**Table S1. Mean and standard deviation of BMD in the reference population.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gender** | **Lumbar Mean (g/cm2)** | **Lumbar Std Dev** | **Femoral Mean (g/cm2)** | **Femoral Std Dev** |
| **Male** | 1.049755447 | 0.116636241 | 0.940196903 | 0.129920763 |
| **Female** | 1.048036873 | 0.112443543 | 0.873960089 | 0.118126423 |

**Table S2. Oxidative balance score assignment scheme.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Male** |  | **Female** |
| **OBS components** | **Property** | **0** | **1** | **2** |  | **0** | **1** | **2** |
| **Dietary OBS components** |  |  |  |  |  |  |  |  |
| Dietary fiber (g/d) | A | <10.85 | 10.85-17.45 | ≥17.45 |  | <9.55 | 9.55-14.95 | ≥14.95 |
| Carotene (RE/d) | A | <82.32 | 82.32-232.58 | ≥232.58 |  | <80.52 | 80.52-252.13 | ≥252.13 |
| Riboflavin (mg/d) | A | <1.63 | 1.63-2.41 | ≥2.41 |  | <1.34 | 1.34-1.96 | ≥1.96 |
| Niacin (mg/d) | A | <18.18 | 18.18-27.72 | ≥27.72 |  | <14.47 | 14.47-21.27 | ≥21.27 |
| Vitamin B6 (mg/d) | A | <1.42 | 1.42-2.21 | ≥2.21 |  | <1.15 | 1.15-1.75 | ≥1.75 |
| Total folate (mcg/d) | A | <286.00 | 286.00-447.00 | ≥447.00 |  | <239.50 | 239.50-367.00 | ≥367.00 |
| Vitamin B12 (mcg/d) | A | <3.33 | 3.33-5.78 | ≥5.78 |  | <2.53 | 2.53-4.45 | ≥4.45 |
| Vitamin C (mg/d) | A | <44.65 | 44.65-101.35 | ≥101.35 |  | <42.30 | 42.30-94.07 | ≥94.07 |
| Vitamin E (ATE) (mg/d) | A | <4.88 | 4.88-7.98 | ≥7.98 |  | <4.24 | 4.24-6.86 | ≥6.86 |
| Calcium (mg/d) | A | <701.00 | 701.00-1099.00 | ≥1099.00 |  | <594.00 | 594.00-920.50 | ≥920.50 |
| Magnesium (mg/d) | A | <208.00 | 208.00-307.50 | ≥307.50 |  | <177.50 | 177.50-253.50 | ≥253.50 |
| Zinc (mg/d) | A | <8.53 | 8.53-13.05 | ≥13.05 |  | <6.79 | 6.79-10.06 | ≥10.06 |
| Copper (mg/d) | A | <0.87 | 0.87-1.30 | ≥1.30 |  | <0.75 | 0.75-1.09 | ≥1.09 |
| Selenium (mcg/d) | A | <81.75 | 81.75-124.30 | ≥124.30 |  | <66.05 | 66.05-96.51 | ≥96.51 |
| Total fat (g/d) | P | ≥90.73 | 59.08-90.73 | <59.08 |  | ≥72.50 | 48.24-72.50 | <48.24 |
| Iron (mg/d) | P | ≥17.54 | 11.74-17.54 | <11.74 |  | ≥14.06 | 9.56-14.06 | <9.56 |
| **Lifestyle OBS components** |  |  |  |  |  |  |  |  |
| Physical activity (MET-minute/week) | A | <567.00 | 567.00-2880.00 | ≥2880.00 |  | <472.50 | 472.50-1680.00 | ≥1680.00 |
| Alcohol (g/d) | P | ≥30 | 0-30 | None |  | ≥15 | 0-15 | None |
| Body mass index (kg/m2) | P | ≥27.50 | 21.50-27.50 | <21.50 |  | ≥28.25 | 21.50-28.25 | <21.50 |
| Cotinine (ng/mL) | P | ≥0.49 | 0.03-0.49 | <0.03 |  | ≥0.13 | 0.02-0.13 | <0.02 |

OBS: oxidative balance score; A: antioxidant; P: prooxidant; RE: retinol equivalent; ATE: alpha-tocopherol equivalent; MET: metabolic equivalent.

**Table S3. Association between OBS/DOBS/LOBS and all-cause mortality in osteoporotic adults, excluding participants who died within the first two years of follow-up. (weighted)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Characteristic** | **Model 1** |  |  | **Model 2** |  |  | **Model 3** |  |
|  | **HR (95% CI)** | ***P* value** |  | **HR (95% CI)** | ***P* value** |  | **HR (95% CI)** | ***P* value** |
| All-cause mortality |  |  |  |  |  |  |  |  |
| OBS (continuous) | 0.95(0.93,0.98) | 0.0010 |  | 0.95(0.93,0.98) | 0.0006 |  | 0.96(0.94,0.99) | 0.0106 |
| OBS (category) |  |  |  |  |  |  |  |  |
| Low[5,17) | Ref |  |  | Ref |  |  | Ref |  |
| Medium[17,23) | 0.68(0.46,1.01) | 0.0562 |  | 0.68(0.45,1.02) | 0.0625 |  | 0.81(0.51,1.30) | 0.3915 |
| High[23,36] | 0.55(0.35,0.86) | 0.0083 |  | 0.59(0.39,0.89) | 0.0114 |  | 0.70(0.47,1.05) | 0.0873 |
| ***P* for trend** | 0.0086 |  | 0.0124 |  | 0.0876 |
| DOBS (continuous) | 0.95(0.92,0.98) | 0.0020 |  | 0.96(0.93,0.98) | 0.0024 |  | 0.97(0.94,0.99) | 0.0395 |
| DOBS (category) |  |  |  |  |  |  |  |  |
| Low[3,13) | Ref |  |  | Ref |  |  | Ref |  |
| Medium[13,19) | 0.66(0.42,1.02) | 0.0617 |  | 0.66(0.43,1.02) | 0.0625 |  | 0.79(0.51,1.21) | 0.2811 |
| High[19,29] | 0.59(0.36,0.97) | 0.0385 |  | 0.64(0.42,0.99) | 0.0486 |  | 0.79(0.53,1.18) | 0.2503 |
| ***P* for trend** | 0.0421 |  | 0.0541 |  | 0.2842 |
| LOBS (continuous) | 0.89(0.78,1.02) | 0.1013 |  | 0.85(0.76,0.95) | 0.0054 |  | 0.79(0.67,0.93) | 0.0057 |
| LOBS (category) |  |  |  |  |  |  |  |  |
| Low[1,4) | Ref |  |  | Ref |  |  | Ref |  |
| Medium[4,5) | 0.98(0.54,1.79) | 0.9603 |  | 0.96(0.52,1.79) | 0.9096 |  | 0.72(0.40,1.29) | 0.2701 |
| High[5,7] | 0.64(0.43,0.95) | 0.0259 |  | 0.59(0.39,0.89) | 0.0110 |  | 0.44(0.25,0.78) | 0.0047 |
| ***P* for trend** | 0.0115 |  | 0.0022 |  | 0.0036 |

Model 1, unadjusted; Model 2, adjusted for age group, gender, race; Model 3, adjusted for age group, gender, race, education level, family PIR, BMI, calcium, phosphorus, 25-OHD, hip fracture history, spinal fracture history, OP treatment history, hypertension history, dyslipidemia history, CVD history, diabetes history, thyroid disease history, liver disease history, cancer history, and kidney failure history