

Supplementary Materials

Does vitamin D supplementation modulate metabolic risk factors of cardiovascular disease? A systematic review and meta-analysis of clinical trials

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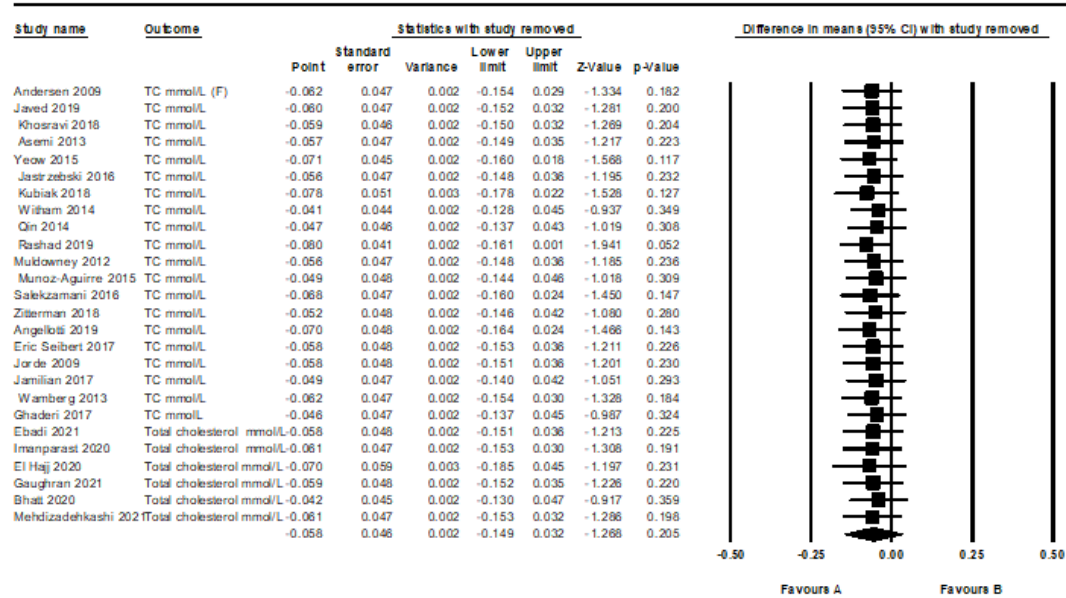
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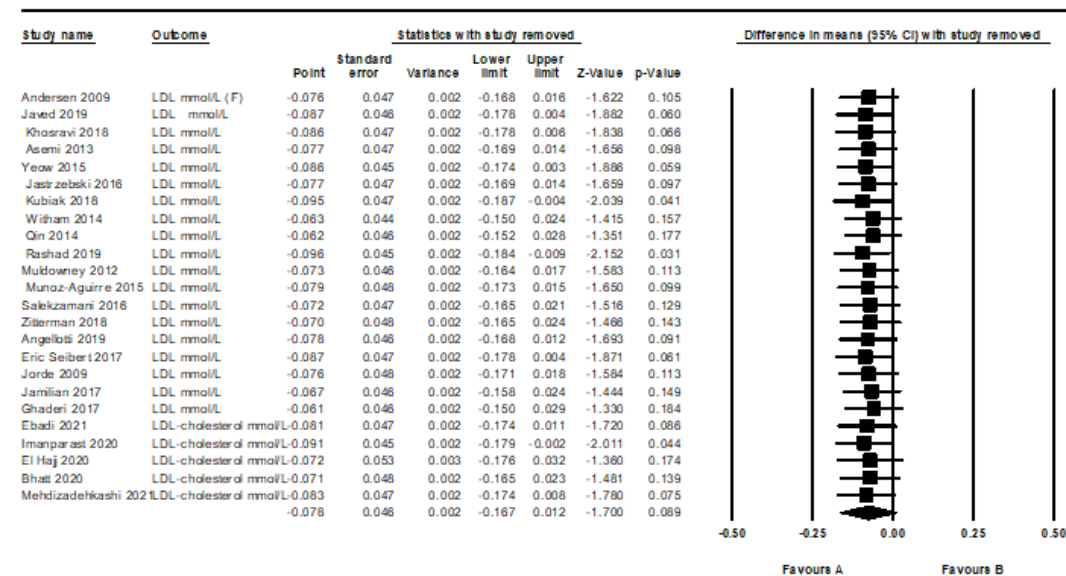
doi: 10.6133/apjcn.202608_35(4).0007

