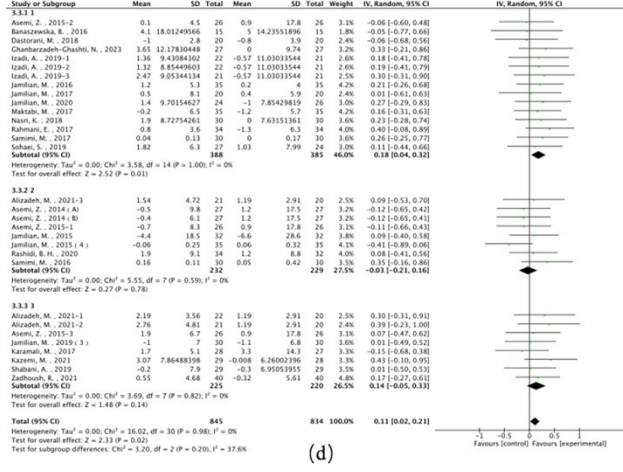
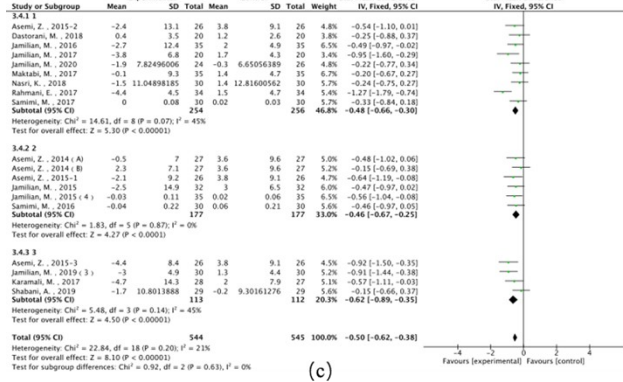
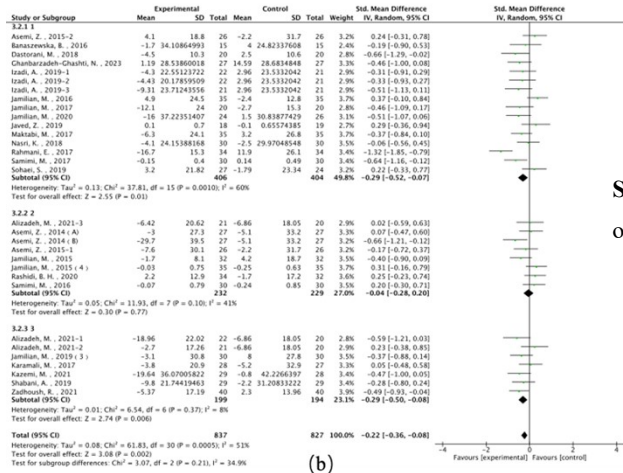
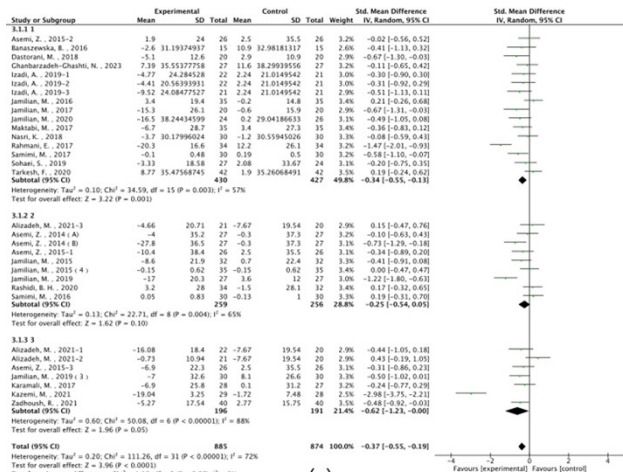


