

Supplementary Figure 1. Effect of resveratrol intervention on HbA1c values. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. HbA1C, glycated hemoglobin; CVD, cardiovascular diseases; Met, metabolic syndrome; T2DM, type 2 diabetes mellitus.



Supplementary Figure 2. Effect of resveratrol intervention on insulin concentrations. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; T2DM, type 2 diabetes mellitus.



Supplementary Figure 3. Meta-analysis of the effects of resveratrol intervention on HOMA-IR values. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. HOMA-IR, homeostasis model assessment of insulin resistance; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; T2DM, type 2 diabetes mellitus.



Supplementary Figure 4. Meta-analysis of the effects of resveratrol intervention on HDL-C concentrations. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. HOMA-IR, homeostasis model assessment of insulin resistance. HDL-C, high-density lipoprotein cholesterol; CVD, cardiovascular diseases; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; SZ, schizophrenia; T2DM, type 2 diabetes mellitus.



Supplementary Figure 5. Meta-analysis of the effects of resveratrol intervention on LDL-C concentrations. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. LDL-C, low-density lipoprotein cholesterol; CVD, cardiovascular diseases; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; SZ, schizophrenia; T2DM, type 2 diabetes mellitus.



Supplementary Figure 6. Meta-analysis of the effects of resveratrol intervention on TAG concentrations. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. TAG, triglyceride; CVD, cardiovascular diseases; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; SZ, schizophrenia; T2DM, type 2 diabetes mellitus.



Supplementary Figure 7. Meta-analysis of the effects of resveratrol intervention on SBP. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. SBP, systolic blood pressure; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; T2DM, type 2 diabetes mellitus.



Supplementary Figure 8. Meta-analysis of the effects of resveratrol intervention on DBP. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. DBP, diastolic blood pressure; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; T2DM, type 2 diabetes mellitus.



Supplementary Figure 9. Meta-analysis of the effects of resveratrol intervention on ALT concentrations. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. ALT, alanine aminotransferase; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; T2DM, type 2 diabetes mellitus.



Supplementary Figure 10. Meta-analysis of the effects of resveratrol intervention on AST concentrations. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. AST, aspartate aminotransferase; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; T2DM, type 2 diabetes mellitus.



Supplementary Figure 11. Meta-analysis of the effects of resveratrol intervention on TNF-α concentrations. The pooled effect was calculated by using a random-effects model. The diamond represents the overall estimated effect, and the horizontal lines denote 95% CI. TNF-α, tumor necrosis factor-α; CVD, cardiovascular diseases; Met, metabolic syndrome; NAFLD, non-alcoholic fatty liver disease; T2DM, type 2 diabetes mellitus; UC, ulcerative colitis.

Supplementary Table 1 Subgroup and meta-regression analyses for insulin, HOMA-IR and SBP levels