(A) Total cholesterol



Meta Analysis

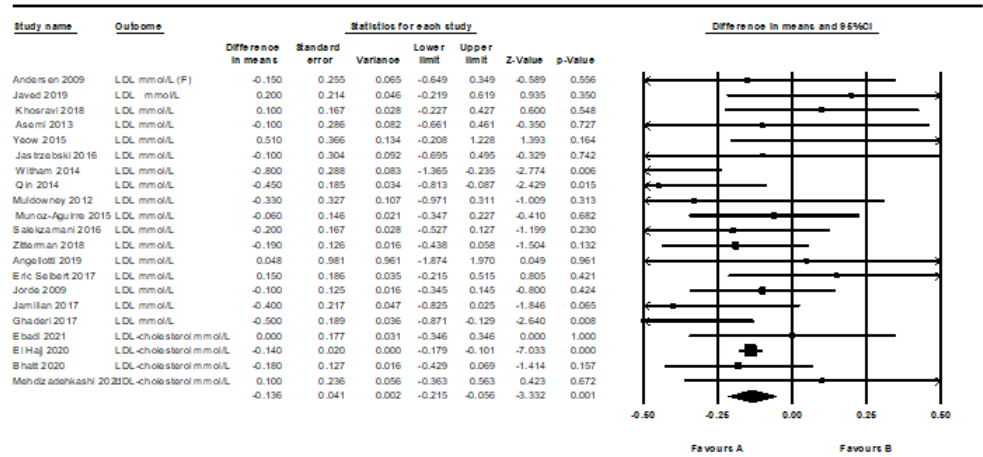
(B) LDL-cholesterol



Meta Analysis

Supplementary Figure 1. Forest plots of leave-one-out sensitivity analyses evaluating the effect of vitamin D supplementation on: (A) total cholesterol, (B) LDL-cholesterol, (C) LDL-cholesterol after exclusion of three influential studies (Kubiak et al.; Rashad et al.; Imanparast et al.), (D) HDL-cholesterol, (E) triglycerides, (F) systolic blood pressure, and (G) diastolic blood pressure.

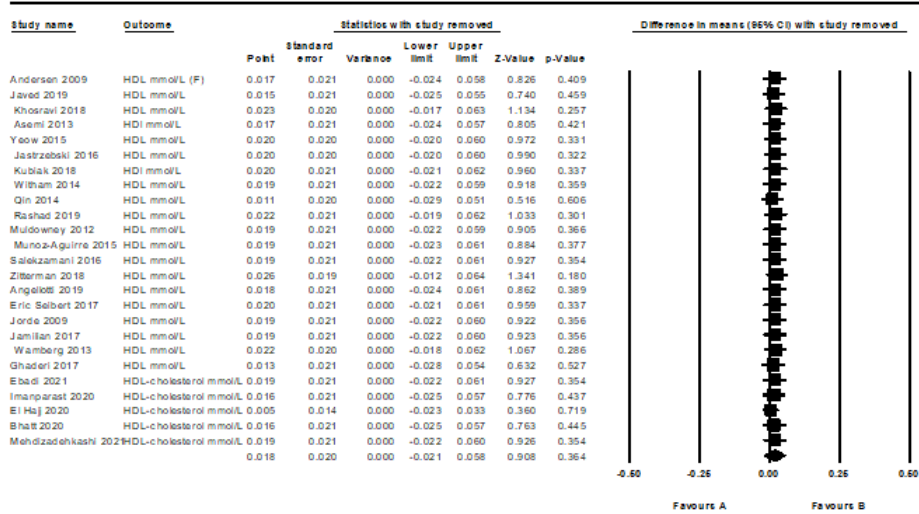
(C) LDL-cholesterol after exclusion of three influential studies (Kubiak et al.; Rashad et al.; Imanparast et al.).



