**Supplementary Material**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table S1 The associations of total and the specific flavonoids with the incidence of MetS and its components | | | | | |
| Flavonoids | | Metabolic Syndrome | | | |
| Model 1 | | Model 2 | Model 3 |
| Total | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.757(0.587,0.976) | | 0.834(0.633,1.098) | 0.814(0.611,1.084) |
|  | Q3 | 0.632(0.484,0.825) | | 0.734(0.551,0.979) | 0.694(0.500,0.963) |
|  | Q4 | 0.604(0.465,0.785) | | 0.657(0.482,0.877) | 0.583(0.365,0.930) |
|  | *P* for trend | <0.001 | | 0.004 | 0.019 |
| Quercetion | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.736(0.569,0.951) | | 0.827(0.626,1.092) | 0.804(0.602,1.074) |
|  | Q3 | 0.698(0.538,0.907) | | 0.763(0.574,1.015) | 0.711(0.513,0.986) |
|  | Q4 | 0.584(0.449,0.760) | | 0.637(0.476,0.853) | 0.547(0.342,0.876) |
|  | *P* for trend | <0.001 | | 0.003 | 0.012 |
| Kaempferol | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.792(0.616,1.020) | | 0.856(0.6511.125) | 0.825(0.619,1.099) |
|  | Q3 | 0.622(0.476,0.814) | | 0.710(0.531,0.948) | 0.655(0.468,0.918) |
|  | Q4 | 0.612(0.471,0.797) | | 0.669(0.502,0.893) | 0.560(0.339,0.926) |
|  | *P* for trend | <0.001 | | 0.005 | 0.015 |
| Isorhamnetin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.760(0.589,0.980) | | 0.837(0.635,1.104) | 0.813(0.607,1.088) |
|  | Q3 | 0.632(0.484,0.824) | | 0.720(0.540,0.961) | 0.674(0.481,0.945) |
|  | Q4 | 0.621(0.478,0.806) | | 0669(0.501,0.893) | 0.579(0.348,0.962) |
|  | *P* for trend | <0.001 | | 0.006 | 0.025 |
| Apigenin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.870(0.675,1.122) | | 0.900(0.684,1.184) | 0.899(0.674,1.198) |
|  | Q3 | 0.730(0.559,0.952) | | 0.768(0.576,1.022) | 0.759(0.542,1.063) |
|  | Q4 | 0.668(0.511,0.873) | | 0.743(0.558,0.990) | 0.729(0.444,1.197) |
|  | *P* for trend | 0.002 | | 0.032 | 0.166 |
| Luteolin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.723(0.559,0.934) | | 0.797(0.604,1.052) | 0.796(0.578,1.024) |
|  | Q3 | 0.687(0.529,0.891) | | 0.739(0.555,0.982) | 0.677(0.491,0.934) |
|  | Q4 | 0.555(0.529,0.722) | | 0.587(0.438,0.788) | 0.491(0.316,0.762) |
|  | *P* for trend | <0.001 | | <0.001 | 0.002 |
| Central Obesity | | | | | |
| Total | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.846(0.642,1.115) | | 0.815(0.597,1.113) | 0.742(0.535,1.030) |
|  | Q3 | 0.922(0.698,1.218) | | 0.956(0.698,1.310) | 0.798(0.553,1.152) |
|  | Q4 | 1.019(0.777,1.337) | | 0.868(0.634,1.187) | 0.562(0.332,0.952) |
|  | *P* for trend | 0.587 | | 0.631 | 0.060 |
| Quercetion | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.919(0.698,1.210) | | 0.958(0.704,1.306) | 0.858(0.621,1.186) |
|  | Q3 | 0.962(0.728,1.272) | | 0.902(0.657,1.239) | 0.733(0.509,1.055) |
|  | Q4 | 1.042(0.795,1.366) | | 0.879(0.642,1.204) | 0.538(0.324,0.894) |