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Factors stratified | Insulin mU/L | | | | | HOMA-IR | | | | | SBP mmHg | | | | |
| No. | Pooled effect  (95% CI), U/L | Heterogeneity | | *Pb* | No. | Pooled effect  (95% CI), U/L | Heterogeneity | | *Pb* | No. | Pooled effect  (95% CI), mg/dL | Heterogeneity | | *Pb* |
|  |  |  | I2 (%) | *Pa* |  |  |  | I2 (%) | *Pa* |  |  |  | I2 (%) | *Pa* |  |
| Mean age, year |  |  |  |  | 0.275 |  |  |  |  | 0.569 |  |  |  |  | 0.075 |
| < 60 | 4 | 1.20 (-0.71, 3.10) | 0.00 | 0.523 |  | 8 | -0.41 (-0.91, 0.08) | 77.1% | < 0.001 |  | 8 | -7.05 (-14.66, 0.55) | 91.6% | < 0.001 |  |
| ≥ 60 | 7 | -0.84 (-2.46, 0.77) | 71.0% | 0.002- |  | 2 | 0.16 (-0.50, 0.82) | 0.00% | 0.654 |  | 5 | 0.46 (-1.81, 2.74) | 0.00 | 0.689 |  |
| Health status |  |  |  |  | 0.045 |  |  |  |  | 0.365 |  |  |  |  | 0.129 |
| Healthy | 4 | 0.35 (-0.03, 0.74) | 0.00 | 0.419 |  | 4 | -0.02 (-0.18, 0.14) | 0.0% | 0.683 |  | 6 | -0.08 (-2.28, 2.12) | 0.00 | 0.464 |  |
| NCDs | 7 | -1.75 (-3.49, -0.01) | 30.5% | 0.195 |  | 6 | -0.63 (-1.54, 0.28) | 79.8% | < 0.001 |  | 7 | -7.03 (-15.45, 1.40) | 92.4% | < 0.001 |  |
| Various NCDs |  |  |  |  | 0.188 |  |  |  |  | 0.183 |  |  |  |  | 0.050 |
| Met | 1 | -1.50 (-9.43, 6.43) | 0.00 | 1.00 |  | 1 | -0.40 (-2.94, 2.14) | 0.00 | 1.00 |  | 1 | 0.00 (-9.45, 9.45) | 0.00 | 1.00 |  |
| T2DM | 3 | -2.75 (-6.04, 0.53) | 40.0% | 0.189 |  | 2 | -1.48 (-4.49, 1.52) | 87.5% | 0.005 |  | 3 | -14.41 (-21.81, -7.01) | 83.4% | 0.002 |  |
| NAFLD | 3 | -0.71 (-2.56, 1.15) | 0.00 | 0.747 |  | 3 | -0.18 (-0.74, 0.38) | 48.2% | 0.145 |  | 3 | -1.05 (-7.64, 5.55) | 35.1% | 0.214 |  |
| Dose of resveratrol intake |  |  |  |  | 0.185 |  |  |  |  | 0.733 |  |  |  |  | 0.075 |
| < 500 mg | 6 | 0.31 (-0.07, 0.69) | 0.00 | 0.449 |  | 5 | -0.13 (-0.41, 0.14) | 26.3% | 0.246 |  | 8 | -5.49 (-13.85, 2.87) | 92.3% | < 0.001 |  |
| ≥ 500 mg | 5 | -1.29 (-3.73, 1.17) | 59.0% | 0.045 |  | 5 | -0.49 (-1.61, 0.63) | 83.8% | < 0.001 |  | 5 | -1.60 (-5.68, 2.48) | 8.1% | 0.352 |  |
| Duration |  |  |  |  | 0.355 |  |  |  |  | 0.753 |  |  |  |  | 0.202 |
| < 3 mon | 7 | -0.96 (-3.01, 1.10) | 56.4% | 0.033 |  | 6 | -0.46 (-1.30, 0.39) | 81.3% | < 0.001 |  | 6 | -0.06 (-5.13, 5.02) | 19.3% | 0.294 |  |
| ≥ 3 mon | 4 | 0.37 (-0.94, 1.67) | 33.8% | 0.210 |  | 4 | -0.15 (-0.48, 0.17) | 25.3% | 0.260 |  | 7 | -6.16 (-14.69, 2.37) | 97.2% | < 0.001 |  |

Abbreviations: CI, confidential interval; MOMA-IR, homeostasis model assessment of insulin resistance; NCDs, non-communicable diseases; No., number of included studies; SBP, systolic blood pressure; *Pa* heterogeneity; *Pb* for meta-regression analysis.

Supplementary Table 2 Subgroup and meta-regression analyses for HDL-C, TAG and TNF-α concentrations