Meta Analysis

Model	Effect size and 95% confidence interval						Test of null (2-Tail)		Heterogeneity			
Model	Number Studies	Point estimate	Standard error	Variance	Lower limit	Upper limit	Z-value	P-value	Q-value	df (Q)	P-value	I-squared
Fixed	21	-0.139	0.018	0.000	-0.174	-0.104	-7.709	0.000	26.114	20	0.162	23.413
Random	21	-0.136	0.041	0.002	-0.215	-0.056	-3.332	0.001				

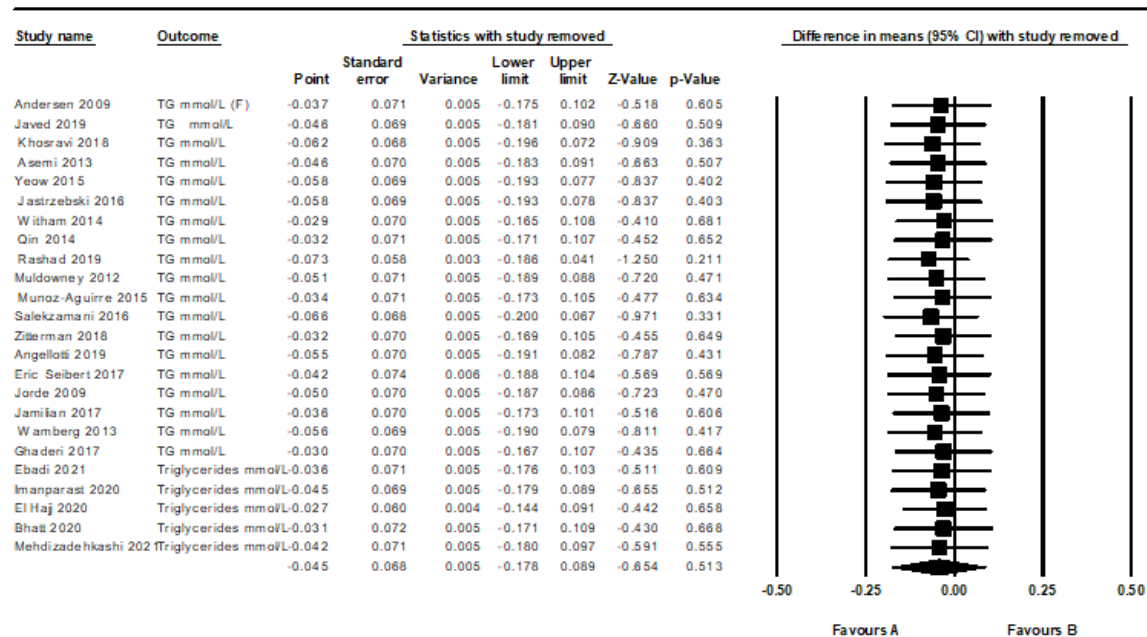
(D) HDL-cholesterol



Meta Analysis

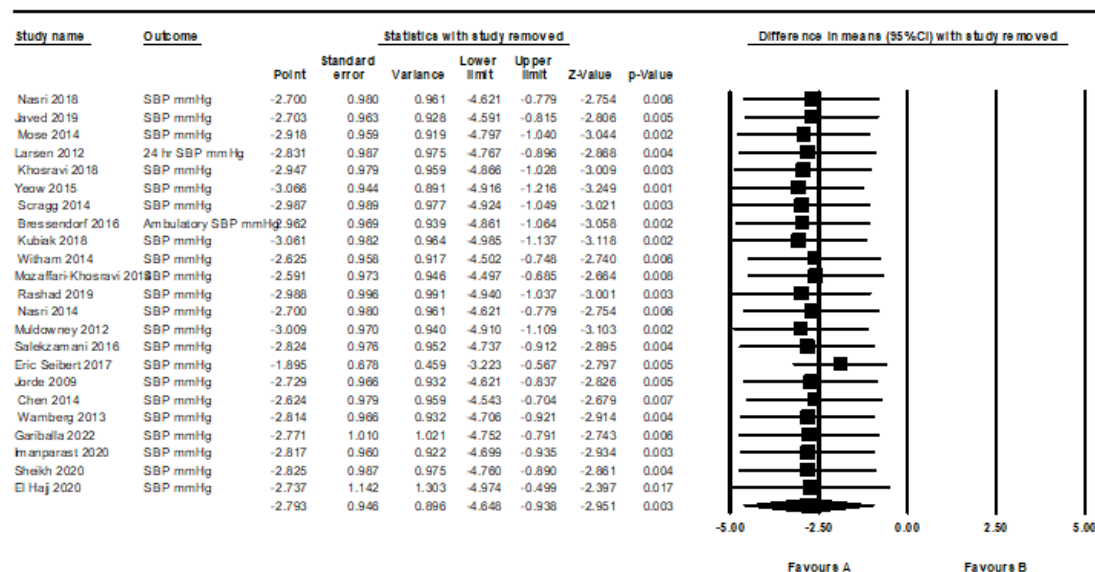
Supplementary Figure 1. (cont.) Forest plots of leave-one-out sensitivity analyses evaluating the effect of vitamin D supplementation on: (A) total cholesterol, (B) LDL-cholesterol, (C) LDL-cholesterol after exclusion of three influential studies (Kubiak et al.; Rashad et al.; Imanparast et al.), (D) HDL-cholesterol, (E) triglycerides, (F) systolic blood pressure, and (G) diastolic blood pressure.

