, and normal weight). Multinomial logistic regression is used when the dependent variable in question is nominal (equivalently categorical, meaning that it falls into any one of a set of categories that cannot be ordered in any meaningful way) and for which there are more than two categories. That method is a particular solution to classification problems that use a linear combination of the observed features and some problem-specific parameters to estimate the probability of each particular value of the dependent variable. Multinomial logistic regression analysis was used to determine odds ratios (ORs) and 95% confidence intervals (CIs) after adjusting for covariates. Additionally, subgroup analyses according to the eating-out rate and BMI were conducted. For all data analysis, we used SAS version 9.4 (SAS Institute, Cary, NC, USA) and the significance level was set at p-value < 0.05.

3. Results

3.1. Study Participants

Table 1 lists the general characteristics of the study population, stratified by sex. Approximately 90% of Koreans reported some frequency of eating-out. On the other hand, 517 men (7.2%) and 1147
women (10.6%) answered that they do not eat out at all. Among the respondents who said that they eat out, 5061 men (70.1%) and 7,658 women (71.0%) were included in the eating-out rate of 1%–50%. Within the category of a 51%–100% rate of eating-out, 1657 (22.8%) were men and 1989 (18.4%) were women. Although similar proportions of men and women comprised the 1%–50% group, the distribution in the 51%–100% group indicated a greater exposure to eating-out among men than among women. Among male participants, 2769 (38.3%), 1878 (25.9%), 208 (2.81%), and 2375 (32.9%) met the BMI criteria for obesity, overweight, underweight, and normal weight, respectively. Among female participants, 3230 (29.9%), 2327 (21.5%), 525 (4.9%), 4,712 (43.7%) met the BMI criteria for obesity, overweight, underweight, and normal weight, respectively. Among the subgroup of women who reported never eating-out, 37.8%, 22.5%, 3.6%, and 36.1% met the criteria for obesity, overweight, underweight, and normal weight, respectively. Among the subgroup of men who reported never eating-out, 29%, 25.5%, 7.5%, and 37.9% met the criteria for obesity, overweight, underweight, and normal weight, respectively. For men with a rate of eating-out of 1%–50%, the corresponding values were 1927 (38%), 1332 (26.3%), 117 (2.3%), and 1685 (33.3%), respectively, while among those with a rate of eating-out of 51%–100%, the corresponding values were 692 (42.0%), 414 (25.0%), 47 (2.9%), and 494 (30.0%), respectively. For women with a rate of eating-out of 1%–50%, the corresponding values were 2,260 (29.5%), 1686 (22.0%), 352 (4.6%), 3360 (43.9%), respectively, while among those with a rate of eating-out of 51%–100%, the corresponding values were 536 (27.0%), 383 (19.3%), 132 (6.6%), 938 (47.2%), respectively. In summary, approximately 60% of the men in each group exceeded the normal weight category, regardless of their rate of eating-out. Approximately 50% of the women in each group exceeded the normal weight category, regardless of their rate of eating-out.

3.2. Factors Associated with Eating-out Rate and BMI

Table 2 presents the results of factors associated with the frequency of eating-out and the BMI. A multinomial logistic regression analysis corrected for covariance revealed a significant correlation between the eating-out rate and BMI only among women. In this group, the likelihood of becoming obese or overweight was higher among those with a daily eating-out rate of 1%–50% (obesity OR = 1.28, 95% CI: 1.09–1.51; overweight OR = 1.38, 95% CI: 1.14–1.64) or 51%–100% (obesity OR = 1.51, 95% CI: 1.24–1.84; overweight OR = 1.50, 95% CI: 1.20–1.87) relative to those who reported never eating-out. It is also analyzed that people with diabetes are more likely to be obese (men's obesity OR = 1.53, 95% CI: 1.27–1.84; women's obesity OR = 1.65, 95% CI: 1.39–1.96).