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Factors stratified | HDL-C mg/dL | | | | | TAG mg/dL | | | | | TNF-α μg/L | | | | |
| No. | Pooled effect  (95% CI), U/L | Heterogeneity | | *Pb* | No. | Pooled effect  (95% CI), U/L | Heterogeneity | | *Pb* | No. | Pooled effect  (95% CI), mg/dL | Heterogeneity | | *Pb* |
|  |  |  | I2 (%) | *Pa* |  |  |  | I2 (%) | *Pa* |  |  |  | I2 (%) | *Pa* |  |
| Mean age, year |  |  |  |  | 0.105 |  |  |  |  | 0.200 |  |  |  |  | 0.719 |
| < 60 | 13 | -0.36 (-1.24, 0.53) | 0.0% | 0.579 |  | 14 | -2.93 (-11.12, 5.26) | 49.1% | 0.020 |  | 6 | -0.39 (-0.95, 0.17) | 0.00% | 0.459 |  |
| ≥ 60 | 7 | 1.68 (-1.18, 4.54) | 34.4% | 0.166 |  | 6 | 11.04 (-22.64, 44.73) | 84.5% | < 0.001 |  | 4 | -0.52 (-1.63, 0.59) | 30.1% | 0.210 |  |
| Health status |  |  |  |  | 0.307 |  |  |  |  | 0.355 |  |  |  |  | 0.575 |
| Healthy | 6 | -1.06 (-4.34, 2.22) | 0.0% | 0.778 |  | 7 | 6.17 (0.09, 12.24) | 0.00 | 0.794 |  | 2 | 1.03 (-2.95, 5.02) | 34.3% | 0.217 |  |
| NCDs | 14 | 0.02 (-1.50, 1.54) | 31.8% | 0.122 |  | 13 | -3.56 (-21.43, 14.30) | 82.6% | < 0.001 |  | 8 | -0.37 (-0.768, 0.03) | 12.3% | 0.334 |  |
| Various NCDs |  |  |  |  | 0.954 |  |  |  |  | 0.793 |  |  |  |  | 0.572 |
| Met | 2 | 1.02 (-4.48, 6.52) | 0.00 | 0.613 |  | 2 | -8.77 (-36.83, 19.29) | 0.00 | 0.892 |  | 1 | -2.20 (-9.36, 1.63) | 0.00 | 1.00 |  |
| CVD | 2 | -2.39 (-8.35, 3.58) | 0.00 | 0.606 |  | 2 | -0.22 (-29.08, 28.65) | 0.00 | 0.786 |  | 2 | -0.66 (-2.65, 1.33) | 0.00 | 0.351 |  |
| T2DM | 5 | -0.97 (-4.79, 2.85) | 75.0% | 0.003 |  | 5 | -11.96 (-36.34, 12.43) | 78.5% | 0.003 |  | 0 |  |  |  |  |
| NAFLD | 4 | 0.70 (-1.34, 2.74) | 0.00 | 0.743 |  | 4 | 6.52 (-44.15, 57.19) | 90.2% | < 0.001 |  | 4 | -0.36 (-0.84, 0.12) | 35.4% | 0.20 |  |
| Dose of resveratrol intake |  |  |  |  | 0.448 |  |  |  |  | 0.083 |  |  |  |  | 0.800 |
| < 500 mg | 14 | 0.23 (-1.20, 1.67) | 10.4% | 0.339 |  | 16 | -2.49 (-9.78, 4.81) | 43.5% | 0.032 |  | 5 | -0.37 (-0.93, 0.19) | 0.00% | 0.526 |  |
| ≥ 500 mg | 6 | -0.94 (-3.39, 1.51) | 26.6% | 0.235 |  | 4 | 10.41 (-41.58, 62.39) | 81.0% | < 0.001 |  | 5 | -0.69 ( -1.78, 0.41) | 39.7% | 0.157 |  |
| Duration |  |  |  |  | 0.842 |  |  |  |  | 0.367 |  |  |  |  | 0.324 |
| < 3 mon | 10 | -0.40 (-2.87, 2.08) | 51.6% | 0.029 |  | 9 | 3.82 (-25.94, 33.58) | 76.6% | < 0.001 |  | 5 | -1.02 (-2.49, 0.46) | 24.5% | 0.258 |  |
| ≥ 3 mon | 10 | -0.03 (-0.96, 0.91) | 0.0% | 0.951 |  | 11 | -2.69 (-11.10, 5.73) | 58.0% | 0.008 |  | 5 | -0.25 (-0.54, 0.04) | 0.00% | 0.491 |  |

Abbreviations: CI, confidential interval; HDL-C, high-density lipoprotein cholesterol; TAG, triglyceride; TNF-α, tumor necrosis factor; NCDs, non-communicable diseases; No., number of included studies; *Pa* for heterogeneity; *Pb* for meta-regression analysis.

