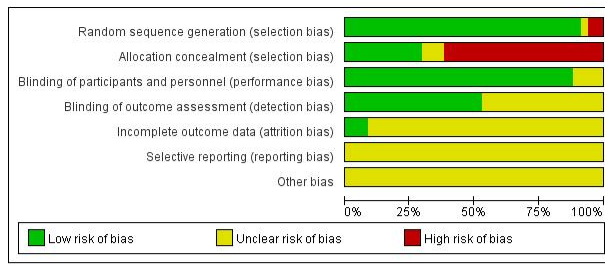
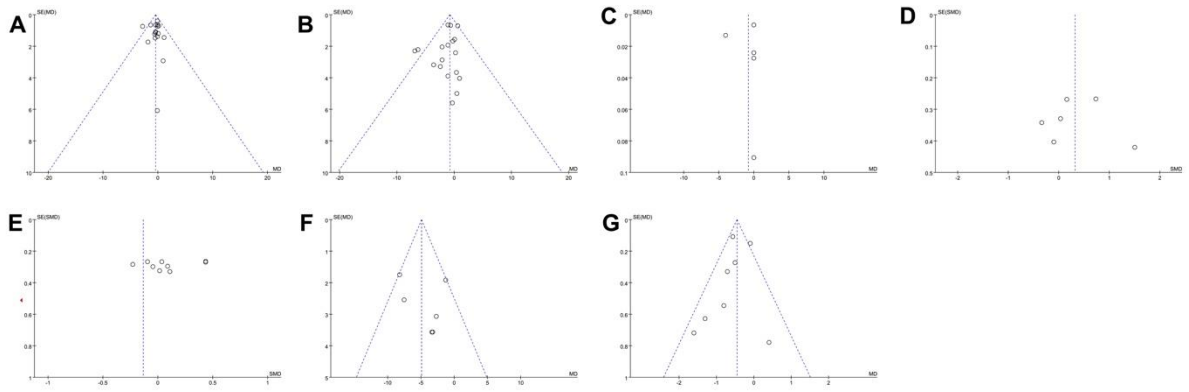


# Supplemental Figure S1

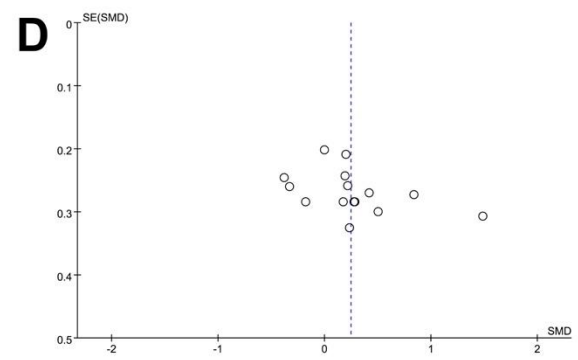
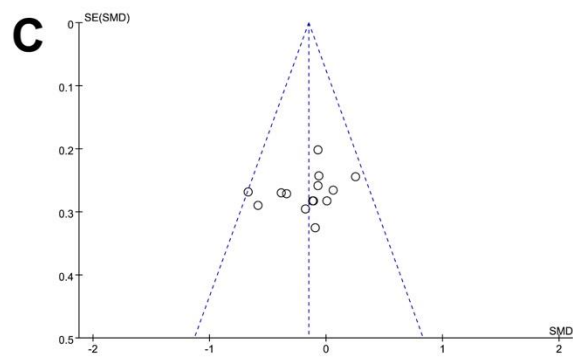
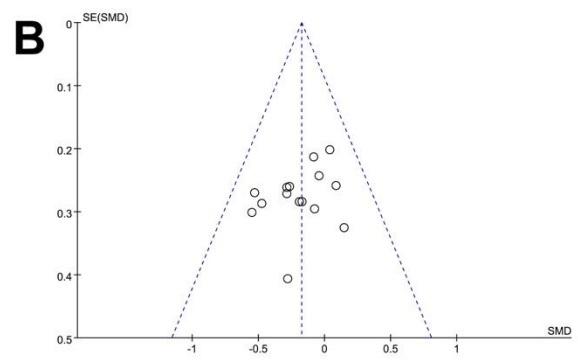
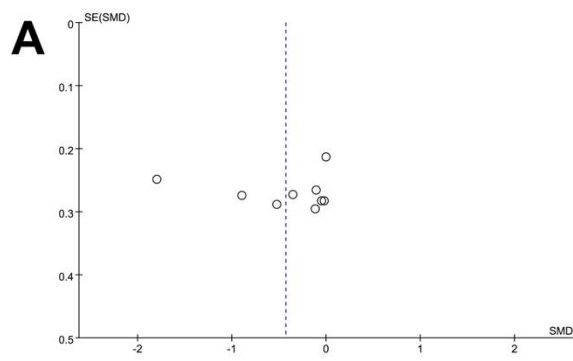


