Supplementary Table 1. Stratified analyses between tertiles of 25-(OH)-D3 and osteosarcopenic obesity\*

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| **Exposure** | **25-(OH)-D3, OR (95% CI)** |  |
| **Tertile 1** | **Tertile 2** | **Tertile 3** | ***P* for interaction** |
| **SBP group (mmHg)** |  |  |  | 0.633 |
| **<139.00 (N=2295)** | 1.0 (Reference) | **0.60 (0.42-0.86)** | 0.84 (0.60-1.19) |  |
| **≥139.00 (N=2184)** | 1.0 (Reference) | 0.93 (0.68-1.25) | **0.68 (0.48-0.95)** |  |
| **DBP group (mmHg)** |  |  |  | 0.263 |
| **<80.00 (N=2516)** | 1.0 (Reference) | **0.71 (0.52-0.96)** | **0.71 (0.52-0.97)** |  |
| **≥80.00 (N=1955)** | 1.0 (Reference) | 0.89 (0.62-1.28) | 0.87 (0.60-1.26) |  |
| **ALT group (U/L)** |  |  |  | 0.989 |
| **<17.65 (N=2189)** | 1.0 (Reference) | 0.78 (0.57-1.08) | 0.86 (0.62-1.20) |  |
| **≥17.65 (N=2189)** | 1.0 (Reference) | 0.77 (0.55-1.07) | **0.67 (0.47-0.96)** |  |
| **Creatinine group (μmol/L)** |  |  |  | 0.916 |
| **<67.60 (N=2245)** | 1.0 (Reference) | **0.69 (0.50-0.95)** | 0.83 (0.60-1.16) |  |
| **≥67.60 (N=2231)** | 1.0 (Reference) | 0.88 (0.62-1.23) | 0.72 (0.50-1.02) |  |
| **TG group (mmol/L)** |  |  |  | 0.532 |
| **<1.41 (N=2224)** | 1.0 (Reference) | 0.92 (0.66-1.30) | 0.93 (0.65-1.32) |  |
| **≥1.41 (N=2204)** | 1.0 (Reference) | **0.69 (0.50-0.95)** | **0.66 (0.47-0.91)** |  |
| **HDL-C group (mmol/L)** |  |  |  | 0.406 |
| **<1.31 (N=2262)** | 1.0 (Reference) | 0.73 (0.53-1.02) | **0.71 (0.50-0.997)** |  |
| **≥1.31 (N=2169)** | 1.0 (Reference) | 0.84 (0.60-1.16) | 0.83 (0.59-1.16) |  |
| **FBG group (mmol/L)** |  |  |  | 0.282 |
| **<5.60 (N=2170)** | 1.0 (Reference) | 0.75 (0.53-1.05) | **0.69 (0.48-0.99)** |  |
| **≥5.60 (N=2166)** | 1.0 (Reference) | 0.81 (0.59-1.12) | 0.83 (0.60-1.15) |  |
| **Age group (years)** |  |  |  | 0.651 |
| **<60 (N=401)** | 1.0 (Reference) | 6.21 (0.82-47.27) | 2.66 (0.32-22.04) |  |
| **≥60 (N=4105)** | 1.0 (Reference) | **0.76 (0.60-0.96)** | **0.76 (0.60-0.97)** |  |
| **Education** |  |  |  | 0.481 |
| **≤Junior high school (N=2612)** | 1.0 (Reference) | **0.73 (0.55-0.97)** | 0.83 (0.62-1.11) |  |
| **>Junior high school (N=1578)** | 1.0 (Reference) | 0.87 (0.59-1.28) | **0.62 (0.41-0.95)** |  |
| **Gender** |  |  |  | 0.068 |
| **Male (N=1601)** | 1.0 (Reference) | **0.59 (0.37-0.94)** | **0.55 (0.34-0.88)** |  |
| **Female (N=2905)** | 1.0 (Reference) | 0.85 (0.65-1.11) | 0.87 (0.66-1.15) |  |
| **Regular exercise** |  |  |  | 0.546 |
| **No (N=929)** | 1.0 (Reference) | 0.86 (0.70-1.06) | 0.84 (0.68-1.03) |  |
| **Yes (N=3328)** | 1.0 (Reference) | 1.16 (0.81-1.66) | 0.92 (0.62-1.36) |  |
| **Smoking status** |  |  |  | 0.473 |
| **No (N=571)** | 1.0 (Reference) | 0.49 (0.22-1.11) | **0.33 (0.14-0.79)** |  |
| **Yes (N=3257)** | 1.0 (Reference) | 0.81 (0.64-1.03) | 0.83 (0.64-1.06) |  |
| **Drinking status** |  |  |  | 0.978 |
| **No (N=3092)** | 1.0 (Reference) | 0.72 (0.33-1.55) | 0.55 (0.25-1.20) |  |
| **Yes (N=503)** | 1.0 (Reference) | **0.77 (0.61-0.99)** | 0.79 (0.61-1.02) |  |
| **Pension status** |  |  |  | 0.375 |
| **No (N=362)** | 1.0 (Reference) | 0.44 (0.17-1.10) | 0.48 (0.20-1.11) |  |
| **Yes (N=3829)** | 1.0 (Reference) | 0.81 (0.64-1.03) | 0.79 (0.62-1.02) |  |
| \*Adjusted for Age (<60 years, ≥60 years); DBP (mmHg); SBP (mmHg); ALT (U/L); Creatinine (μmol/L); TG (mmol/L); HDL-C (mmol/L); FBG (mmol/L); Gender (female, male); Pension status (Yes, No); Education (≤primary school, Junior high school, Senior high school and ≥junior college ); Regular exercise (Yes, No); Smoking status (Yes, No); and Drinking status (Yes, No). Of note, variables examined in this table were not adjusted.Abbreviations: ALT, alanine aminotransferase; CI, confidence interval; DBP, diastolic blood pressure; FBG, fasting blood glucose.; HDL-C, high density lipoprotein cholesterol; OR, odds ratio; SBP, systolic blood pressure; TG, triglycerides  |