|  | *P* for trend | 0.599 | | 0.400 | 0.014 |
| Kaempferol | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.933(0.708,1.230) | | 0.921(0.675,1.258) | 0.803(0.578,1.114) |
|  | Q3 | 0.949(0.720,1.329) | | 0.966(0.707,1.319) | 0.740(0.512,1.071) |
|  | Q4 | 1.011(0.769,1.329) | | 0.852(0.623,1.166) | 0.452(0.260,0.785) |
|  | *P* for trend | 0.823 | | 0.356 | 0.006 |
| Isorhamnetin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.883(0.669,1.166) | | 0.858(0.628,1.173) | 0.776(0.558,1.078) |
|  | Q3 | 0.970(0.735,1.281) | | 0.979(0.715,1.340) | 0.806(0.556,1.167) |
|  | Q4 | 1.076(0.821,1.411) | | 0.896(0.655,1.226) | 0.561(0.325,0.971) |
|  | *P* for trend | 0.368 | | 0.703 | 0.063 |
| Apigenin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.887(0.672,1.169) | | 0.846(0.621,1.153) | 0.792(0.572,1.097) |
|  | Q3 | 0.935(0.711,1.231) | | 0.911(0.671,1.237) | 0.796(0.555,1.143) |
|  | Q4 | 1.036(0.789,1.360) | | 0.931(0.686,1.265) | 0.691(0.408,1.171) |
|  | *P* for trend | 0.581 | | 0.888 | 0.218 |
| Luteolin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.946(0.719,1.246) | | 0.965(0.708,1.315) | 0.878(0.6371.210) |
|  | Q3 | 0.940(0.713,1.240) | | 0.831(0.606,1.141) | 0.685(0.480,0.978) |
|  | Q4 | 1.012(0.772,1.326) | | 0.846(0.618,1.157) | 0.546(0.343,0.868) |
|  | *P* for trend | 0.858 | | 0.239 | 0.007 |
| High Blood Pressure | | | | | |
| Total | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.631(0.492,0.811) | | 0.734(0.561,0.960) | 0.760(0.574,1.006) |
|  | Q3 | 0.541(0.417,0.701) | | 0.683(0.518,0.901) | 0.741(0.538,1.020) |
|  | Q4 | 0.483(0.373,0.624） | | 0.653(0.495,0.862) | 0.772(0.490,1.215) |
|  | *P* for trend | <0.001 | | 0.005 | 0.262 |
| Quercetion | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.701(0.546,0.900) | | 0.832(0.635,1.090) | 0.854(0.643,1.134) |
|  | Q3 | 0.616(0.477,0.795) | | 0.759(0.577,0.999) | 0.792(0.577,1.088) |
|  | Q4 | 0.466(0.359,0.606) | | 0.638(0.482,0.847) | 0.689(0.436,1.089) |
|  | *P* for trend | <0.001 | | 0.002 | 0.109 |
| Kaempferol | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.616(0.480,0.790) | | 0.716(0.547,0.936) | 0.731(0.551,0.970) |
|  | Q3 | 0.513(0.395,0.667) | | 0.630(0.477,0.833) | 0.661(0.477,0.917) |
|  | Q4 | 0.480(0.371,0.621) | | 0.631(0.479,0.830) | 0.671(0.416,1.082) |
|  | *P* for trend | <0.001 | | 0.002 | 0.083 |
| Isorhamnetin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.622(0.484,0.799) | | 0.730(0.558,0.955) | 0.751(0.565,0.997) |
|  | Q3 | 0.532(0.411,0.689) | | 0.656(0.498,0.866) | 0.697(0.501,0.968) |
|  | Q4 | 0.475(0.376,0.614) | | 0.641(0.486,0.846) | 0.723(0.442,1.182) |
|  | *P* for trend | <0.001 | | 0.003 | 0.172 |
| Apigenin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.711(0.554,0.911) | | 0.734(0.562,0.959) | 0.765(0.578,1.013) |
|  | Q3 | 0.539(0.415,0.702) | | 0.612(0.462,0.809) | 0.681(0.490,0.945) |