3.3. Association between BMI and Eating-out Rate by Socioeconomic Status

Table 3 presents the results of a subgroup analysis stratified by socioeconomic status. Among men, those who were married and had a daily eating-out rate of 51%–100% were 1.44 times more likely to be obese. Among women, those who were married and had a daily eating-out rate of 1%–50% were 1.30 times more likely to be obese. Furthermore, those with a low household income and those with an education level of less than elementary school were 1.34 and 1.27 times more likely to be obese, respectively. In the analysis of occupation, the probability of obesity for women with and without occupation increased by 1.38 times and 1.24 times, respectively, regardless of occupation. Among those with a daily eating-out rate of 51%–100%, married women were 1.56 times more likely to become obese, and those with a low household income were 1.49 times more likely to be obese. In the analysis of occupation, the probability of obesity for women with and without occupations increased by 1.44 times and 1.67 times.
| Variable          | Men                  | p-Value | Women                 | p-Value |
|------------------|----------------------|---------|-----------------------|---------|
| Daily eating-out rate |                     | <0.0001 |                      | <0.0001 |
| None             | 517 7.2 150 29.0 132 25.5 39 7.5 196 37.9 |         | 1147 10.6 434 37.8 258 22.5 41 3.6 414 36.1 |
| 1%–50%           | 5061 70.1 1927 38.1 1332 26.3 117 2.3 1685 33.3 |         | 7658 71.0 2260 29.5 1686 22.0 352 4.6 3360 43.9 |
| 51%–100%         | 1647 22.8 692 42.0 414 25.1 47 2.9 494 30.0 |         | 1989 18.4 536 27.0 383 19.3 132 6.6 938 47.2 |
| Age              |                      |         |                      |         |
| 20–29            | 777 10.8 260 33.5 159 20.5 35 4.5 323 41.6 |         | 1071 9.9 161 15.0 133 12.4 155 14.5 622 58.1 |
| 30–39            | 1065 14.7 500 47.0 258 24.2 20 1.9 287 27.0 |         | 1892 17.5 380 20.1 294 15.5 155 8.2 1063 56.2 |
| 40–49            | 1262 17.5 550 43.6 332 26.3 18 1.4 362 28.7 |         | 2023 18.7 516 25.5 432 21.4 90 4.5 985 48.7 |
| 50–59            | 1335 18.5 556 41.7 384 28.8 28 2.1 367 27.5 |         | 2127 19.7 708 33.3 520 24.5 43 2.0 856 40.2 |
| 60–69            | 1437 19.9 524 36.5 395 27.5 31 2.2 487 33.9 |         | 1827 16.9 733 40.1 489 26.8 25 1.4 580 31.8 |
| ≥70              | 1349 18.7 379 28.1 350 26.0 71 5.3 549 40.7 |         | 1854 17.2 732 39.5 459 24.8 57 3.1 606 32.7 |
| Marital status   |                      |         |                      |         |
| Unmarried        | 1180 16.3 437 37.0 246 20.9 47 4.0 450 38.1 |         | 1186 11.0 185 15.6 139 11.7 171 14.4 691 58.3 |
| Married          | 5538 76.7 2155 38.9 1499 27.1 132 2.4 1752 31.6 |         | 7477 69.3 2230 29.8 1673 22.4 289 3.9 3285 43.9 |
| Once married (divorced, separated, bereavement) | 507 7.0 177 34.9 133 26.2 24 4.7 173 34.1 |         | 2131 19.7 815 38.2 515 24.2 65 3.1 736 34.5 |
| Household income |                      |         |                      |         |
| Low              | 1357 18.8 438 32.3 335 24.7 67 4.9 517 38.1 |         | 2270 21.0 886 39.0 551 24.3 73 3.2 760 33.5 |
| Medium-Low       | 1824 25.3 693 38.0 451 24.7 56 3.1 624 34.2 |         | 2710 25.1 906 33.4 593 21.9 126 4.7 1085 40.0 |
| Medium-High      | 1974 27.3 811 41.1 502 25.4 50 2.5 611 31.0 |         | 2863 26.5 804 28.1 575 20.1 137 4.8 1347 47.1 |
| High             | 2070 28.7 827 40.0 590 28.5 30 1.5 623 30.1 |         | 2951 27.3 634 21.5 608 20.6 189 6.4 1520 51.5 |
| Educational level|                      |         |                      |         |
| Elementary school| 1325 18.3 422 31.9 346 26.1 64 4.8 493 37.2 |         | 3087 28.6 1334 43.2 785 25.4 69 2.2 899 29.1 |
| Middle school    | 823 11.4 297 36.1 225 27.3 28 3.4 273 33.2 |         | 1116 10.3 415 37.2 278 24.9 20 1.8 403 36.1 |
| High school      | 2477 34.3 966 39.0 604 24.4 63 2.5 844 34.1 |         | 3309 30.7 888 26.8 715 21.6 166 5.0 1540 46.5 |
| College or more  | 2600 36.0 1084 41.7 703 27.0 48 1.9 765 29.4 |         | 3282 30.4 593 18.1 549 16.7 270 8.2 1870 57.0 |
| Occupation       |                      |         |                      |         |
| Workers          | 5117 70.8 2085 40.8 1347 26.3 103 2.0 1582 30.9 |         | 5179 48.0 1440 27.8 1096 21.2 267 5.2 2376 45.9 |
| Non-workers      | 2108 29.2 684 32.5 531 25.2 100 4.7 793 37.6 |         | 5615 52.0 1790 31.9 1231 21.9 238 4.6 2336 41.6 |
Table 1. Cont.