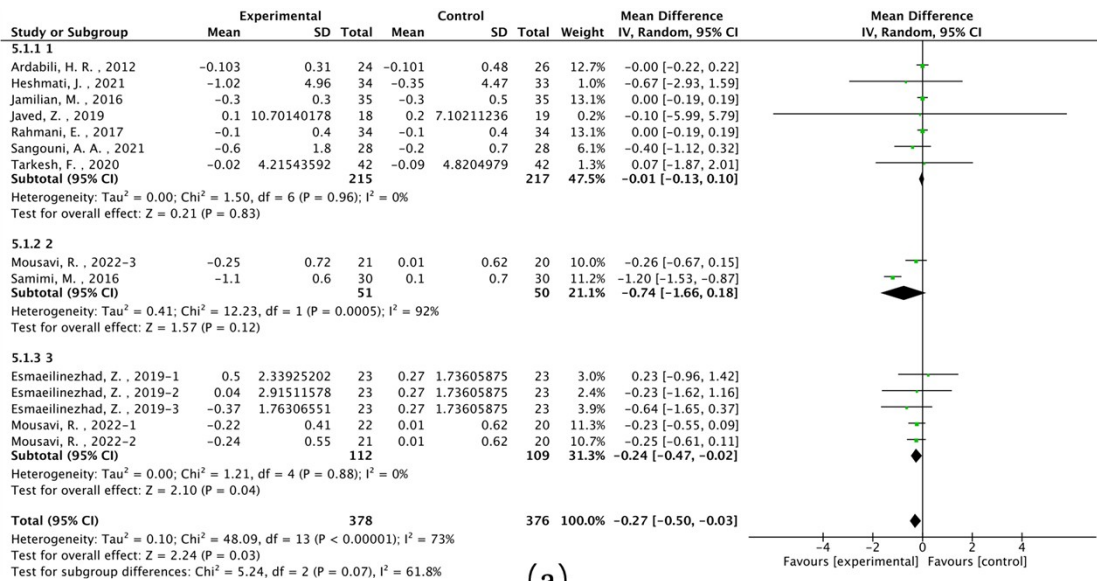
Supplementary statement S1: Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

	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
Afshar Ebrahimi, F. . 2018	?	?	?	?	?	?	?
Al-Bayyari, N. . 2020	?	?	?	?	?	?	?
Alizadeh, M. . 2021-1	?	?	?	?	?	?	?
Alizadeh, M. . 2021-2	?	?	?	?	?	?	?
Alizadeh, M. . 2021-3	?	?	?	?	?	?	?
Ardabili, H. R. . 2012	?	?	?	?	?	?	?
Asemi, Z. . 2014 (A)	?	?	?	?	?	?	?
Asemi, Z. . 2014 (B)	?	?	?	?	?	?	?
Asemi, Z. . 2015-1	?	?	?	?	?	?	?
Asemi, Z. . 2015-2	?	?	?	?	?	?	?
Asemi, Z. . 2015-3	?	?	?	?	?	?	?
Banaszewska, B. . 2016	?	?	?	?	?	?	?
Dastorani, M. . 2018	?	?	?	?	?	?	?
Ebrahimi, F. A. . 2016	?	?	?	?	?	?	?
Esmailnezhad, Z. . 2019-1	?	?	?	?	?	?	?
Esmailnezhad, Z. . 2019-2	?	?	?	?	?	?	?
Esmailnezhad, Z. . 2019-3	?	?	?	?	?	?	?
Chanbarzadeh-Ghashti, N. . 2023	?	?	?	?	?	?	?
Heshmati, J. . 2021	?	?	?	?	?	?	?
Izadi, A. . 2018-1	?	?	?	?	?	?	?
Izadi, A. . 2018-2	?	?	?	?	?	?	?
Izadi, A. . 2018-3	?	?	?	?	?	?	?
Izadi, A. . 2019-1	?	?	?	?	?	?	?
Izadi, A. . 2019-2	?	?	?	?	?	?	?
Izadi, A. . 2019-3	?	?	?	?	?	?	?
Jamilian, H. . 2017	?	?	?	?	?	?	?
Jamilian, M. . 2015	?	?	?	?	?	?	?
Jamilian, M. . 2015 (2)	?	?	?	?	?	?	?
Jamilian, M. . 2015 (3)	?	?	?	?	?	?	?
Jamilian, M. . 2015 (4)	?	?	?	?	?	?	?
Jamilian, M. . 2016	?	?	?	?	?	?	?
Jamilian, M. . 2017	?	?	?	?	?	?	?
Jamilian, M. . 2018	?	?	?	?	?	?	?
Jamilian, M. . 2019	?	?	?	?	?	?	?
Jamilian, M. . 2019 (2)	?	?	?	?	?	?	?
Jamilian, M. . 2019 (3)	?	?	?	?	?	?	?
Jamilian, M. . 2020	?	?	?	?	?	?	?
Javed, Z. . 2019	?	?	?	?	?	?	?
Karamali, M. . 2017	?	?	?	?	?	?	?
Kazemi, M. . 2021	?	?	?	?	?	?	?
Lerchbaum, E. . 2021	?	?	?	?	?	?	?
Maktabi, M. . 2017	?	?	?	?	?	?	?
Maktabi, M. . 2017 (2)	?	?	?	?	?	?	?
Mohammad Hosseinzadeh, F. . 2015	?	?	?	?	?	?	?
Mousavi, R. . 2022-1	?	?	?	?	?	?	?
Mousavi, R. . 2022-2	?	?	?	?	?	?	?
Mousavi, R. . 2022-3	?	?	?	?	?	?	?
Nasri, K. . 2018	?	?	?	?	?	?	?
Rahmani, E. . 2017	?	?	?	?	?	?	?
Rashidi, B. H. . 2020	?	?	?	?	?	?	?
Razavi, M. . 2015	?	?	?	?	?	?	?
Razavi, M. . 2016	?	?	?	?	?	?	?
Samimi, M. . 2016	?	?	?	?	?	?	?
Samimi, M. . 2017	?	?	?	?	?	?	?
Sangouni, A. A. . 2021	?	?	?	?	?	?	?
Seyyed Abootorabi, M. . 2018	?	?	?	?	?	?	?
Shabani, A. . 2019	?	?	?	?	?	?	?
Shokrpoor, M. 2019	?	?	?	?	?	?	?
Sohaei, S. . 2019	?	?	?	?	?	?	?
Taghizadeh, S. . 2021	?	?	?	?	?	?	?
Tarkesh, F. . 2020	?	?	?	?	?	?	?
Zadhoush, R. . 2021	?	?	?	?	?	?	?