(E) Triglycerides



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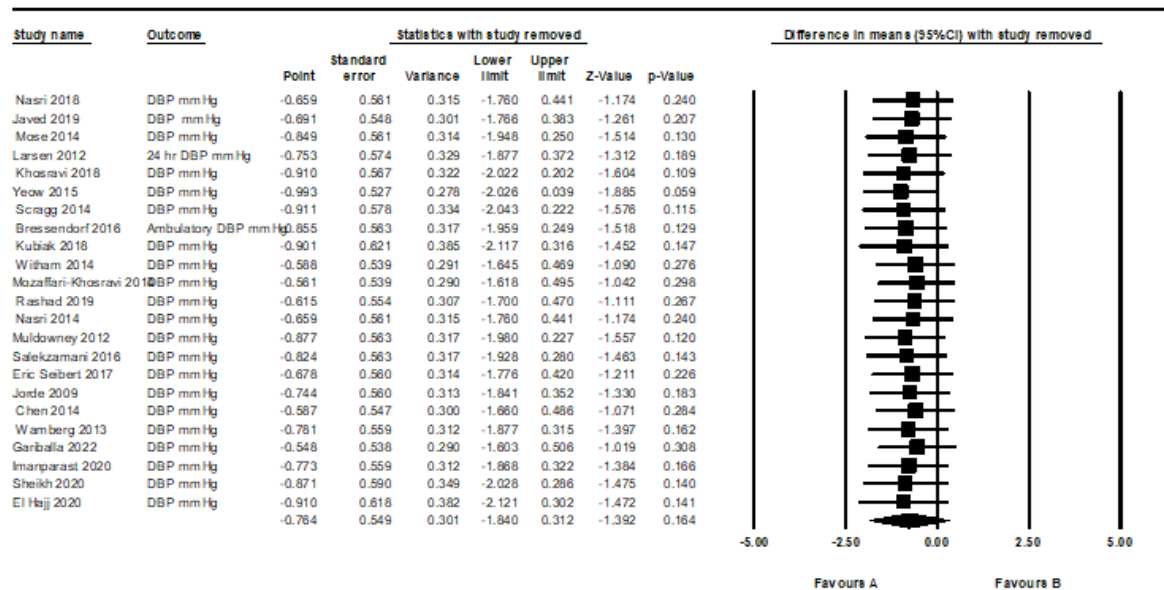
(F) Systolic blood pressure



Meta Analysis is

Supplementary Figure 1. (cont.) Forest plots of leave-one-out sensitivity analyses evaluating the effect of vitamin D supplementation on: (A) total cholesterol, (B) LDL-cholesterol, (C) LDL-cholesterol after exclusion of three influential studies (Kubiak et al.; Rashad et al.; Imanparast et al.), (D) HDL-cholesterol, (E) triglycerides, (F) systolic blood pressure, and (G) diastolic blood pressure.