| Variable                      | Men                                      | p-Value | Women                                 | p-Value |
|-------------------------------|------------------------------------------|---------|---------------------------------------|---------|
|                               | Total Obesity | Overweight | Underweight | Normal | p-Value | Total Obesity | Overweight | Underweight | Normal | p-Value |
|                               | N (%)         | N (%)      | N (%)       | N (%)  | N (%)   | N (%)         | N (%)      | N (%)       | N (%)  | N (%)   |
| Smoking                       |               |            |             |        |         |               |            |             |        |         |
| Yes                           | 2230          | 30.9       | 866         | 38.8   | 528     | 23.7          | 360        | 3.3         | 120    | 33.3   | 63       | 17.5   | 29        | 8.1    | 148       | 41.1   |
| No                            | 4995          | 69.1       | 1903        | 38.1   | 1350    | 27.0          | 10,434     | 96.7        | 3110   | 29.8   | 2264     | 21.7   | 496       | 4.8    | 4564      | 43.7   |
| Alcohol consumption           |               |            |             |        |         |               |            |             |        |         |         |       |           |       |           |        |
| Yes                           | 5046          | 69.8       | 1975        | 39.1   | 1331    | 26.4          | 4172       | 38.7        | 1144   | 27.4   | 780      | 18.7   | 207       | 5.0    | 2041      | 48.9   |
| No                            | 2179          | 30.2       | 794         | 36.4   | 547     | 25.1          | 6622       | 61.4        | 2086   | 31.5   | 1547     | 23.4   | 318       | 4.8    | 2671      | 40.3   |
| Daily energy intake           |               |            |             |        |         |               |            |             |        |         |         |       |           |       |           |        |
| Less than recommended energy  | 3055          | 42.3       | 1144        | 37.5   | 770     | 25.2          | 5369       | 49.7        | 1624   | 30.3   | 1163     | 21.7   | 271       | 5.1    | 2311      | 43.0   |
| intake per day                |              |             |             |        |         |               |            |             |        |         |         |       |           |       |           |        |
| Recommended energy intake     | 1373          | 19.0       | 496         | 36.1   | 373     | 27.2          | 2456       | 22.8        | 732    | 29.8   | 516      | 21.0   | 110       | 4.5    | 1098      | 44.7   |
| per day                       |              |             |             |        |         |               |            |             |        |         |         |       |           |       |           |        |
| More than recommended energy  | 2797          | 38.7       | 1129        | 40.4   | 735     | 26.3          | 2969       | 27.5        | 874    | 29.4   | 648      | 21.8   | 144       | 4.9    | 1303      | 43.9   |
| intake per day                |              |             |             |        |         |               |            |             |        |         |         |       |           |       |           |        |
| Physical activity             |               |            |             |        |         |               |            |             |        |         |         |       |           |       |           |        |
| Yes                           | 3630          | 50.2       | 1390        | 38.3   | 961     | 26.5          | 4697       | 43.5        | 1335   | 28.4   | 1002     | 21.3   | 214       | 4.6    | 2146      | 45.7   |
| No                            | 3595          | 49.8       | 1379        | 38.4   | 917     | 25.5          | 6097       | 56.5        | 1895   | 31.1   | 1325     | 21.7   | 311       | 5.1    | 2566      | 42.1   |
| Diabetes mellitus             |               |            |             |        |         |               |            |             |        |         |         |       |           |       |           |        |
| Yes                           | 6415          | 88.8       | 2429        | 37.9   | 1664    | 25.9          | 9871       | 91.5        | 2795   | 28.3   | 2104     | 21.3   | 515       | 5.2    | 4457      | 45.2   |
| No                            | 810           | 11.2       | 340         | 42.1   | 214     | 26.4          | 923        | 8.6         | 435    | 47.1   | 223      | 24.2   | 10        | 1.1    | 255       | 27.6   |
| Total                         | 7225          | 100.0      | 2769        | 38.3   | 1878    | 26.0          | 10,794     | 100.0       | 3230   | 29.9   | 2327     | 21.6   | 525       | 4.9    | 4712      | 43.7   |
Table 2. Factors associated with eating-out rate and BMI (2013–2016).