Supplementary Table 2. Stratified analyses between deficiency of serum vitamin D3 and osteosarcopenic obesity\*

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| **Exposure** | **Deficiency of serum vitamin D3, OR (95% CI)** | ***P* for interaction** |
| **No** | **Yes** |
| **SBP group (mmHg)** |  |  | 0.616 |
| **<139.00 (N=2295)** | 1.0 (Reference) | **1.36 (1.02-1.81)** |  |
| **≥139.00 (N=2184)** | 1.0 (Reference) | **1.34 (1.03-1.74)** |  |
| **DBP group (mmHg)** |  |  | **0.024** |
| **<80.00 (N=2516)** | 1.0 (Reference) | **1.48 (1.15-1.92)** |  |
| **≥80.00 (N=1955)** | 1.0 (Reference) | 1.15 (0.85-1.56) |  |
| **ALT group (U/L)** |  |  | 0.623 |
| **<17.65 (N=2189)** | 1.0 (Reference) | 1.08 (0.83-1.42) |  |
| **≥17.65 (N=2189)** | 1.0 (Reference) | **1.71 (1.28-2.27)** |  |
| **Creatinine group (μmol/L)** |  |  | 0.923 |
| **<67.60 (N=2245)** | 1.0 (Reference) | **1.38 (1.05-1.81)** |  |
| **≥67.60 (N=2231)** | 1.0 (Reference) | 1.29 (0.97-1.72) |  |
| **TG group (mmol/L)** |  |  | 0.180 |
| **<1.41 (N=2224)** | 1.0 (Reference) | 1.26 (0.94-1.68) |  |
| **≥1.41 (N=2204)** | 1.0 (Reference) | **1.42 (1.09-1.86)** |  |
| **HDL-C group (mmol/L)** |  |  | 0.877 |
| **<1.31 (N=2262)** | 1.0 (Reference) | 1.29 (0.98-1.71) |  |
| **≥1.31 (N=2169)** | 1.0 (Reference) | **1.38 (1.04-1.81)** |  |
| **FBG group (mmol/L)** |  |  | 0.231 |
| **<5.60 (N=2170)** | 1.0 (Reference) | **1.43 (1.07-1.91)** |  |
| **≥5.60 (N=2166)** | 1.0 (Reference) | 1.27 (0.97-1.67) |  |
| **Age group (years)** |  |  | 0.508 |
| **<60 (N=401)** | 1.0 (Reference) | 0.67 (0.15-2.96) |  |
| **≥60 (N=4105)** | 1.0 (Reference) | **1.35 (1.11-1.65)** |  |
| **Education** |  |  | 0.674 |
| **≤Junior high school (N=2612)** | 1.0 (Reference) | **1.33 (1.04-1.68)** |  |
| **>Junior high school (N=1578)** | 1.0 (Reference) | **1.43 (1.02-1.99)** |  |
| **Gender** |  |  | 0.108 |
| **Male (N=1601)** | 1.0 (Reference) | **1.75 (1.19-2.59)** |  |
| **Female (N=2905)** | 1.0 (Reference) | 1.22 (0.97-1.53) |  |
| **Regular exercise** |  |  | 0.310 |
| **No (N=929)** | 1.0 (Reference) | 1.26 (0.84-1.89) |  |
| **Yes (N=3328)** | 1.0 (Reference) | **1.35 (1.08-1.69)** |  |
| **Smoking status** |  |  | 0.716 |
| **No (N=571)** | 1.0 (Reference) | **2.44 (1.21-4.89)** |  |
| **Yes (N=3257)** | 1.0 (Reference) | **1.27 (1.03-1.55)** |  |
| **Drinking status** |  |  | 0.526 |
| **No (N=3092)** | 1.0 (Reference) | **2.05 (1.08-3.87)** |  |
| **Yes (N=503)** | 1.0 (Reference) | **1.3 (1.06-1.60)** |  |
| **Pension status** |  |  | 0.653 |
| **No (N=362)** | 1.0 (Reference) | **2.21 (1.06-4.57)** |  |
| **Yes (N=3829)** | 1.0 (Reference) | **1.30 (1.06-1.60)** |  |
| \*Adjust for Age (<60 years, ≥60 years); DBP (mmHg); SBP (mmHg); ALT (U/L); Creatinine (μmol/L); TG (mmol/L); HDL-C (mmol/L); FBG (mmol/L); Gender (Female, Male); Pension status (Yes, No); Education (≤primary school, Junior high school, senior high school and ≥junior college ); Regular exercise ( Yes, No); Smoking status (Yes, No); Drinking status (Yes, No). Of note, variables examined in this table were not adjusted.Abbreviations: ALT, alanine aminotransferase; CI, confidence interval; DBP, diastolic blood pressure; FBG, fasting blood glucose.; HDL-C, high density lipoprotein cholesterol; OR, odds ratio; SBP, systolic blood pressure; TG, triglyceride |