|  |
| --- |
| **Supplementary 1. Prevalence ratios (PRs)\* and 95% confidence intervals (CIs) of non-alcoholic fatty liver (NAFLD) with ALT > 20 U/L by intake of energy-adjusted sodium, potassium, and sodium to potassium**  |
|  | **Quintiles of intake**  | ***P* for trend** |
| **Q1** | **Q2** | **Q3** | **Q4** | **Q5** |
| **Men** |  |  |  |  |  |  |
| **Sodium†** |  |  |  |  |  |  |
| Median, mg/d | 1219  | 1697  | 2126  | 2641  | 3485  |  |
| No. of cases |  2,510 | 2,597 | 2,598 | 2,682 | 2,708 |  |
| Age and energy-adjusted | 1.00 (reference) | 1.04 (0.99–1.09) | 1.04 (0.99–1.10) | 1.08 (1.03–1.14) | 1.11 (1.05–1.18) | <0.001 |
| Multivariable-adjusted | 1.00 (reference) | 1.07 (1.02–1.12) | 1.11 (1.05–1.17) | 1.19 (1.12–1.26) | 1.27 (1.18–1.35) | <0.001 |
| **Potassium‡** |  |  |  |  |  |  |
| Median, mg/d | 1384  | 1718  | 1977  | 2270  | 2774  |  |
| No. of cases | 2,562 | 2,592 | 2,687 | 2,661 | 2,593 |  |
| Age and energy-adjusted | 1.00 (reference) | 0.98 (0.94–1.03) | 1.00 (0.95–1.05) | 0.98 (0.92–1.03) | 0.93 (0.88–0.98) | 0.007 |
| Multivariable-adjusted | 1.00 (reference) | 1.02 (0.97–1.07) | 1.07 (1.01–1.14) | 1.09 (1.02–1.16) | 1.08 (1.00–1.17) | 0.05 |
| **Sodium to potassium ratio** |  |  |  |  |  |  |
| Median, ratio | 0.7  | 0.9  | 1.1  | 1.3  | 1.6  |  |
| No. of cases | 2,466 | 2,612 | 2,679 | 2,628 | 2,710 |  |
| Age and energy-adjusted | 1.00 (reference) | 1.06 (1.01–1.11) | 1.09 (1.04–1.14) | 1.07 (1.02–1.12) | 1.11 (1.06–1.16) | <0.001 |
| Multivariable-adjusted | 1.00 (reference) | 1.06 (1.01–1.11) | 1.10 (1.05–1.15) | 1.09 (1.04–1.15) | 1.16 (1.10–1.21) | <0.001 |
|  |  |  |  |  |  |  |
| **Women** |  |  |  |  |  |  |
| **Sodium†** |  |  |  |  |  |  |
| Median, mg/d | 1077  | 1502  | 1902  | 2397  | 3310  |  |
| No. of cases | 334 | 379 | 402 | 449 | 504  |  |
| Age and energy-adjusted | 1.00 (reference) | 1.14 (0.98–1.32) | 1.17 (1.00–1.36) | 1.24 (1.06–1.44) | 1.34 (1.14–1.58) | <0.001 |
| Multivariable-adjusted | 1.00 (reference) | 1.16 (1.00–1.35) | 1.21 (1.03–1.41) | 1.28 (1.09–1.52) | 1.39 (1.16–1.67) | 0.001 |
| **Potassium‡** |  |  |  |  |  |  |
| Median, mg/d | 1347  | 1686  | 1968  | 2296  | 2896  |  |
| No. of cases | 361 | 395 | 414 | 434 | 464 |  |
| Age and energy-adjusted | 1.00 (reference) | 1.00 (0.86–1.15) | 0.97 (0.83–1.13) | 0.93 (0.79–1.08) | 0.86 (0.73–1.01) | 0.03 |
| Multivariable-adjusted | 1.00 (reference) | 1.10 (0.94–1.29) | 1.15 (0.96–1.38) | 1.18 (0.97–1.44) | 1.19 (0.93–1.51) | 0.24 |
| **Sodium to potassium ratio** |  |  |  |  |  |  |
| Median, ratio | 0.6  | 0.8  | 1.0  | 1.2  | 1.5  |  |
| No. of cases | 382 | 355 | 425 | 426 | 480  |  |
| Age and energy-adjusted | 1.00 (reference) | 0.95 (0.82–1.09) | 1.11 (0.97–1.27) | 1.10 (0.97–1.26) | 1.19 (1.05–1.36) | 0.001 |
| Multivariable-adjusted | 1.00 (reference) | 0.93 (0.80–1.07) | 1.07 (0.94–1.23) | 1.06 (0.93–1.21) | 1.12 (0.97–1.28) | 0.03 |
| Note: The overall interactions between sex and sodium and potassium intake in relation to the prevalence of NAFLD was <0.05 for in age-, energy-adjusted and multivariate-adjusted model. |