| Variables                          | Men                      |             | Women                      |             |
|------------------------------------|--------------------------|-------------|----------------------------|-------------|
|                                    | Obesity | Overweight | Underweight | Obesity | Overweight | Underweight |
| Daily eating-out rate              | OR     | 95% CI     | OR          | 95% CI | OR          | 95% CI     |
| None                               | 1.00   | -          | -           | -       | 1.00        | -          |
| 1%–50%                             | 1.09 (0.85) | (1.38) | 0.98 (0.76) | (1.26) | 0.53 (0.34) | (0.82) | 1.28 (1.09) | (1.51) | 1.36 (1.14) | (1.64) | 0.81 (0.54) | (1.20) |
| 51%–100%                           | 1.25 (0.95) | (1.64) | 1.10 (0.82) | (1.46) | 0.71 (0.41) | (1.22) | 1.51 (1.24) | (1.84) | 1.50 (1.20) | (1.87) | 0.77 (0.50) | (1.20) |
| Age                                | OR     | 95% CI     | OR          | 95% CI | OR          | 95% CI     |
| 20–29                              | 1.00   | -          | -           | -       | 1.00        | -          |
| 30–39                              | 1.85 (1.41) | (2.43) | 1.46 (1.06) | (2.01) | 0.77 (0.38) | (1.55) | 1.28 (0.99) | (1.67) | 1.04 (0.78) | (1.39) | 0.78 (0.57) | (1.08) |
| 40–49                              | 1.59 (1.19) | (2.12) | 1.44 (1.03) | (2.01) | 0.58 (0.27) | (1.26) | 1.68 (1.28) | (2.20) | 1.48 (1.10) | (1.98) | 0.53 (0.36) | (0.77) |
| 50–59                              | 1.58 (1.17) | (2.13) | 1.61 (1.14) | (2.28) | 0.85 (0.39) | (1.83) | 1.96 (1.49) | (2.60) | 1.70 (1.26) | (2.30) | 0.29 (0.18) | (0.46) |
| 60–69                              | 1.12 (0.82) | (1.53) | 1.26 (0.88) | (1.79) | 0.60 (0.27) | (1.37) | 2.10 (1.56) | (2.82) | 1.98 (1.44) | (2.72) | 0.23 (0.13) | (0.41) |
| ≥70                                | 0.76 (0.54) | (1.06) | 1.03 (0.71) | (1.50) | 0.93 (0.41) | (2.13) | 1.64 (1.20) | (2.26) | 1.63 (1.15) | (2.29) | 0.44 (0.24) | (0.79) |
| Marital status                     | OR     | 95% CI     | OR          | 95% CI | OR          | 95% CI     |
| Unmarried                          | 1.00   | -          | -           | -       | 1.00        | -          |
| Married                            | 1.20 (0.95) | (1.51) | 1.35 (1.03) | (1.76) | 0.81 (0.44) | (1.50) | 1.27 (1.00) | (1.62) | 1.52 (1.17) | (1.99) | 0.57 (0.42) | (0.78) |
| Once married (divorced, separated, bereavement) | 1.21 (0.89) | (1.66) | 1.39 (0.98) | (1.98) | 1.07 (0.51) | (2.26) | 1.17 (0.89) | (1.53) | 1.40 (1.04) | (1.90) | 0.72 (0.46) | (1.13) |
| Household income                   | OR     | 95% CI     | OR          | 95% CI | OR          | 95% CI     |
| Low                                | 1.00   | -          | -           | -       | 1.00        | -          |
| Medium-Low                         | 1.03 (0.86) | (1.23) | 1.02 (0.84) | (1.25) | 1.02 (0.68) | (1.54) | 1.02 (0.88) | (1.18) | 0.98 (0.83) | (1.15) | 1.07 (0.77) | (1.51) |
| Medium-High                        | 1.11 (0.92) | (1.35) | 1.12 (0.91) | (1.38) | 1.06 (0.67) | (1.66) | 0.90 (0.77) | (1.05) | 0.90 (0.75) | (1.06) | 0.88 (0.62) | (1.25) |
| High                               | 1.05 (0.86) | (1.29) | 1.22 (0.99) | (1.52) | 0.67 (0.39) | (1.14) | 0.70 (0.59) | (0.82) | 0.87 (0.73) | (1.04) | 1.18 (0.83) | (1.67) |
| Educational level                  | OR     | 95% CI     | OR          | 95% CI | OR          | 95% CI     |
| Elementary school                  | 1.00   | -          | -           | -       | 1.00        | -          |
| Middle school                      | 0.90 (0.73) | (1.10) | 0.94 (0.75) | (1.17) | 1.28 (0.77) | (2.14) | 0.68 (0.57) | (0.81) | 0.79 (0.65) | (0.96) | 0.76 (0.44) | (1.34) |
| High school                        | 0.95 (0.77) | (1.18) | 0.99 (0.79) | (1.25) | 1.23 (0.71) | (2.14) | 0.48 (0.41) | (0.57) | 0.67 (0.56) | (0.80) | 0.98 (0.62) | (1.56) |
| College or more                    | 0.96 (0.83) | (1.10) | 0.90 (0.77) | (1.06) | 0.90 (0.60) | (1.36) | 0.32 (0.26) | (0.38) | 0.50 (0.40) | (0.61) | 1.10 (0.68) | (1.77) |
### Table 2. Cont.

#### Body Mass Index

| Variables                  | Men |          |          |          |          |          | Women |          |          |          |          |
|----------------------------|-----|----------|----------|----------|----------|----------|-------|----------|----------|----------|----------|
|                            | Obesity | Overweight | Underweight | Obesity | Overweight | Underweight | Obesity | Overweight | Underweight | Obesity | Underweight |
| Occupation                 |          |          |          |          |          |          |       |          |          |          |          |
| Workers                    | 1.06 (0.92) | 1.00 (0.86) | (1.18) 0.66 (0.47) | 0.96 (0.87) | (1.06) 1.02 (0.92) | (1.14) 0.90 (0.74) |          | (1.09) |
| Non-workers                | 1.00   | 1.00     | 1.00     | 0.66     | 1.00     | 1.00     | 1.00   | 1.00     | 1.00     | 1.00     |
| Smoking                    |          |          |          |          |          |          |       |          |          |          |          |
| Yes                        | 1.00   | 1.00     | 1.00     | 1.00     | 1.00     | 1.00     |       | 1.00     | 1.00     | 1.00     |
| No                         | 1.22 (1.07) | (1.38) | (1.12) | (1.48) | (0.74) | (1.02) 0.89 | (0.69) | (1.16) | (1.11) | (0.82) | (1.52) |
| Alcohol consumption        |          |          |          |          |          |          |       |          |          |          |          |
| Yes                        | 1.05 (0.93) | (1.19) | (1.10) | (0.96) | (1.27) | (0.84) | (0.62) | (1.15) | 0.99 (0.89) | (1.09) | (0.84) |
| No                         | 1.00   | 1.00     | 1.00     | 1.00     | 1.00     | 1.00     |       | 1.00     | 1.00     |
| Daily energy intake        |          |          |          |          |          |          |       |          |          |          |          |
| Less than recommended energy intake per day | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Recommended energy intake per day | 0.94 | (0.81) | (1.10) | 1.02 | (0.86) | (1.21) | 0.92 | (0.62) | (1.36) | 0.93 | (0.82) |
| More than recommended energy intake per day | 1.06 | (0.93) | (1.20) | 1.04 | (0.91) | (1.20) | 0.72 | (0.51) | (1.03) | 1.05 | (0.94) |
| Physical activity          |          |          |          |          |          |          |       |          |          |          |          |
| Yes                        | 1.01 (0.90) | (1.13) | (1.04) | (0.92) | (1.18) | 0.67 | (0.49) | (0.91) | 0.96 | (0.88) | (1.06) |
| No                         | 1.00   | 1.00     | 1.00     | 1.00     | 1.00     | 1.00     |       | 1.00     | 1.00     |
| Diabetes mellitus          |          |          |          |          |          |          |       |          |          |          |          |
| No                         | 1.00   | 1.00     | 1.00     | 1.00     | 1.00     | 1.00     |       | 1.00     | 1.00     |
| Yes                        | 1.53 (1.27) | (1.84) | (1.20) | (0.98) | (1.48) | 0.44 | (0.24) | (0.81) | 1.65 | (1.39) | (1.96) |