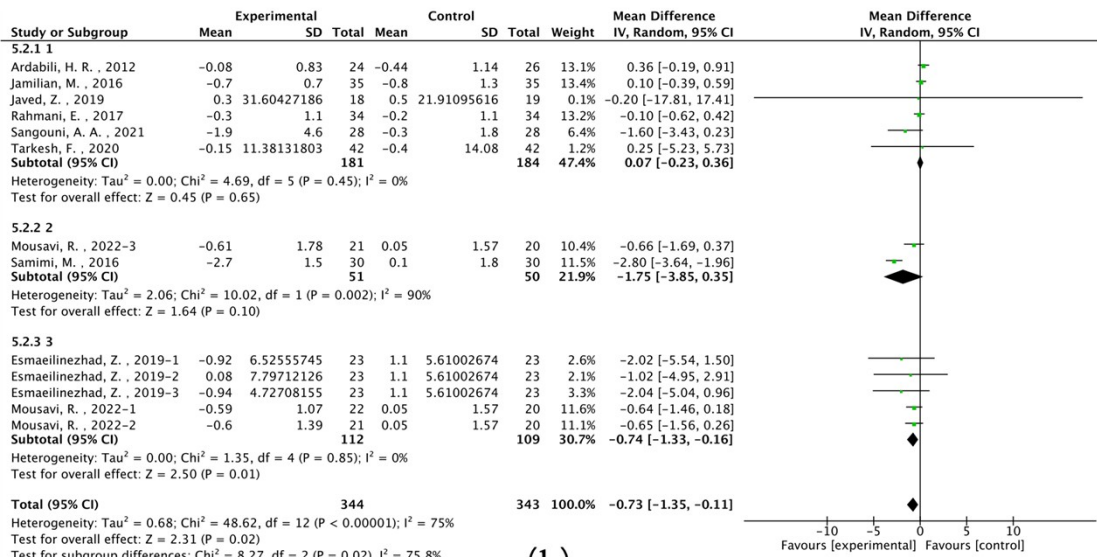
Supplementary statement S2: Risk of bias summary: review authors' judgements about each risk of bias item for each included study.



Supplementary statement S2: Lipid metabolism in subgroup analyses of forest plot: TC(a), LDL-C(b), VLDL(c), HDL-C(d),

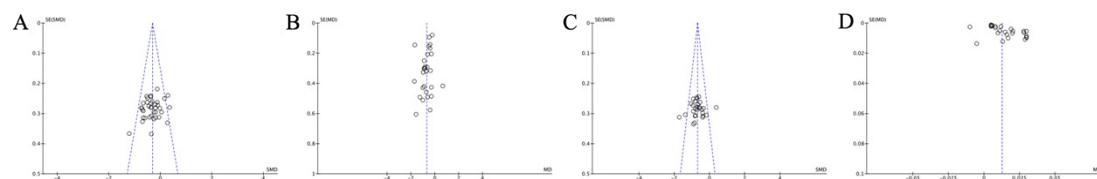


(a)