|  | Q4 | 0.574(0.444,0.743) | | 0.699(0.532,0.917) | 0.836(0.522,1.339) |
|  | *P* for trend | <0.001 | | 0.016 | 0.406 |
| Luteolin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.657(0.510,0.846) | | 0.764(0.582,1.003) | 0.785(0.591,1.042) |
|  | Q3 | 0.661(0.514,0.850) | | 0.826(0.629,1.083) | 0.862(0.632,1.174) |
|  | Q4 | 0.445(0.342,0.580) | | 0.606(0.456,0.806) | 0.662(0.432,1.015) |
|  | *P* for trend | <0.001 | | 0.002 | 0.099 |
|  |  | Hyperglycemia | | |  |
| Total | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.770(0.565,1.048) | | 0.850(0.615,1.175) | 0.895(0.635,1.261) |
|  | Q3 | 0.756(0.557,1.026) | | 0.856(0.621,1.180) | 0.939(0.636,1.387) |
|  | Q4 | 0.536(0.387,0.744) | | 0.620(0.437,0.879) | 0.765(0.418,1.400) |
|  | *P* for trend | <0.001 | | 0.009 | 0.458 |
| Quercetion | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.717(0.525,0.978) | | 0.797(0.576,1.102) | 0.816(0.579,1.148) |
|  | Q3 | 0.755(0.559,1.021) | | 0.826(0.600,1.137) | 0.853(0.585,1.245) |
|  | Q4 | 0.488(0.352,0.678) | | 0.561(0.395,0.797) | 0.604(0.339,1.077) |
|  | *P* for trend | <0.001 | | 0.002 | 0.125 |
| Kaempferol | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.753(0.554,1.023) | | 0.852(0.618,1.173) | 0.931(0.662,1.308) |
|  | Q3 | 0.654(0.477,0.897) | | 0.735(0.527,1.025) | 0.867(0.581,1.298) |
|  | Q4 | 0.595(0.433,0.818) | | 0.688(0.490,0.964) | 1.004(0.552,1.827) |
|  | *P* for trend | 0.002 | | 0.026 | 0.915 |
| Isorhamnetin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.745(0.548,1.014) | | 0.815(0.591,1.124) | 0.853(0.606,1.202) |
|  | Q3 | 0.705(0.519,0.958) | | 0.780(0.565,1.077) | 0.844(0.567,1.255) |
|  | Q4 | 0.534(0.386,0.738) | | 0.610(0.432,0.863) | 0.734(0.391,1.376) |
|  | *P* for trend | <0.001 | | 0.006 | 0.352 |
| Apigenin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.612(0.447,0.838) | | 0.640(0.461,0.888) | 0.680(0.482,0.961) |
|  | Q3 | 0.713(0.525,0.968) | | 0.751(0.546,1.034) | 0.856(0.579,1.266) |
|  | Q4 | 0.573(0.416,0.788) | | 0.630(0.452,0.879) | 0.833(0.462,1.503) |
|  | *P* for trend | 0.004 | | 0.026 | 0.712 |
| Luteolin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.752(0.552,1.024) | | 0.816(0.591,1.128) | 0.846(0.604,1.185) |
|  | Q3 | 0.748(0.551,1.016) | | 0.817(0.592,1.129) | 0.871(0.599,1.265) |
|  | Q4 | 0.501(0.360,0.696) | | 0.574(0.404,0.817) | 0.663(0.391,1.125) |
|  | *P* for trend | <0.001 | | 0.003 | 0.160 |
| Hypertriglyceridemia | | | | | |
| Total | Q1 | | 1 | 1 | 1 |
|  | Q2 | | 0.733(0.601,0.994) | 0.821(0.629,1.072) | 0.814(0.619,1.071) |
|  | Q3 | | 0.856(0.667,1.099) | 0.897(0.688,1.170) | 0.889(0.660,1.198) |
|  | Q4 | | 0.778(0.608,0.996) | 0.852(0.654,1.111) | 0.830(0.546,1.262) |
|  | *P* for trend | | 0.126 | 0.410 | 0.490 |
| Quercetion | Q1 | | 1 | 1 | 1 |