Table 3. Factors associated with BMI according to the daily eating-out rate.

| Variable                        | None | 1%–50% | 51%–100% | None | 1%–50% | 51%–100% | None | 1%–50% | 51%–100% | None | 1%–50% | 51%–100% |
|---------------------------------|------|--------|----------|------|--------|----------|------|--------|----------|------|--------|----------|
|                                 | OR   | 95% CI | OR       | 95% CI | OR    | 95% CI   | OR   | 95% CI | OR       | OR   | 95% CI | OR       |
| **Men**                         |      |        |          |      |        |          |      |        |          |      |        |          |
| Marital status                  |      |        |          |      |        |          |      |        |          |      |        |          |
| Unmarried                       | 1    | 0.29 (0.09) - | 0.32 (0.10) - | 1    | 0.53 (0.14) - | 0.61 (0.16) - | 1    | 0.09 (0.02) - | 0.11 (0.02) - | 1    | 0.09 (0.02) - | 0.11 (0.02) - |
| Married                         | 1    | 1.16 (0.89) - | 1.44 (1.06) - | 1    | 1.05 (0.80) - | 1.39 (0.85) - | 1    | 0.62 (0.37) - | 0.89 (0.44) - | 1    | 0.62 (0.37) - | 0.89 (0.44) - |
| Once married (divorced, separated, bereavement) | 1    | 1.24 (0.96) - | 1.61 (1.21) - | 1    | 1.31 (0.97) - | 1.75 (1.08) - | 1    | 0.66 (0.36) - | 0.89 (0.15) - | 1    | 0.66 (0.36) - | 0.89 (0.15) - |
| Household income                |      |        |          |      |        |          |      |        |          |      |        |          |
| Low                             | 1    | 1.08 (0.77) - | 1.18 (0.70) - | 1    | 0.86 (0.60) - | 1.21 (0.42) - | 1    | 0.74 (0.41) - | 0.92 (0.41) - | 1    | 0.74 (0.41) - | 0.92 (0.41) - |
| Medium-Low                      | 1    | 1.17 (0.70) - | 1.24 (0.74) - | 1    | 1.07 (0.70) - | 1.36 (0.87) - | 1    | 0.23 (0.10) - | 0.48 (0.18) - | 1    | 0.23 (0.10) - | 0.48 (0.18) - |
| Medium-High                     | 1    | 1.17 (0.60) - | 1.42 (0.70) - | 1    | 0.91 (0.46) - | 1.81 (0.55) - | 1    | 0.43 (0.11) - | 0.64 (0.15) - | 1    | 0.43 (0.11) - | 0.64 (0.15) - |
| High                            | 1    | 0.9 (0.36) - | 1.01 (0.39) - | 1    | 1.08 (0.28) - | 2.14 (0.35) - | 1    | 0.98 (0.01) - | 1.09 (0.47) - | 1    | 0.98 (0.01) - | 1.09 (0.47) - |
| Educational level               |      |        |          |      |        |          |      |        |          |      |        |          |
| Elementary school               | 1    | 1.12 (0.80) - | 1.59 (0.52) - | 1    | 1.06 (0.74) - | 1.50 (0.58) - | 1    | 0.82 (0.46) - | 0.92 (0.10) - | 1    | 0.82 (0.46) - | 0.92 (0.10) - |
| Middle school                   | 1    | 1.04 (0.58) - | 1.85 (0.46) - | 1    | 0.9 (0.49) - | 1.63 (0.39) - | 1    | 0.41 (0.14) - | 0.51 (0.12) - | 1    | 0.41 (0.14) - | 0.51 (0.12) - |
| High school                     | 1    | 1.27 (0.75) - | 2.15 (0.45) - | 1    | 0.98 (0.56) - | 1.70 (0.61) - | 1    | 0.29 (0.11) - | 0.79 (0.11) - | 1    | 0.29 (0.11) - | 0.79 (0.11) - |
| College or more                 | 1    | 0.81 (0.35) - | 1.88 (0.44) - | 1    | 0.71 (0.30) - | 1.69 (0.35) - | 1    | 0.29 (0.06) - | 0.49 (0.15) - | 1    | 0.29 (0.06) - | 0.49 (0.15) - |
| Occupation                      |      |        |          |      |        |          |      |        |          |      |        |          |
| Workers                         | 1    | 1.1 (0.77) - | 1.58 (0.88) - | 1    | 1.09 (0.74) - | 1.60 (0.77) - | 1    | 0.4 (0.19) - | 0.84 (0.42) - | 1    | 0.4 (0.19) - | 0.84 (0.42) - |
| Non-workers                     | 1    | 1.07 (0.77) - | 1.48 (0.76) - | 1    | 0.86 (0.62) - | 1.20 (0.75) - | 1    | 0.62 (0.36) - | 1.07 (0.42) - | 1    | 0.62 (0.36) - | 1.07 (0.42) - |
| **Women**                       |      |        |          |      |        |          |      |        |          |      |        |          |
| Marital status                  |      |        |          |      |        |          |      |        |          |      |        |          |
| Unmarried                       | 1    | 1.09 (0.38) - | 3.13 (0.41) - | 1    | 2.37 (0.42) - | 13.23 (0.52) - | 1    | 2.23 (0.36) - | 14.00 (0.30) - | 1    | 2.23 (0.36) - | 14.00 (0.30) - |
| Married                         | 1    | 1.3 (1.05) - | 1.62 (1.21) - | 1    | 1.37 (1.08) - | 1.74 (1.13) - | 1    | 0.86 (0.47) - | 1.56 (0.48) - | 1    | 0.86 (0.47) - | 1.56 (0.48) - |
| Once married (divorced, separated, bereavement) | 1    | 1.24 (0.96) - | 1.61 (1.21) - | 1    | 1.31 (0.97) - | 1.75 (1.08) - | 1    | 0.66 (0.36) - | 1.22 (0.15) - | 1    | 0.66 (0.36) - | 1.22 (0.15) - |
Table 3. Cont.