| \* Estimated from a Poisson regression model with a robust error variance using a binary outcome variable (presence or absence).Multivariable-adjusted model was adjusted for age, total energy intake (quintiles), study center (two categories), year of screening exam (one-year categories), education level (<community college, ≥community college graduate, or unknown), physical activity level (inactive, minimally active, HEPA, or unknown), smoking (never, past, current, or unknown), alcohol intake (0, < 10, or ≥ 10 g/d), and intake of energy-adjusted calcium, protein, and fiber (quintiles). |
| † Additionally adjusted for quintiles of energy-adjusted potassium intake. |  |  |  |  |
| ‡ Additionally adjusted for quintiles of energy-adjusted sodium intake. |  |  |  |  |

|  |  |
| --- | --- |
| **Supplementary Table 2. Multivariable-adjusted PRs\* and 95% CIs of NAFLD using the fatty liver index (FLI)† by intake of energy-adjusted sodium and potassium and sodium to potassium ratio** | 　 |
|  | **Quintiles of intake**  | ***P* for** **trend** |
| **Q1** | **Q2** | **Q3** | **Q4** | **Q5** |
| **Men** |  |  |  |  |  |  |
| **Sodium‡** |  |  |  |  |  |  |
| PR (95% CI) for FLI 30–< 60 | 1.00 (reference) | 1.09 (1.00–1.18) | 1.09 (1.00–1.19) | 1.17 (1.06–1.29) | 1.29 (1.16–1.43) | <0.001 |
| PR (95% CI) for ≥ 60 | 1.00 (reference) | 1.17 (1.05–1.31) | 1.23 (1.08–1.38) | 1.33 (1.16–1.51) | 1.64 (1.42–1.90) | <0.001 |
| **Potassium§** |  |  |  |  |  |  |
| PR (95% CI) for FLI 30–< 60 | 1.00 (reference) | 1.03 (0.94–1.12) | 1.09 (0.98–1.20) | 1.07 (0.96–1.19) | 1.06 (0.93–1.21) | 0.44 |
| PR (95% CI) for ≥ 60 | 1.00 (reference) | 1.03 (0.91–1.16) | 1.13 (0.99–1.29) | 1.12 (0.96–1.30) | 1.08 (0.91–1.29) | 0.43 |
| **Sodium to potassium ratio** |  |  |  |  |  |  |
| PR (95% CI) for FLI 30–< 60 | 1.00 (reference) | 1.00 (0.93–1.08) | 1.08 (1.00–1.17) | 1.12 (1.03–1.20) | 1.09 (1.01–1.19) | 0.004 |
| PR (95% CI) for ≥ 60 | 1.00 (reference) | 1.06 (0.96–1.18) | 1.17 (1.05–1.30) | 1.19 (1.07–1.33) | 1.35 (1.21–1.51) | <0.001 |
|  |  |  |  |  |  |  |
| **Women** |  |  |  |  |  |  |
| **Sodium‡** |  |  |  |  |  |  |
| PR (95% CI) for FLI 30–< 60 | 1.00 (reference) | 1.11 (0.95–1.31) | 1.28 (1.09–1.52) | 1.36 (1.14–1.62) | 1.57 (1.29–1.90) | <0.001 |
| PR (95% CI) for ≥ 60 | 1.00 (reference) | 1.05 (0.78–1.41) | 1.28 (0.94–1.73) | 1.43 (1.04–1.96) | 1.75 (1.23–2.50) | 0.001 |
| **Potassium§**  |  |  |  |  |  |  |
| PR (95% CI) for FLI 30–< 60 | 1.00 (reference) | 1.08 (0.92–1.27) | 0.91 (0.75–1.10) | 1.05 (0.85–1.30) | 1.03 (0.80–1.32) | 0.85 |
| PR (95% CI) for ≥ 60 | 1.00 (reference) | 1.06 (0.78–1.44) | 1.07 (0.75–1.52) | 1.17 (0.79–1.74) | 1.50 (0.96–2.36) | 0.05 |
| **Sodium to potassium ratio** |  |  |  |  |  |  |
| PR (95% CI) for FLI 30–< 60 | 1.00 (reference) | 0.95 (0.82–1.10) | 1.09 (0.95–1.26) | 1.11 (0.96–1.28) | 1.24 (1.07–1.43) | <0.001 |
| PR (95% CI) for ≥ 60 | 1.00 (reference) | 1.01 (0.76–1.34) | 1.15 (0.87–1.51) | 1.39 (1.06–1.82) | 1.39 (1.06–1.83) | 0.003  |
| Note : A total of 81,395 participants (men 37,541; women 43,854) out of all study participants (81.3%) were available for the analysis of FLI. |
| \* Estimated from a multinomial logistic regression models using 3 categories (FLI score 30–< 60 and ≥ 60 compared to FLI <30). Multivariable-adjusted model was adjusted for age, total energy intake (quintiles), study center (two categories), year of screening exam (one-year categories), education level (<community college, ≥community college graduate, or unknown), alcohol intake (0, < 10, or ≥ 10g/d), physical activity level (inactive, minimally active, HEPA, or unknown), smoking (never, past, current, or unknown), and intake of energy-adjusted calcium, protein, fiber (quintiles). |