|  | Q2 | | 0.847(0.656,1.093) | 0.863(0.657,1.133) | 0.867(0.655,1.148) |
|  | Q3 | | 0.976(0.761,1.252) | 1.012(0.776,1.320) | 1.042(0.774,1.403) |
|  | Q4 | | 0.834(0.652,1.067) | 0.913(0.700,1.193) | 0.975(0.643,1.478) |
|  | *P* for trend | | 0.273 | 0.749 | 0.870 |
| Kaempferol | Q1 | | 1 | 1 | 1 |
|  | Q2 | | 0.794(0.618,1.021) | 0.830(0.636,1.082) | 0.818(0.621,1.077) |
|  | Q3 | | 0.832(0.647,1.070) | 0.851(0.651,1.111) | 0.835(0.616,1.134) |
|  | Q4 | | 0.782(0.611,1.002) | 0.850(0.653,1.108) | 0.807(0.519,1.256) |
|  | *P* for trend | | 0.110 | 0.361 | 0.381 |
| Isorhamnetin | Q1 | | 1 | 1 | 1 |
|  | Q2 | | 0.801(0.622.1.032) | 0.843(0.645,1.103) | 0.831(0.629,1.098) |
|  | Q3 | | 0.888(0.692,1.140) | 0.925(0.709,1.207) | 0.911(0.670,1.238) |
|  | Q4 | | 0.792(0.618,1.014) | 0.861(0.659,1.125) | 0.827(0.526.1.300) |
|  | *P* for trend | | 0.148 | 0.439 | 0.525 |
| Apigenin | Q1 | | 1 | 1 | 1 |
|  | Q2 | | 0.783(0.610,1.006) | 0.778(0.598,1.012) | 0.766(0.583,1.007) |
|  | Q3 | | 0.789(0.614,1.014) | 0.784(0.601,1.021) | 0.775(0.572,1.050) |
|  | Q4 | | 0.797(0.623,1.019) | 0.845(0.652,1.096) | 0.819(0.531,1.264) |
|  | *P* for trend | | 0.153 | 0.395 | 0.436 |
| Luteolin | Q1 | | 1 | 1 | 1 |
|  | Q2 | | 0.800(0.620,1.033) | 0.781(0.596,1.025) | 0.767(0.581,1.013) |
|  | Q3 | | 0.983(0.767,1.260) | 1.009(0.774,1.314) | 0.991(0.740,1.325) |
|  | Q4 | | 0.779(0.608,0.997) | 0.827(0.633,1.080) | 0.793(0.539,1.168) |
|  | *P* for trend | | <0.001 | 0.393 | 0.457 |
| Low-HDL | | | | | |
| Total | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.848(0.606,1.193) | | 0.795(0.552,1.143) | 0.856(0.582,1.259) |
|  | Q3 | 0.870(0.615,1.230) | | 0.833(0.579,1.198) | 0.958(0.615,1.493) |
|  | Q4 | 0.717(0.500,1.029) | | 0.590(0.398,0.874) | 0.768(0.388,1.521) |
|  | *P* for trend | 0.089 | | 0.013 | 0.551 |
| Quercetion | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.831(0.589,1.173) | | 0.809(0.561,1.167) | 0.884(0.802,1.298) |
|  | Q3 | 0.960(0.681,1.352) | | 0.906(0.629,1.304) | 1.063(0.690,1.638) |
|  | Q4 | 0.722(0.504,1.035) | | 0.611(0.413,0.905) | 0.828(0.435,1.575) |
|  | *P* for trend | 0.001 | | 0.023 | 0.729 |
| Kaempferol | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.827(0.589,1.160) | | 0.764(0.533,1.096) | 0.796(0.543,1.168) |
|  | Q3 | 0.835(0.592,1.179) | | 0.792(0.550,1.138) | 0.859(0.550,1.342) |
|  | Q4 | 0.653(0.453,0.942) | | 0.557(0.376,0.825) | 0.640(0.3171.291) |
|  | *P* for trend | 0.029 | | 0.006 | 0.267 |
| Isorhamnetin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.851(0.603,1.200) | | 0.792(0.549,1.142) | 0.881(0.596,1.303) |
|  | Q3 | 0.939(0.666,1.325) | | 0.901(0.627,1.294) | 1.098(0.698,1.727) |
|  | Q4 | 0.750(0.522,1.078) | | 0.614(0.413,0.912) | 0.914(0.445,1.874) |
|  | *P* for trend | 0.173 | | 0.028 | 0.990 |
| Apigenin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.684(0.486,0.963) | | 0.667(0.465,0.956) | 0.672(0.459,0.985) |