| Variable         | Obesity            |          | Overweight         |          | Underweight         |          |
|------------------|--------------------|----------|--------------------|----------|--------------------|----------|
|                  | None               | 1%–50%  | 51%–100%           | None     | 1%–50%             | 51%–100% |
|                  | **OR**             | 95% CI   | **OR**             | 95% CI   | **OR**             | 95% CI   |
| Household income | Low                 | 1.34     | (1.06)             | 1.49     | (1.01)             | 1.34     | (1.03) |
|                  |                    | (1.34)   | (1.06)             | (1.49)   | (1.01)             | (1.34)   | (1.03) |
|                  | Medium-Low         | 1.13     | (0.83)             | 1.43     | (0.99)             | 1.5      | (1.05) |
|                  |                    | (1.13)   | (0.83)             | (1.43)   | (0.99)             | (1.5)    | (1.05) |
|                  | Medium-High        | 1.3      | (0.85)             | 1.41     | (0.89)             | 1.37     | (0.84) |
|                  |                    | (1.3)    | (0.85)             | (1.41)   | (0.89)             | (1.37)   | (0.84) |
|                  | High               | 1.24     | (0.66)             | 1.42     | (0.75)             | 1.08     | (0.57) |
|                  |                    | (1.24)   | (0.66)             | (1.42)   | (0.75)             | (1.08)   | (0.57) |
| Educational level| Elementary school  | 1.27     | (1.04)             | 1.4      | (0.96)             | 1.3      | (1.04) |
|                  |                    | (1.27)   | (1.04)             | (1.4)    | (0.96)             | (1.3)    | (1.04) |
|                  | Middle school      | 1.35     | (0.86)             | 1.61     | (0.92)             | 1.62     | (0.97) |
|                  |                    | (1.35)   | (0.86)             | (1.61)   | (0.92)             | (1.62)   | (0.97) |
|                  | High school        | 0.95     | (0.61)             | 1.07     | (0.67)             | 1.53     | (0.88) |
|                  |                    | (0.95)   | (0.61)             | (1.07)   | (0.67)             | (1.53)   | (0.88) |
|                  | College or more    | 1.06     | (0.48)             | 1.28     | (0.57)             | 1.13     | (0.47) |
|                  |                    | (1.06)   | (0.48)             | (1.28)   | (0.57)             | (1.13)   | (0.47) |
| Occupation       | Workers            | 1.38     | (1.05)             | 1.44     | (1.06)             | 1.19     | (0.88) |
|                  |                    | (1.38)   | (1.05)             | (1.44)   | (1.06)             | (1.19)   | (0.88) |
|                  | Non-workers        | 1.24     | (1.01)             | 1.67     | (1.28)             | 1.48     | (1.17) |
|                  |                    | (1.24)   | (1.01)             | (1.67)   | (1.28)             | (1.48)   | (1.17) |
4. Discussion

Previous studies conducted in other countries identified a positive association between the frequency of eating-out with BMI [23–30]. Specifically, previous studies conducted in Europe suggested that foods consumed while eating-out tend to contain higher amounts of energy-dense macronutrients, such as fat and sugar, compared to those prepared at home [24], while a Brazilian study found a positive correlation between the frequency of food intake with adult weight gain in South America [23]. Our finding of a significant association between the eating-out rate and BMI among Korean adult women but not men was partially consistent with those previous reports. Our observations indicate that a high frequency of eating-out may correlate with a higher BMI among women. Particularly, we found that many married women who eat out frequently are overweight or obese. Furthermore, it was confirmed that women with frequent eating-out patterns were more likely to be obese, regardless of their occupational status. In addition, as in the previous study, the analysis of our study showed that a person with diabetes is likely to have a high BMI [22].

Our findings suggest a need for improvements in education, publicity, and policies regarding healthy eating habits, and indicate that institutional measures should be formulated to establish a healthy culture of eating-out. Approximately 92.8% of Korean men and 89% of Korean women have reported exposure to eating-out [31]. As the proportion of people who eat out has been on the rise lately, the government needs to review the various laws and regulations related to eating-out and lead a proper eating-out culture [32]. Such as, by providing eating-out guidelines for diabetics, providing calorie information for each food, and guidelines for using ingredients for restaurants. But before we do that, the relationship between the eating-out rate and obesity in women requires verification. According to a previous study conducted in the United States, the analysis of eating-out and BMI of premenopausal women showed higher BMIs in women who frequently eat out [28]. As with this prior study, according to our results, the more often Korean women eat out, the more they are affected in terms of their BMI. However, no significant results were found in men, only identifying the tendency that BMI may increase as more people eat out. This is in contrast to previous studies that suggested that BMI may increase with the rate of eating-out for both men and women [23,33,34]. To validate our findings, further investigations are recommended to see if there is a causal relationship between BMI and eating-out. Based on our research, causality in further studies will help to come up with measures to reduce obesity in certain populations.