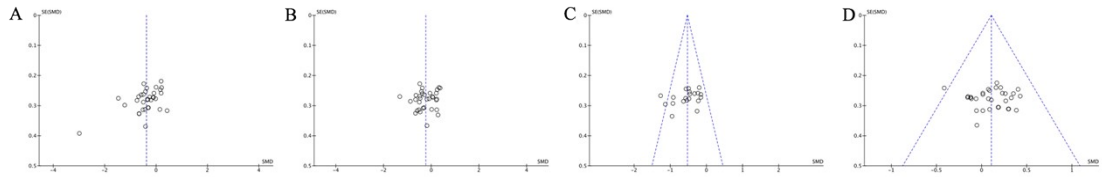


(b)

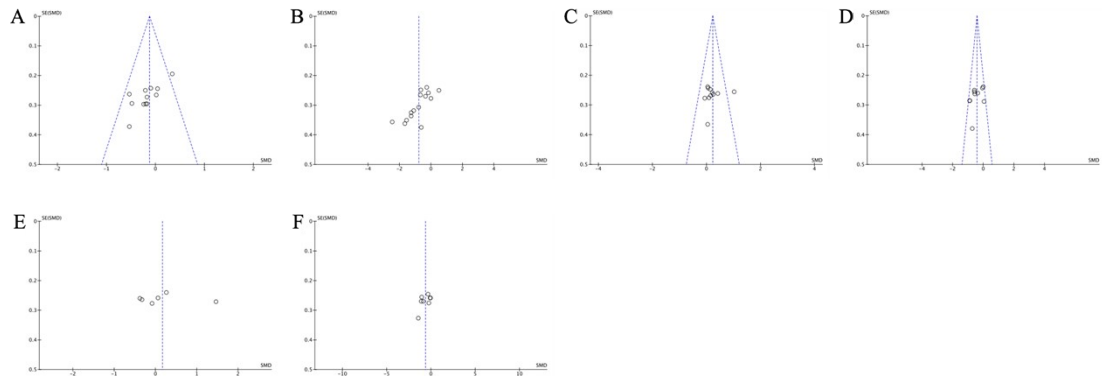
Supplementary statement S2: basic index in subgroup analyses of forest plot: BMI(a),Weight(c).



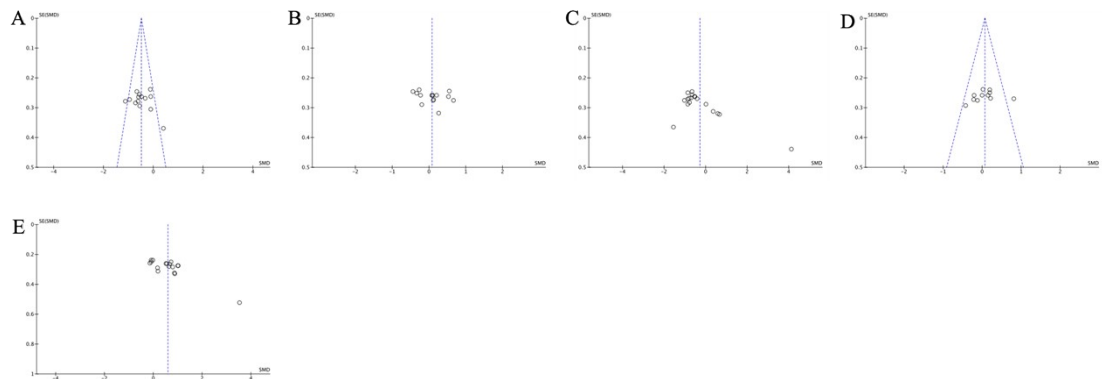
Supplementary statement S3: funnel plot evaluating study bias for the effects of antioxidants on glucometabolic indexes: FPG (A), HOMA-IR (B), Insulin (C), and QUICKI (D) in PCOS patients and compared with the control group.



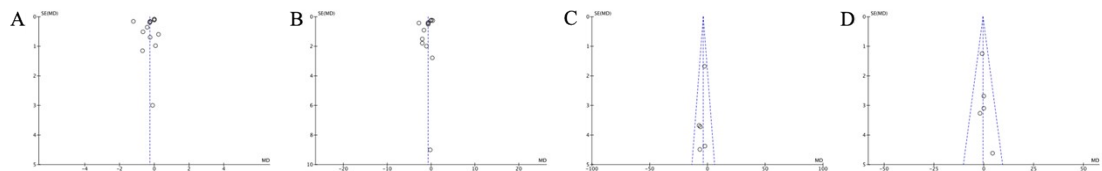
Supplementary statement S3: funnel plot evaluating study bias for the effects of antioxidants on lipid metabolism indexes: TC (A), LDL-R (B), VLDL (C), and HDL-C (D) in PCOS patients and compared with the control group.