|  | Q3 | 0.763(0.543,1.071) | | 0.700(0.489,1.001) | 0.713(0.459,1.107) |
|  | Q4 | 0.574(0.398,0.828) | | 0.515(0.350,0.758) | 0.512(0.2551.028) |
|  | *P* for trend | 0.008 | | 0.002 | 0.080 |
| Luteolin | Q1 | 1 | | 1 | 1 |
|  | Q2 | 0.902(0.640,1.272) | | 0.888(0.618,1.277) | 0.970(0.665,1.413) |
|  | Q3 | 0.961(0.681,1.357) | | 0.876(0.605,1.269) | 1.033(0.676,1.580) |
|  | Q4 | 0.755(0.527,1.083) | | 0.637(0.430,0.944) | 0.870(0.484,1.564) |
|  | *P* for trend | 0.157 | | 0.026 | 0.707 |
| Adjusted for age in model 1; additionally adjusted for gender, smoking, drinking, labor, and body mass index based on model 1 in model 2; additionally adjusted for fat, protein, carbohydrate, fiber and total energy based on model 2 in model 3. | | | | | |
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**Supplementary Material**

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| --- | --- | --- | --- | --- |
| Table S2 The associations between the highest quartile of total and the specific flavonoids with the incidence of MetS and central obesity in male and female | | | | |
|  | Male | | Female | |
| RR(95% CI) | *P* value | RR(95% CI) | *P* value |
| Metabolic syndrome | | | | |
| Total flavonoids | 0.459(0.155,1.360) | 0.160 | 0.609(0.356,1.040) | 0.069 |
| Quercetin | 0.365(0.127,1.051) | 0.062 | 0.594(0.344,1.026) | 0.062 |
| Kaempferol | 0.373(0.125,1.116) | 0.078 | 0.618(0.344,1.113) | 0.109 |
| Isorhamnetin | 0.311(0.097,0.997) | 0.049 | 0.669(0.372,1.205) | 0.181 |
| Apigenin | 0.845(0.313,2.279) | 0.739 | 0.679(0.378,1.219) | 0.194 |
| Luteolin | 0.274(0.104,0.722) | 0.009 | 0.575(0.344,0.963) | 0.036 |
| Central obesity | | | | |
| Total flavonoids | 0.401(0.131,1.225) | 0.109 | 0.594(0.322,1.098) | 0.097 |
| Quercetin | 0.499(0.175,1.427) | 0.195 | 0.549(0.302,1.096) | 0.099 |
| Kaempferol | 0.325(0.104,1.020) | 0.054 | 0.467(0.244,1.091) | 0.081 |
| Isorhamnetin | 0.388(0.118,1.274) | 0.118 | 0.609(0.323,1.150) | 0.126 |
| Apigenin | 0.800(0.295,2.176) | 0.663 | 0.566(0.299,1.069) | 0.079 |
| Luteolin | 0.494(0.194,1.262) | 0.141 | 0.589(0.338,1.026) | 0.062 |
| Adjusted for age, drinking, smoking, physical activity, body mass index, fat, protein, carbohydrate, fiber and total energy. | | | | |

**Supplementary Material**

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| --- | --- | --- | --- | --- |
| Table S3 The associations of flavonoids from different sources with the incidence of MetS and its components | | | | |
| Flavonoids sources | | Metabolic Syndrome | | |
| Model 1 | Model 2 | Model 3 |
| vegetables | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.911(0.708,1.173) | 0.922(0.701,1.212) | 0.942(0.711,1.250) |
|  | Q3 | 0.794(0.613,1.029) | 0.917(0.693,1.212) | 0.955(0.695,1.312) |
|  | Q4 | 0.721(0.553,0.941) | 0.788(0.593,1.048) | 0.851(0.548,1.321) |