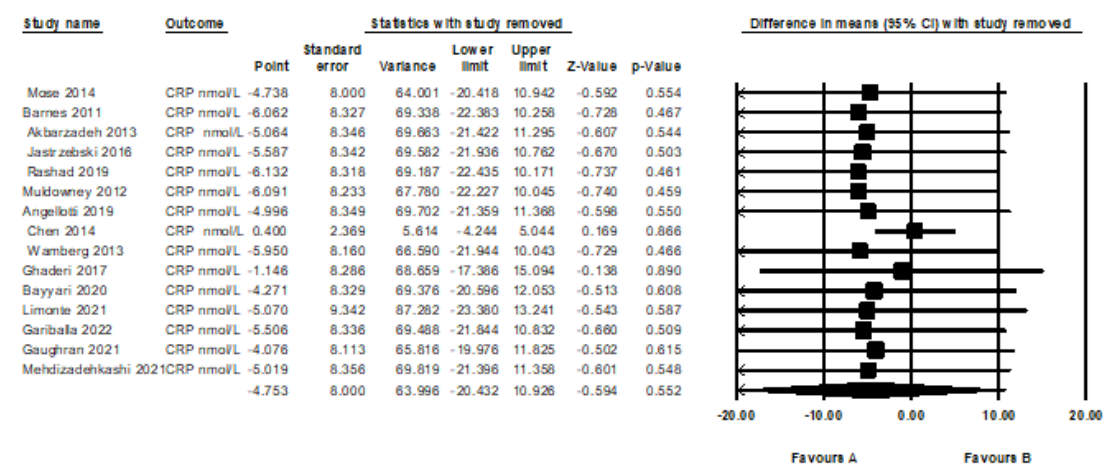
(G) Diastolic blood pressure



Meta Analysis

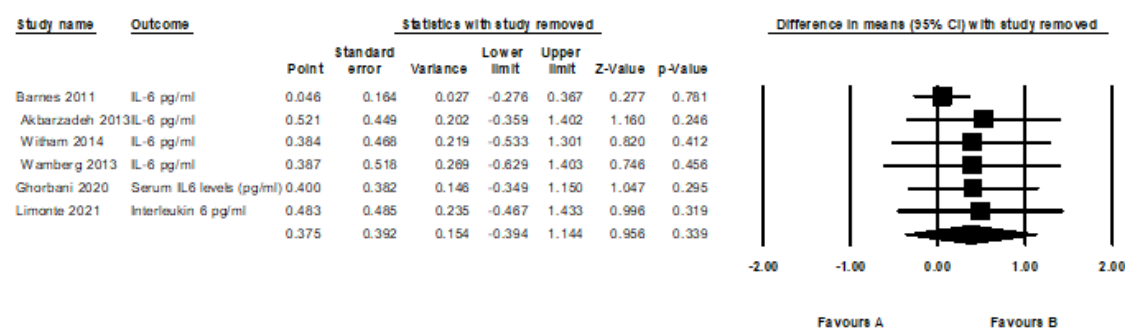
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(A) C-reactive protein