	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Baldrick, F. R 2018	+	+	+	?	-	?	?
Bogdanski, P 2012	-	+	+	?	?	?	?
Cavedon, E., J 2020	-	-	+	+	+	?	?
Dashtabi, A 2016	+	+	+	+	+	?	?
de Souza, R. G. M 2018	+	+	+	+	?	?	?
de Souza, R. G. M 2019	+	+	+	?	?	?	?
Eisner, A 2020	+	-	+	+	?	?	?
Fathi, M 2020	+	+	+	?	?	?	?
Hosseinpour-Arjmand, S 2019	+	-	+	?	?	?	?
Jasbi, P 2019	+	-	+	?	?	?	?
Kamali, S. H 2012	+	-	+	?	?	?	?
Kazemipour, M 2013	+	-	?	?	?	?	?
Khorsandi, H 2019	+	-	?	?	?	?	?
Kirch, N 2018	+	+	+	?	?	?	?
Kojadinovic, M 2021	+	?	?	?	?	?	?
Li, Y 2010	+	-	?	?	?	?	?
Luciana Nicolau Aranha 2020	+	-	+	+	?	?	?
Maria Angelica Arzola-Paniagua 2016	+	?	+	?	?	?	?
Marreiro, D. D 2006	+	-	+	+	?	?	?
Mohammad Alizadeh 2018	+	+	+	+	?	?	?
Most, J 2018	+	+	+	+	?	?	?
Nishimura, M 2019	+	-	+	?	?	?	?
Pawel Bogdanski 2012	+	-	+	+	?	?	?
Payahoo, L 2014	+	-	+	?	?	?	?
Polus, A 2016	?	?	+	+	?	?	?
Roberts, J. D 2021	+	-	+	+	?	?	?
Santamarina, A.B 2020	+	-	+	+	?	?	?
Stull, A. J 2010	+	-	+	+	?	?	?
Suliburska, J 2014	+	-	+	+	?	?	?
Szewczyk-Golec, K 2017	+	+	+	+	?	?	?
Szulinska, M 2017	+	-	+	+	?	?	?
Szulinska, M 2018	+	-	+	+	?	?	?
Taghizadeh, M 2017	+	-	+	+	?	?	?
Williams, E. J 2017	+	-	+	?	?	?	?

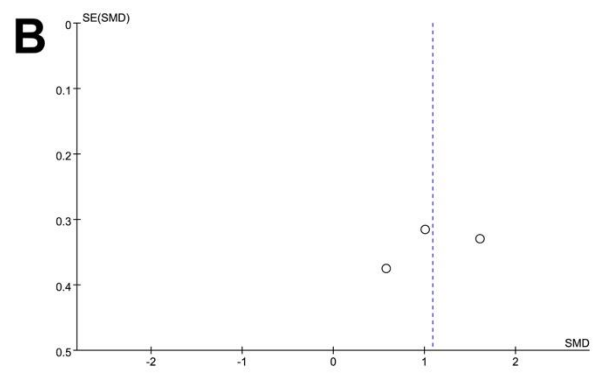
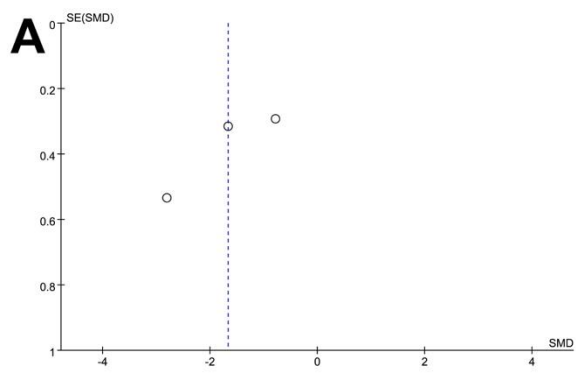
# Supplemental Figure S2