|  | *P* for trend | 0.011 | 0.106 | 0.504 |
| fruits | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.846(0.659,1.087) | 0.747(0.567,0.983) | 0.754(0.571,0.995) |
|  | Q3 | 0.609(0.468,0.793) | 0.588(0.441,0.785) | 0.594(0.441,0.802) |
|  | Q4 | 0.574(0.442,0.746) | 0.568(0.424,0.761) | 0.580(0.419,0.803) |
|  | *P* for trend | <0.001 | <0.001 | 0.001 |
| potatoes | Q1 | 1 | 1 | 1 |
|  | Q2 | 1.180(0.909,1.530) | 1.082(0.820,1.428) | 1.076(0.815,1.422) |
|  | Q3 | 1.028(0.789,1.339) | 1.009(0.761,1.337) | 1.009(0.760,1.338) |
|  | Q4 | 0.836(0.635,1.100) | 0.745(0.554,1.001) | 0.721(0.534,0.975) |
|  | *P* for trend | 0.043 | 0.012 | 0.008 |
| legumes | Q1 | 1 | 1 | 1 |
|  | Q2 | 1.055(0.814,1.366) | 0.963(0.731,1.270) | 0.968(0.733,1.279) |
|  | Q3 | 0.961(0.740,0.600) | 0.870(0.659,1.148) | 0.869(0.655,1.153) |
|  | Q4 | 0.786(0.600,1.028) | 0.737(0.552,0.983) | 0.711(0.526,0.961) |
|  | *P* for trend | 0.028 | 0.025 | 0.016 |
| Central Obesity | | | | |
| vegetables | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.901(0.685,1.185) | 0.933(0.687,1.266) | 0.889(0.648,1.220) |
|  | Q3 | 0.948(0.726,1.238) | 0.995(0.739,1.339) | 0.903(0.642,1.270) |
|  | Q4 | 1.089(0.831,1.426) | 1.015(0.751,1.372) | 0.834(0.521,1.336) |
|  | *P* for trend | 0.376 | 0.788 | 0.505 |
| fruits | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.905(0.688,1.192) | 0.760(0.555,1.039) | 0.737(0.538,1.010) |
|  | Q3 | 0.914(0.695,1.202) | 0.761(0.556,1.043) | 0.703(0.507,0.975) |
|  | Q4 | 1.013(0.774,1.326) | 0.809(0.590,1.110) | 0.685(0.478,0.981) |
|  | *P* for trend | 0.738 | 0.408 | 0.086 |
| potatoes | Q1 | 1 | 1 | 1 |
|  | Q2 | 1.120(0.857,1.465) | 1.035(0.767,1.397) | 1.028(0.761,1.389) |
|  | Q3 | 0.908(0.692,1.191) | 0.847(0.626,1.146) | 0.842(0.621,1.140) |
|  | Q4 | 0.818(0.620,1.081) | 0.733(0.538,1.000) | 0.721(0.525,0.988) |
|  | *P* for trend | 0.051 | 0.019 | 0.016 |
| legumes | Q1 | 1 | 1 | 1 |
|  | Q2 | 1.091(0.832,1.431) | 0.870(0.644,1.177) | 0.863(0.638,1.167) |
|  | Q3 | 0.963(0.732,1.266) | 0.843(0.622,1.142) | 0.831(0.612,1.130) |
|  | Q4 | 0.720(0.547,0.950) | 0.625(0.460,0.850) | 0.618(0.448,0.851) |
|  | *P* for trend | 0.003 | 0.002 | 0.003 |
| High blood Pressure | | | | |
| vegetables | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.809(0.633,1.033) | 0.798(0.614,1.036) | 0.838(0.639,1.100) |
|  | Q3 | 0.610(0.472,0.787) | 0.690(0.525,0.905) | 0.766(0.568,1.058) |
|  | Q4 | 0.627(0.485,0.809) | 0.732(0.558,0.959) | 0.879(0.575,1.342) |
|  | *P* for trend | <0.001 | 0.030 | 0.555 |
| fruits | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.756(0.588,0.972) | 0.821(0.625,1.078) | 0.858(0.651,1.131) |
|  | Q3 | 0.675(0.524,0.869) | 0.841(0.639,1.108) | 0.923(0.693,1.230) |
|  | Q4 | 0.562(0.434,0.728) | 0.785(0.590,1.044) | 0.949(0.690,1.307) |
|  | *P* for trend | <0.001 | 0.161 | 0.955 |