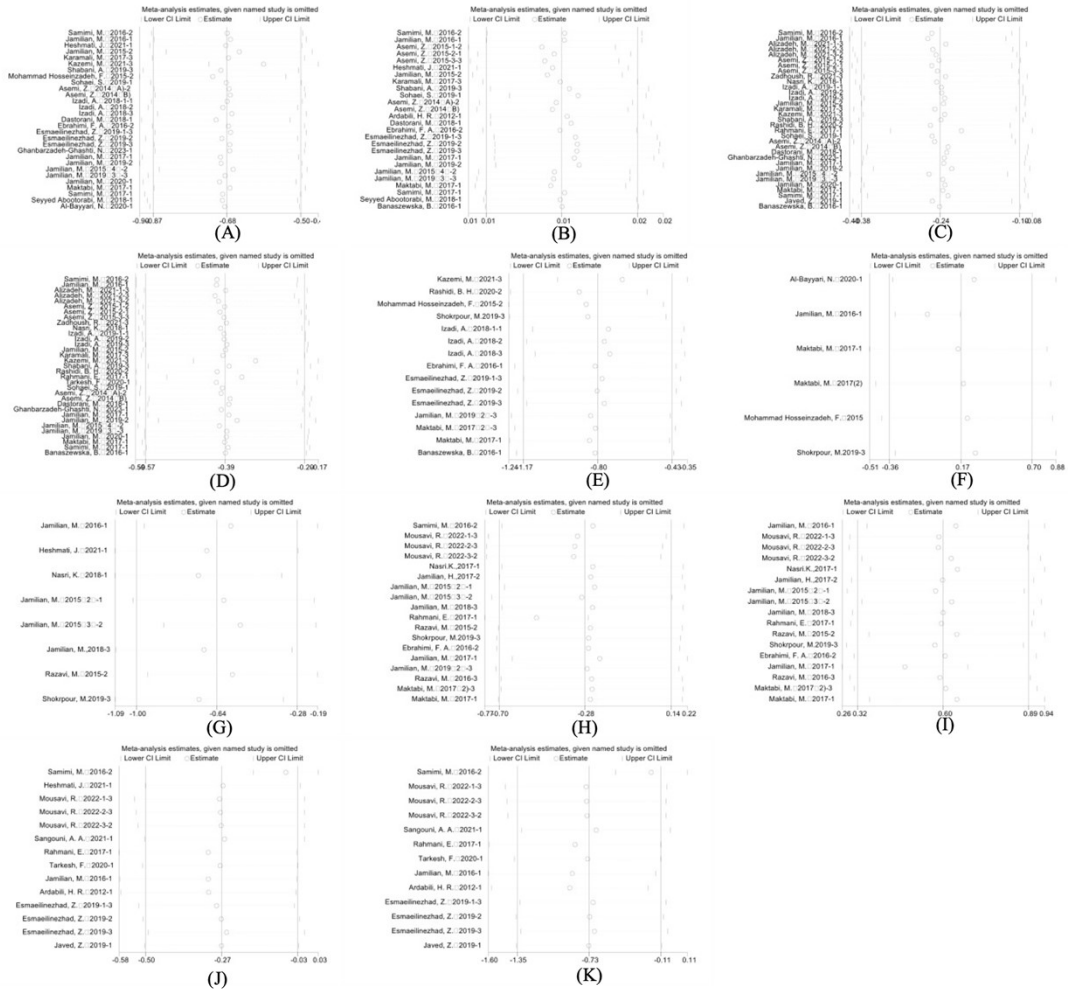
Supplementary statement S3: funnel plot evaluating study bias for the effects of antioxidants on lipid metabolism indexes: FSH (A), TT (B), SHBG (C), DHEAs (D), FAI(E) and M F-G SCORES (F) in PCOS patients and compared with the control group.



Supplementary statement S3: funnel plot evaluating study bias for the effects of antioxidants on lipid metabolism indexes: CRP (A), GSH (B), MDA (C), NO(D), and TAC (E) in PCOS patients and compared with the control group.



Supplementary statement S3: funnel plot evaluating study bias for the effects of antioxidants on lipid metabolism indexes: BMI (A), Weight (B), SBP (C), and DBP(D) in PCOS patients and compared with the control group.



Supplementary statement S4: Sensitivity analysis of highly heterogeneous outcome measures: HOMA-IR(A), QUICK (B), LDL-C (C), TC(D), Total testosterone(E), FAI (F), m F-G SCORES (G), MDA(H), TAC(I), BMI(J), Weight (K)