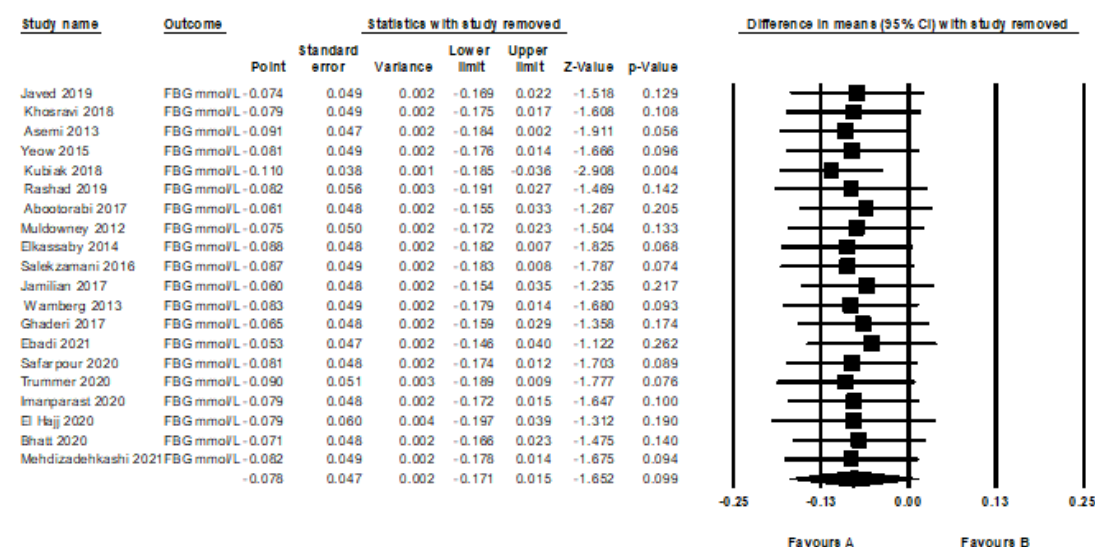
Meta Analysis

(B) Interleukin 6



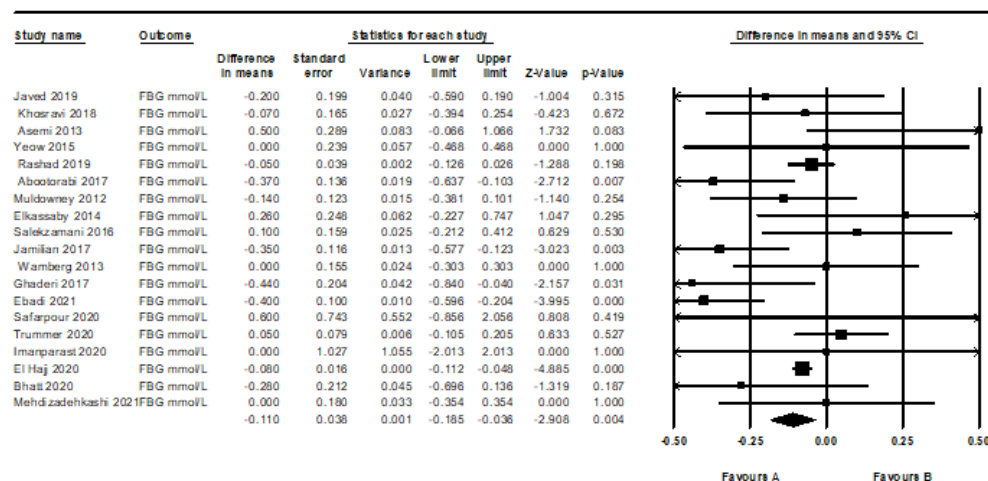
Meta Analysis

(C) Fasting blood glucose



Supplementary Figure 2. Forest plots of leave-one-out sensitivity analyses evaluating the effect of vitamin D supplementation on: (A) C-reactive protein, (B) interleukin-6, (C) fasting blood glucose, (D) fasting blood glucose after exclusion of the influential study by Kubiak et al., (E) hemoglobin A1c, (F) hemoglobin A1c after exclusion of the influential study by Kubiak et al., and (G) body mass index

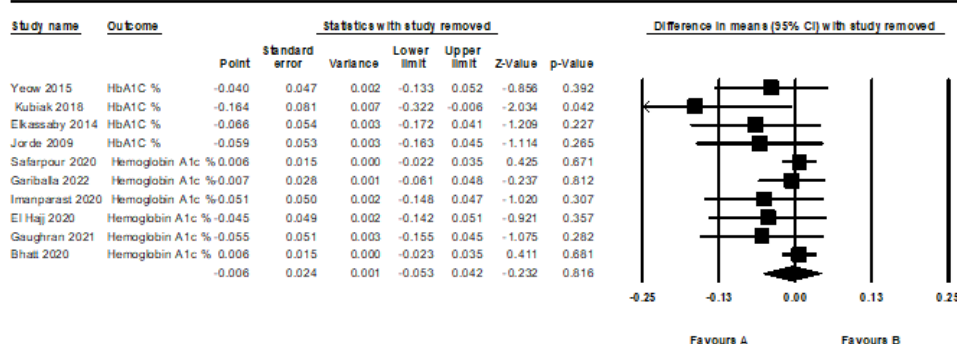
(D) Fasting blood glucose after exclusion of the influential study by Kubiak et al.