| potatoes | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.791(0.610,1.024) | 0.832(0.631,1.095) | 0.823(0.624,1.086) |
|  | Q3 | 0.980(0.764,1.257) | 1.053(0.807,1.374) | 1.040(0.796,1.360) |
|  | Q4 | 0.789(0.608,1.023) | 0.857(0.650,1.130) | 0.873(0.659,1.156) |
|  | *P* for trend | 0.180 | 0.455 | 0.591 |
| legumes | Q1 | 1 | 1 | 1 |
|  | Q2 | 1.258(0.972,1.628) | 1.179(0.896,1.551) | 1.181(0.895,1.557) |
|  | Q3 | 1.114(0.859,1.444) | 1.059(0.805,1.393) | 1.032(0.779,1.366) |
|  | Q4 | 1.029(0.791,1.340) | 1.012(0.766,1.338) | 0.964(0.718,1.294) |
|  | *P* for trend | 0.567 | 0.661 | 0.426 |
| Hyperglycemia | | | | |
| vegetables | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.760(0.560,1.030) | 0.749(0.546,1.029) | 0.814(0.584,1.134) |
|  | Q3 | 0.714(0.524,0.975) | 0.745(0.539,1.031) | 0.884(0.601,1.300) |
|  | Q4 | 0.670(0.489,0.917) | 0.703(0.506,0.976) | 0.982(.568,1.696) |
|  | *P* for trend | 0.020 | 0.062 | 0.944 |
| fruits | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.792(0.588,1.068) | 0.844(0.616,1.156) | 0.880(0.639,1.211) |
|  | Q3 | 0.615(0.450,0.840) | 0.656(0.471,0.914) | 0.713(0.502,1.013) |
|  | Q4 | 0.525(0.381,0.724) | 0.616(0.436,0.870) | 0.716(0.482,1.064) |
|  | *P* for trend | <0.001 | 0.004 | 0.086 |
| potatoes | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.831(0.604,1.144) | 0.849(0.609,1.183) | 0.837(0.600,1.167) |
|  | Q3 | 0.742(0.539,1.023) | 0.768(0.550,1.071) | 0.769(0.551,1.075) |
|  | Q4 | 0.822(0.601,1.123) | 0.846(0.612,1.174) | 0.838(0.603,1.166) |
|  | *P* for trend | 0.405 | 0.519 | 0.484 |
| legumes | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.830(0.607,1.136) | 0.803(0.580,1.111) | 0.801(0.578,1.111) |
|  | Q3 | 0.868(0.639,1.180) | 0.803(0.585,0.102) | 0.796(0.576,0.101) |
|  | Q4 | 0.784(0.571,1.075) | 0.762(0.550,1.055) | 0.718(0.508,1.014 |
|  | *P* for trend | 0.217 | 0.192 | 0.113 |
| Hypertriglyceridemia | | | | |
| vegetables | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.890(0.697,1.137) | 0.867(0.670,1.122) | 0.877(0.673,1.145) |
|  | Q3 | 0.871(0.682,1.112) | 0.903(0.697,1.171) | 0.938(0.701,1.254) |
|  | Q4 | 0.872(0.686,1.110) | 0.937(0.727,1.207) | 1.006(0.682,1.485) |
|  | *P* for trend | 0.382 | 0.822 | 0.848 |
| fruits | Q1 | 1 | 1 | 1 |
|  | Q2 | 1.117(0.868,1.436) | 1.023(0.782,1.339) | 1.003(0.766,1.315) |
|  | Q3 | 1.026(0.796,1.321) | 0.956(0.729,1.254) | 0.953(0.721,1.260) |
|  | Q4 | 0.990(0.772,1.271) | 1.036(0.790,1.359) | 1.060(0.785,1.431) |
|  | *P* for trend | 0.665 | 0.836 | 0.685 |
| potatoes | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.911(0.709,1.172) | 0.935(0.718,1.217) | 0.937(0.719,1.220) |
|  | Q3 | 0.970(0.758,1.242) | 1.023(0.789,1.328) | 1.031(0.794,1.340) |
|  | Q4 | 0.929(0.727,1.188) | 0.921(0.710,1.195) | 0.936(0.718,1.221) |
|  | *P* for trend | 0.714 | 0.595 | 0.706 |