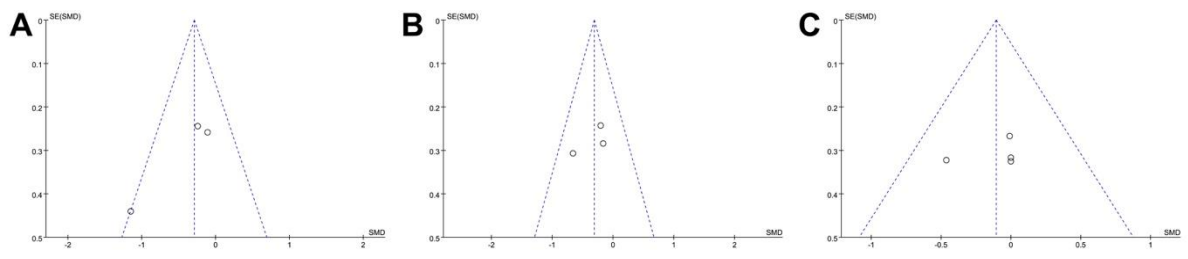
Supplemental Figure S3



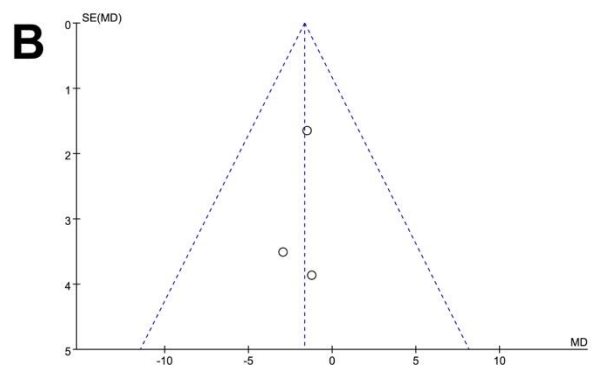
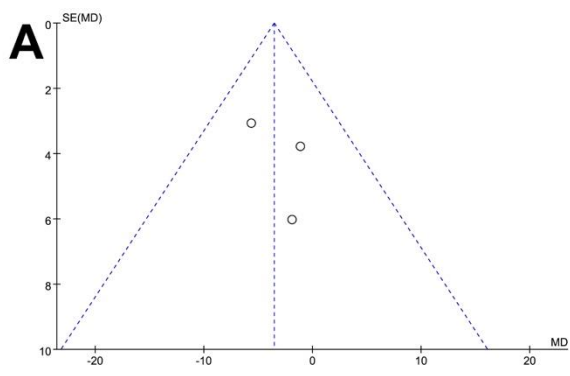
Supplemental Figure S4



# Supplemental Figure S5



Supplemental Figure S6



Supplementary Table S1 Subgroup analysis of the effects of antioxidants on BMI, WC, WHR, Leptin, FM, FBG and HOMA-ir in obesity patients and compared with controls

Subgroup	BMI (kg/m <sup>2</sup> )	WC (cm)	WHR (mmol/L)	Leptin (µg/L)	FM (kg)	FBG (µg/dL)	HOMA-ir
Water-soluble antioxidants	MD=-0.37 95% CI=(-0.83, 0.09), P=0.12	MD=-1.00 95% CI=(-3.58, -1.59) P=0.003	MD=-1.51 95% CI=(-0.63, -0.03) P=0.45	SMD=0.16 95% CI=(-0.32, -0.63) P=0.51	MD=-0.78 95% CI=(-2.36, 0.80) P=0.34	SMD=-5.07 95% CI=(-7.09,-3.05) P<0.00001	MD=-0.46 95% CI=(-0.62, -0.31) P<0.00001
Fat-soluble antioxidants	MD=-0.15 95% CI=(-0.97,-0.68) P=0.72	MD=0.37 95% CI=(-0.89, -1.63) P=0.57	-	MD=0.74 95% CI=(-0.69, 2.18) P=0.03	MD=0.03 95% CI=(-0.41, 0.46) P=0.91	MD=-3.20 95% CI=(-10.19, 3.79) P=0.37	-
Mixed antioxidants	MD=-1.12 95% CI=(-2.27,-0.03) P=0.06	MD=-0.79 95% CI=(-2.04, -0.45) P=0.21	MD=0.01 95% CI=(-0.00, 0.02) P=0.13	-	SMD=0.05 95% CI=(-0.20, -0.30) P=0.67	-	MD=0.40 95% CI=(-1.13, 1.93) P=0.61