Meta Analysis

Model	Effect size and 95% confidence interval						Test of null (2-Tail)		Heterogeneity			
Model	Number Studies	Point estimate	Standard error	Variance	Lower limit	Upper limit	Z-value	P-value	Q-value	df (Q)	P-value	I-squared
Fixed	19	-0.084	0.014	0.000	-0.111	-0.056	-5.980	0.000	36.631	18	0.006	50.861
Random	19	-0.110	0.038	0.001	-0.185	-0.036	-2.908	0.004				

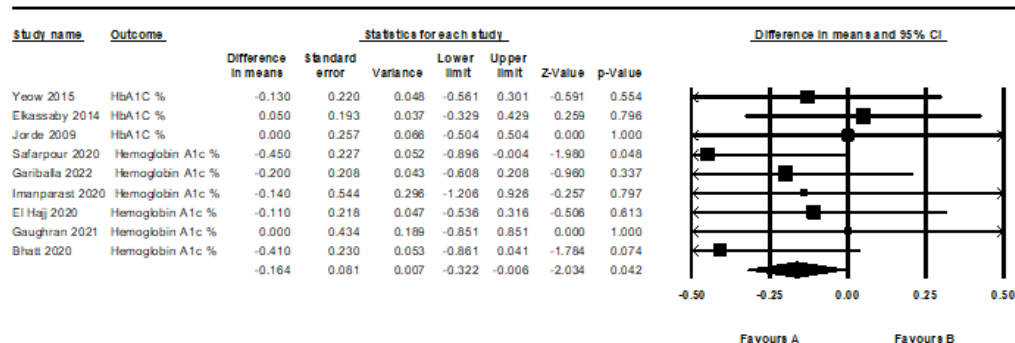
(E) Hemoglobin A1c



Meta Analysis

Supplementary Figure 2. (cont.) Forest plots of leave-one-out sensitivity analyses evaluating the effect of vitamin D supplementation on: (A) C-reactive protein, (B) interleukin-6, (C) fasting blood glucose, (D) fasting blood glucose after exclusion of the influential study by Kubiak et al, (E) hemoglobin A1c, (F) hemoglobin A1c after exclusion of the influential study by Kubiak et al. , and (G) body mass index

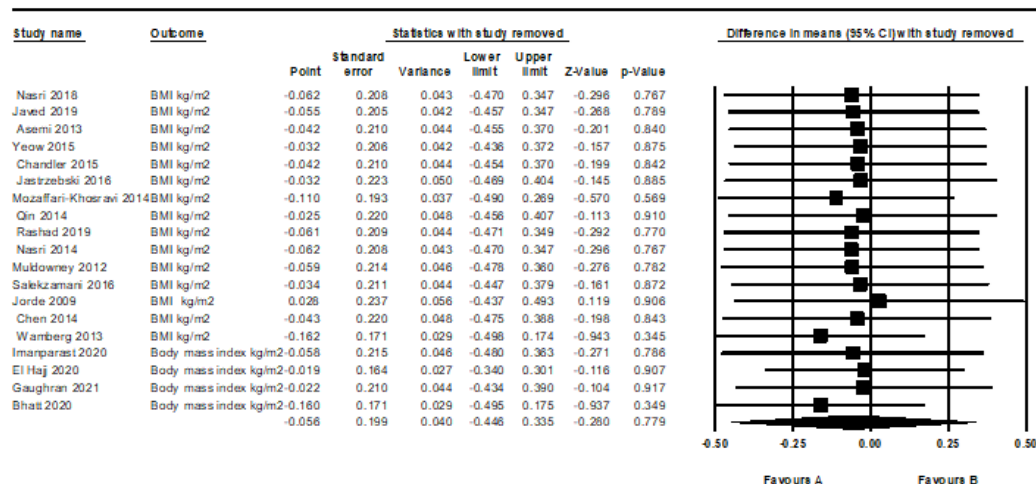
(F) Hemoglobin A1c after exclusion of the influential study by Kubiak et al.