| legumes | Q1 | 1 | 1 | 1 |
|  | Q2 | 1.096(0.855,1.404) | 1.058(0.816,1.370) | 1.055(0.813,1.369) |
|  | Q3 | 1.017(0.791,1.307) | 0.912(0.702,1.185) | 0.903(0.692,1.178) |
|  | Q4 | 1.111(0.871,1.416) | 1.056(0.818,1.363) | 1.006(0.770,1.315) |
|  | *P* for trend | 0.501 | 0.729 | 0.944 |
| Low-HDL | | | | |
| vegetables | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.922(0.660,1.287) | 0.931(0.657,1.318) | 0.964(0.669,1.391) |
|  | Q3 | 0.890(0.634,1.250) | 0.827(0.576,1.186) | 0.886(0.577,1.361) |
|  | Q4 | 0.634(0.437,0.919) | 0.594(0.403,0.875) | 0.658(0.348,1.243) |
|  | *P* for trend | 0.015 | 0.006 | 0.194 |
| fruits | Q1 | 1 | 1 | 1 |
|  | Q2 | 1.094(0.781,0.533) | 0.912(0.636,1.309) | 0.954(0.662,1.375) |
|  | Q3 | 0.777(0.542,1.114) | 0.671(0.457,0.986) | 0.761(0.509,1.138) |
|  | Q4 | 0.898(0.631,1.277) | 0.701(0.475,1.035) | 0.866(0.553,1.357) |
|  | *P* for trend | 0.317 | 0.049 | 0.479 |
| potatoes | Q1 | 1 | 1 | 1 |
|  | Q2 | 1.187(0.833,1.692) | 1.224(0.840,1.782) | 1.219(0.836,1.777) |
|  | Q3 | 1.208(0.849,1.719) | 1.245(0.855,1.812) | 1.258(0.862,1.837) |
|  | Q4 | 1.034(0.716,1.494) | 1.029(0.703,1.535) | 0.992(0.667,1.475) |
|  | *P* for trend | 0.832 | 0.776 | 0.600 |
| legumes | Q1 | 1 | 1 | 1 |
|  | Q2 | 0.946(0.674,1.326) | 0.967(0.676,1.382) | 1.004(0.700,1.440) |
|  | Q3 | 0.866(0.614,1.222) | 0.914(0.639,1.309) | 0.969(0.671,1.400) |
|  | Q4 | 0.638(0.444,0.917) | 0.687(0.470,1.006) | 0.699(0.467,1.045) |
|  | *P* for trend | 0.010 | 0.037 | 0.050 |
| Adjusted for age in model 1; additionally adjusted for gender, smoking, drinking, labor, and body mass index based on model 1 in model 2; additionally adjusted for fat, protein, carbohydrate, fiber and total energy based on model 2 in model 3. | | | | |
|

**Supplementary Material**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table S4 The associations between the highest quartile of flavonoids from different sources and the incidence of MetS and central obesity in male and female | | | | |
|  | Male | | Female | |
| RR(95%CI) | *P* value | RR(95%CI) | *P* value |
| Metabolicsyndrome | | | | |
| Vegetables | 0.676(0.275,1.665) | 0.395 | 0.891(0.532,1.492) | 0.661 |
| Fruits | 0.466(0.246,0.884) | 0.019 | 0.662(0.442,1.019) | 0.062 |
| Potatoes | 0.673(0.389,1.163) | 0.156 | 0.711(0.492,1.026) | 0.068 |
| Legumes | 0.725(0.429,1.224) | 0.229 | 0.697(0.479,1.014) | 0.059 |
| Centralobesity | | | | |
| Vegetables | 0.775(0.311,1.929) | 0.584 | 0.793(0.454,1.386) | 0.416 |
| Fruits | 0.774(0.405,1.480) | 0.439 | 0.673(0.426,1.064) | 0.090 |
| Potatoes | 0.512(0.291,1.002) | 0.052 | 0.853(0.578,1.258) | 0.422 |
| Legumes | 0.761(0.441,1.313) | 0.326 | 0.569(0.381,1.049) | 0.086 |
| Adjusted for age, drinking, smoking, physical activity, body mass index, fat, protein, carbohydrate, fiber and total energy. | | | | |