| † Fatty liver index was calculated according to the published formula: FLI = (e 0.953\*loge (triglycerides) + 0.139\*BMI + 0.718\*loge (ggt) +0.053\*waist circumference - 15.745) / (1 + e 0.953\*loge (triglycerides) +0.139\*BMI + 0.718\*loge (ggt) + 0.053\*waist circumference - 15.745) \* 100  |
| ‡ Additionally adjusted for quintiles of energy-adjusted potassium intake. |  |  |  |  |
| § Additionally adjusted for quintiles of energy-adjusted sodium intake. |  |  |  |  |

|  |
| --- |
| **Supplementary Table 3. Multivariable-adjusted PRs\* and 95% CIs for prevalence of NAFLD by intake of energy-adjusted sodium in selected subgroups from the overall population** |
| 　 | **Quintiles of intake**  | ***P* for trend** | ***P* for interaction** |
| Q1 | Q2 | Q3 | Q4 | Q5 |
| **Sodium**  |  |  |  |  |  |  |  |
| Age |  |  |  |  |  |  |  |
| < 40 years (n=65,167) | 1.00 (reference) | 1.07 (1.02–1.13) | 1.13 (1.07–1.20) | 1.19 (1.12–1.27) | 1.25 (1.17–1.35) | <0.001 | 0.08 |
| ≥ 40 years (n=35,010) | 1.00 (reference) | 1.11 (1.05–1.18) | 1.13 (1.06–1.21) | 1.23 (1.15–1.31) | 1.33 (1.24–1.44) | <0.001 |  |
| Smoking  |  |  |  |  |  |  |  |
| Non-current smoker (n=68,807) | 1.00 (reference) | 1.08 (1.03–1.14) | 1.15 (1.09–1.21) | 1.23 (1.16–1.30) | 1.31 (1.23–1.40) | <0.001 | 0.79 |
| Current smoker (n=16,574) | 1.00 (reference) | 1.10 (1.02–1.19) | 1.11 (1.03–1.21) | 1.20 (1.10–1.31) | 1.21 (1.10–1.34) | <0.001 |  |
| Physical activity |  |  |  |  |  |  |  |
| Inactive (n=42,012)  | 1.00 (reference) | 1.11 (1.05–1.18) | 1.17 (1.10–1.25) | 1.26 (1.17–1.35) | 1.36 (1.26–1.47) | <0.001 | 0.76 |
| Minimally active or more (n=52,899)  | 1.00 (reference) | 1.08 (1.03–1.15) | 1.13 (1.06–1.20) | 1.21 (1.13–1.29) | 1.27 (1.19–1.37) | <0.001 |  |
| BMI |  |  |  |  |  |  |  |
| < 23kg/m2 (n=58,628) | 1.00 (reference) | 1.07 (0.97–1.18) | 1.09 (0.98–1.21) | 1.14 (1.01–1.28) | 1.28 (1.12–1.46) | <0.001 | 0.27 |
| ≥ 23kg/m2 (n=41,435) | 1.00 (reference) | 1.05 (1.01–1.09) | 1.06 (1.02–1.11) | 1.11 (1.06–1.16) | 1.14 (1.08–1.19) | <0.001 |  |
| BF% |  |  |  |  |  |  |  |
| < 23% men, <35% women (n=73,765) | 1.00 (reference) | 1.08 (1.01–1.16) | 1.09 (1.02–1.18) | 1.13 (1.05–1.22) | 1.18 (1.08–1.28) | 0.001 | 0.01 |
| ≥ 23% men, ≥35% women (n=26,225) | 1.00 (reference) | 1.04 (0.99–1.08) | 1.04 (1.00–1.09) | 1.09 (1.04–1.14) | 1.12 (1.07–1.18) | <0.001 | 　 |
| \* Estimated from a Poisson regression model with a robust error variance using a binary outcome variable (presence or absence). Multivariable-adjusted model was adjusted for age, total energy intake (quintiles), study center (two categories), year of screening exam (one-year categories), education level (<community college, ≥community college graduate, or unknown), physical activity level (inactive, minimally active, HEPA, or unknown), smoking (never, past, current, or unknown), alcohol intake (0, < 10, or ≥ 10 g/d), and intake of energy-adjusted calcium, protein, fiber, and potassium (quintiles). |