Supplementary Table S2 Subgroup analysis of the effects of antioxidants on TC, TG, LDL and HDL in obesity patients and compared with controls group

Subgroup	TC (µg/dL)	TG (µg/dL)	LDL (µg/dL)	HDL (µg/dL)
Water-soluble antioxidants	SMD=-0.16 95%CI=(-0.39, 0.07) P=0.16	SMD=-0.11 95%CI=(-0.26, 0.05) P=0.17	SMD=-0.13 95%CI=(-0.29, 0.04) P=0.13	SMD=0.17 95%CI=(-0.13, -0.47) P=0.26
Fat-soluble antioxidants	SMD=-0.11 95%CI=(-0.63, 0.41) P=0.69	SMD=-0.53 95%CI=(-1.05, 0.00) P=0.05	MD=0.06 95%CI=(-0.46, 0.58) P=0.82	-
Mixed antioxidants	SMD=-0.94 95%CI=(-1.89, 0.01) P=0.05	SMD=-0.19 95%CI=(-0.48, 0.09) P=0.18	SMD=-0.28 95%CI=(-0.57, 0.00) P=0.05	SMD=0.39 95%CI=(0.16, 0.63) P=0.001



Supplementary Table S3 Subgroup analysis of the effects of antioxidants on MDA and SOD in obesity patients and compared with controls group

Subgroup	MDA (mmol/L)	SOD (mmol/L)
Water-soluble antioxidants	MD=-1.21 95% CI=(-2.08, -0.34) P=0.007	MD=1.61 95% CI=(0.96, 2.25) P<0.00001
Fat-soluble antioxidants	MD=-2.80 95% CI=(-3.84, -1.76) P<0.00001	MD=0.58, 95% CI=(-0.15, 1.32) P=0.12
Mixed antioxidants	-	MD=1.01 95% CI=(0.39, 1.63) P=0.001

Supplementary Table S4 Subgroup analysis of the effects of antioxidants on TNF- $\alpha$ , IL-6 and CRP in obesity patients and compared with controls group

Subgroup	TNF- $\alpha$ (pg/mL)	IL-6 (pg/mL)	CRP (mg/L)
Water-soluble antioxidants	MD=-0.29 95% CI=(-0.56, -0.02) P=0.03	MD=-0.19 95% CI=(-0.55, 0.18) P=0.31	MD=-0.19 95% CI=(-0.60, 0.21) P=0.35
Fat-soluble antioxidants	-	SMD=-0.66, 95% CI=(-1.26, -0.06) P=0.03	MD=0.00, 95% CI=(-0.62, 0.62) P=1.00
Mixed antioxidants	-	-	MD=0.00 95% CI=(-0.64, 0.64) P=1.00

Supplementary Table S5 Subgroup analysis of the effects of antioxidants on ALT and AST in obesity patients and compared with controls group

Subgroup	ALT (U/L)	AST (U/L)
Water-soluble antioxidants	MD=-1.31 95% CI=(-4.11, 1.49) P=0.36	MD=-0.32 95% CI=(-2.13, 1.48) P=0.73
Fat-soluble antioxidants	MD=-1.90 95% CI=(-13.70, 9.90) P=0.75	MD=-2.90 95% CI=(-9.77, -3.97) P=0.41
Mixed antioxidants	-	MD=-1.20 95% CI=(-8.78, 6.38) P=0.76