Our research has numerous limitations. First, we used cross-sectional data, thus could not include accurate information about the food consumed during meals. To objectively determine the relationship between the eating-out rate and BMI, it would be necessary to compare calories from identical menus of foods prepared at home and in a restaurant. Second, data concerning the daily eating-out rate were derived from a combination of four indicators and was calculated as the ratio of numeric responses to the questions, “How often did you eat out on average during the past year?” and “How many times a week did you have breakfast (lunch, dinner) in the last year?” and multiplied by 100 to yield a percentage. Therefore, the measurement values may have been more unstable than values derived using a single index. Third, the relevant KNHANES question inquired about the average during the previous 1-year period. The response relies on the potentially incomplete and inaccurate memory of the respondent, thus may be subject to recall bias. Fourth, it is difficult to define obesity and overweightness according to the BMI standard, or to assume exposure to other diseases. For example, BMI measurements often suggest that people with an above-average muscle mass are overweight or obese.

Despite these limitation, our research has several strengths of note. First, the use of nationally representative data will allow our results to be generalized to the general adult population of South Korea. Second, as the statistical analysis was based on data collected over four consecutive years, the correlation between the rate of eating-out and BMI among Korean adults is relatively reliable. Third, our findings are consistent with previous studies suggesting that eating-out, compared to eating
at home, may be associated with a higher caloric intake [23–26,35] and is more likely to increase BMI [36,37].

5. Conclusions

Our study found that the higher the rate of eating-out among Korean women, the higher their BMI. However, there were no similar associations observed among men. Our research will help the Korean Government and organizations to review and improve their regulations and implement them, to create a healthy and correct eating-out culture for the people.