Supplementary Table 3 Subgroup and meta-regression analyses for ALT and AST levels

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Factors stratified | ALT IU/L | | | | | AST IU/L | | | | |
| No. | Pooled effect  (95% CI), U/L | Heterogeneity | | *Pb* | No. | Pooled effect  (95% CI), U/L | Heterogeneity | | *Pb* |
|  |  |  | I2 (%) | *Pa* |  |  |  | I2 (%) | *Pa* |  |
| Mean age, year |  |  |  |  | 0.142 |  |  |  |  | 0.046 |
| < 60 | 8 | -3.67 (-7.38, 0.05) | 47.9% | 0.062 |  | 6 | -4.81 (-7.74, -1.87) | 59.5% | 0.030 |  |
| ≥ 60 | 4 | -0.23 (-1.98, 1.52) | 50.7% | 0.107 |  | 4 | 0.44 (-2.45, 3.33) | 86.8% | <0.001 |  |
| Health status |  |  |  |  | 0.547 |  |  |  |  | 0.871 |
| Healthy | 5 | -0.48 (-1.27, 0.32) | 0.00% | 0.703 |  | 4 | -2.16 (-5.71, 1.40) | 91.3% | <0.001 |  |
| NCDs | 7 | -1.98 (-7.00, 3.04) | 70.2% | 0.003 |  | 6 | -2.74 (-5.73, 0.25) | 63.0% | 0.019 |  |
| Various NCDs |  |  |  |  | 0.987 |  |  |  |  | 0.495 |
| Met | 1 | -4.20 (-11.42, 3.02) | 0.00 | 1.00 |  | 1 | -2.20 (-6.81, 2.41) | 0.00 | 1.00 |  |
| T2DM | 2 | 3.33 (-10.80, 17.46) | 50.2% | 0.157 |  | 1 | -1.00 (-4.20, 2.20) | 0.00 | 1.00 |  |
| NAFLD | 4 | -3.54 (-14.27, 7.19) | 76.2% | 0.006 |  | 4 | -3.57 (-7.81, 0.67) | 41.7% | 0.161 |  |
| Dose of resveratrol intake |  |  |  |  | < 0.001 |  |  |  |  | 0.020 |
| < 500 mg | 4 | -4.55 (-7.81, -1.29) | 37.2% | 0.189 |  | 4 | -5.65 (-8.79 -2.51) | 52.2% | 0.099 |  |
| ≥ 500 mg | 8 | -0.26 (-2.01, 1.48) | 35.9% | 0.142 |  | 6 | 0.06 (-2.38, 2.50) | 78.9% | <0.001 |  |
| Duration |  |  |  |  | 0.590 |  |  |  |  | 0.682 |
| < 3 mon | 6 | -0.72 (-8.16, 6.72) | 56.9% | 0.041 |  | 5 | -1.97 (-4.35, 0.40) | 9.7% | 0.351 |  |
| ≥ 3 mon | 6 | -2.23 (-5.24, 0.78) | 89.9% | <0.001 |  | 5 | -3.20 (-7.36, 0.96) | 97.0% | <0.001 |  |

Abbreviations: CI, confidential interval; ALT, alanine aminotransferase; AST, aspartate aminotransferase; NCDs, non-communicable diseases; No., number of included studies; *Pa* for heterogeneity; *Pb* for meta-regression analysis.



Supplementary Figure 12. Sensitivity analysis for fating glucose concentrations



Supplementary Figure 13. Sensitivity analysis for insulin concentrations



Supplementary Figure 14. Sensitivity analysis for HOMA-IR values



Supplementary Figure 15. Sensitivity analysis for HbA1C values



Supplementary Figure 16. Sensitivity analysis for TC concentrations



Supplementary Figure 17. Sensitivity analysis for HDL-C concentrations



Supplementary Figure 18. Sensitivity analysis for LDL-C concentrations



Supplementary Figure 19. Sensitivity analysis for TAG concentrations



Supplementary Figure 20. Sensitivity analysis for SBP levels



Supplementary Figure 21. Sensitivity analysis for DBP levels



Supplementary Figure 22. Sensitivity analysis for ALT concentrations



Supplementary Figure 23. Sensitivity analysis for AST concentrations



Supplementary Figure 24. Sensitivity analysis for CRP concentrations



Supplementary Figure 25. Sensitivity analysis for TNF-α concentrations