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References
1. World Health Organization. Obesity and Overweight; WHO: Geneva, Switzerland, 2018.
2. Sacks, G.; Swinburn, B.; Lawrence, M. Obesity policy action framework and analysis grids for a comprehensive policy approach to reducing obesity. Obes. Rev. 2009, 10, 76–86. [CrossRef] [PubMed]
3. Deckelbaum, R.J.; Williams, C.L. Childhood obesity: The health issue. Obes. Res. 2001, 9, 239S–243S. [CrossRef] [PubMed]
4. Hedley, A.A.; Ogden, C.L.; Johnson, C.L.; Carroll, M.D.; Curtin, L.R.; Flegal, K.M. Prevalence of overweight and obesity among US children, adolescents, and adults, 1999-2002. JAMA 2004, 291, 2847–2850. [CrossRef] [PubMed]
5. World Health Organization Global Action against Cancer. Available online: https://www.who.int/cancer/media/GlobalActionCancerEngFull.pdf (accessed on 22 May 2018).
6. Korea National Health Insurance Service. Obesity White Paper, 2017.
7. Van, G.L.F.; Mertens, I.L.; Christophe, E. Mechanisms linking obesity with cardiovascular disease. Nature 2006, 444, 875.
8. Grundy, S.M. Obesity, metabolic syndrome, and cardiovascular disease. J. Clin. Endocrinol. Metab. 2004, 89, 2595–2600. [CrossRef] [PubMed]
9. DeFronzo, R.A.; Ferrannini, E. Insulin resistance: A multifaceted syndrome responsible for NIDDM, obesity, hypertension, dyslipidemia, and atherosclerotic cardiovascular disease. Diabetes Care 1991, 14, 173–194. [CrossRef] [PubMed]
10. Wearing, S.C.; Hennig, E.M.; Byrne, N.M. Musculoskeletal disorders associated with obesity: A biomechanical perspective. Obes. Rev. 2006, 7, 239–250. [CrossRef] [PubMed]
11. Calle, E.E.; Kaaks, R. Overweight, obesity and cancer: Epidemiological evidence and proposed mechanisms. Nat. Rev. Cancer 2004, 4, 579. [CrossRef] [PubMed]
12. Kumanyika, S.; Jeffery, R.W.; Morabia, A.; Ritenbaugh, C.; Antipatis, V.J. Obesity prevention: The case for action. Int. J. Obes. 2002, 26, 425. [CrossRef] [PubMed]
13. Hesketh, K.; Waters, E.; Green, J.; Salmon, L.; Williams, J. Healthy eating, activity and obesity prevention: A qualitative study of parent and child perceptions in Australia. Health Promot. Int. 2005, 20, 19–26. [CrossRef] [PubMed]
14. Müller, M.J.; Asbeck, I.; Mast, M.; Langnäse, K.; Grund, A. Prevention of obesity—more than an intention. Concept and first results of the Kiel Obesity Prevention Study (KOPS). Int. J. Obes. 2001, 25, S66. [CrossRef] [PubMed]
15. Park, S.H.; Lee, K.S. Changes in the occupational structure and the spatial characteristics of employment distribution in Korea. J. Korean Geogr. Soc. 2016, 51, 401–420.
16. Statistics Korea. Korea National Health Statistics; Statistics Korea: Daejeon, Korea, 2017.
17. Korea Centers for Disease Control and Prevention 2016. National Health Statistics. Available online: http://www.cdc.go.kr/cdc/ (accessed on 23 May 2018).
18. Kim, S.Y. An impact of changes in Korean adults’ dietary life on obesity: Focusing on expansion in eating away from home. Korean J. Agric. Manag. Policy 2015, 42, 862–887.
19. Welfare, K.M.O.H.A. Korean Nutrition Standard. Available online: http://kns.or.kr/FileRoom/FileRoom.asp?BoardID=Kdr (accessed on 23 May 2018).
20. Donnelly, J.E.; Blair, S.N.; Jakicic, J.M.; Manore, M.M.; Rankin, J.W.; Smith, B.K. Appropriate physical activity intervention strategies for weight loss and prevention of weight regain for adults. Med. Sci. Sports Exerc. 2009, 41, 459–471. [CrossRef] [PubMed]
21. Dunstan, D.W.; Zimmet, P.Z.; Welborn, T.A. The rising prevalence of diabetes and impaired glucose tolerance: The Australian diabetes, obesity and lifestyle study. Diabetes Care 2002, 25, 829–834. [CrossRef] [PubMed]
22. Mokdad, A.H.; Ford, E.S.; Bowman, B.A. Prevalence of obesity, diabetes, and obesity-related health risk factors. JAMA 2003, 289, 76–79. [CrossRef]
23. Bezerra, I.N.; Sichieri, R. Eating out of home and obesity: A Brazilian nationwide survey. Public Health Nutr. 2009, 12, 2037–2043. [CrossRef]
24. Naska, A.; Katsoulis, M.; Orfanos, P.; Lachat, C.; Gedrich, K.; Rodrigues, S.S.P.; Freisling, H.; Kolsteren, P.; Engeset, D.; Lopes, C. Eating out is different from eating at home among individuals who occasionally eat out. A cross-sectional study among middle-aged adults from eleven European countries. Br. J. Nutr. 2015, 113, 1951–1964. [CrossRef]
25. Bowman, S.A.; Vinyard, B.T. Fast food consumption of US adults: Impact on energy and nutrient intakes and overweight status. J. Am. Coll. Nutr. 2004, 23, 163–168. [CrossRef]
26. Nicklas, T.A.; Baranowski, T.; Cullen, K.W.; Berenson, G. Eating patterns, dietary quality and obesity. J. Am. Coll. Nutr. 2001, 20, 599–608. [CrossRef]
27. Lachat, C.; Nago, E.; Verstraeten, R.; Roberfroid, D.; Van, C.J.; Kolsteren, P. Eating out of home and its association with dietary intake: A systematic review of the evidence. Obes. Rev. 2012, 13, 329–346. [CrossRef] [PubMed]
28. Clemens, L.H.E.; Slawson, D.L.; Klesges, R.C. The effect of eating out on quality of diet in premenopausal women. J. Am. Diet. Assoc. 1999, 99, 442–444. [CrossRef]
29. Bhutani, S.; Schoeller, D.A.; Walsh, M.C.; McWilliams, C. Frequency of eating out at both fast-food and sit-down restaurants was associated with high body mass index in non-large metropolitan communities in midwest. Am. J. Health Promot. 2018, 32, 75–83. [CrossRef] [PubMed]
30. Lachat, C.; Khanh, L.N.B.; Khan, N.C.; Dung, N.Q.; Van, A.N.D.; Roberfroid, D.; Kolsteren, P. Eating out of home in Vietnamese adolescents: Socioeconomic factors and dietary associations. Am. J. Clin. Nutr. 2009, 90, 1648–1655. [CrossRef] [PubMed]
31. Koo, S.; Park, K. Dietary behaviors and lifestyle characteristics related to frequent eating out among Korean adults. J. Korean Soc. Food Sci. Nutr. 2013, 42, 705–712. [CrossRef]
32. Vandevijvere, S.; Lachat, C.; Kolsteren, P.; Van, O.H. Eating out of home in Belgium: Current situation and policy implications. Br. J. Nutr. 2009, 102, 921–928. [CrossRef] [PubMed]
33. Bezerra, I.N.; Curioni, C.; Sichieri, R. Association between eating out of home and body weight. Nutr. Rev. 2012, 70, 65–79. [CrossRef]
34. Naska, A.; Orfanos, P.; Trichopoulou, A. Eating out, weight and weight gain. A cross-sectional and prospective analysis in the context of the EPIC-PANACEA study. Int. J. Obes. 2011, 35, 416. [CrossRef]
35. Burns, C.; Jackson, M.; Gibbons, C.; Stoney, R.M. Foods prepared outside the home: Association with selected nutrients and body mass index in adult Australians. Public Health Nutr. 2002, 5, 441–448. [CrossRef]
36. Chung, S.J.; Kang, S.H.; Song, S.M.; Ryu, S.H.; Yoon, J.H. Nutritional quality of Korean adults’ consumption of lunch prepared at home, commercial places, and institutions: Analysis of the data from the 2001 National Health and Nutrition Survey. Korean J. Nutr. 2006, 39, 841–849.
37. Jiang, L.; Lee, Y.K. Analysis of sodium content of representative Korean foods high in sodium from home meal, foodservice, and restaurants. J. Nutr. Health 2017, 50, 655–663. [CrossRef]