Meta Analysis

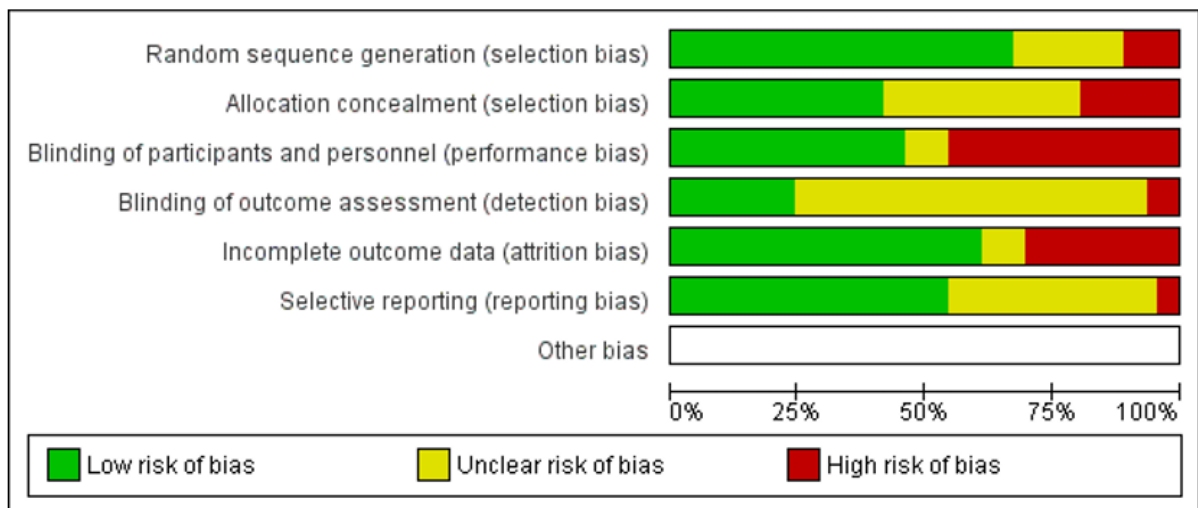
Model	Effect size and 95% confidence interval						Test of null (2-Tail)		Heterogeneity			
Model	Number Studies	Point estimate	Standard error	Variance	Lower limit	Upper limit	Z-value	P-value	Q-value	df (Q)	P-value	I-squared
Fixed	9	-0.164	0.081	0.007	-0.322	-0.006	-2.034	0.042	4.622	8	0.797	0.000
Random	9	-0.164	0.081	0.007	-0.322	-0.006	-2.034	0.042				

(G) Body mass index



Meta Analysis

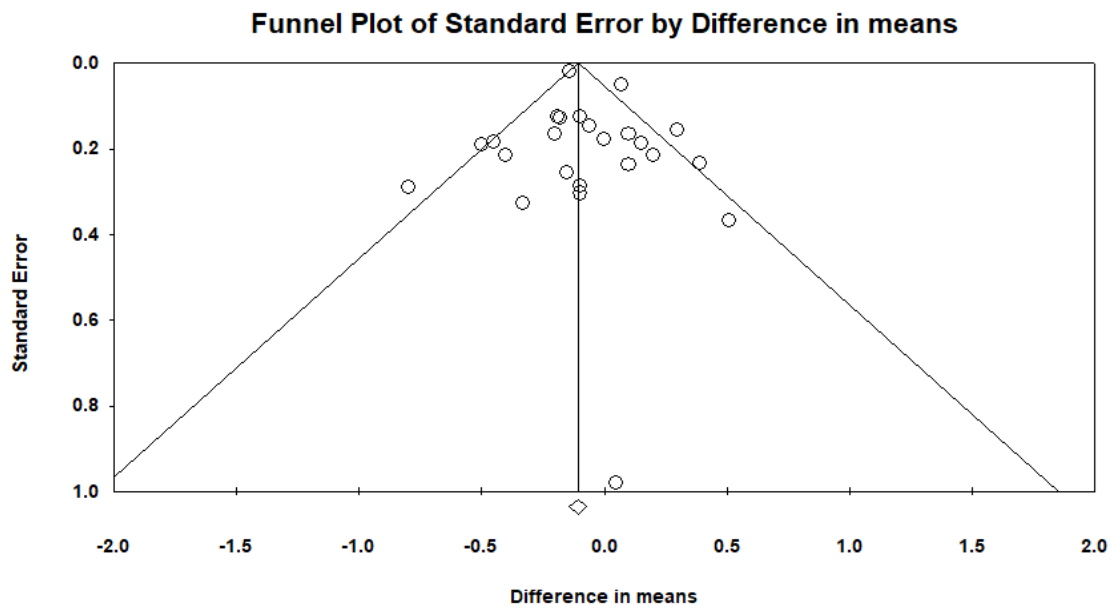
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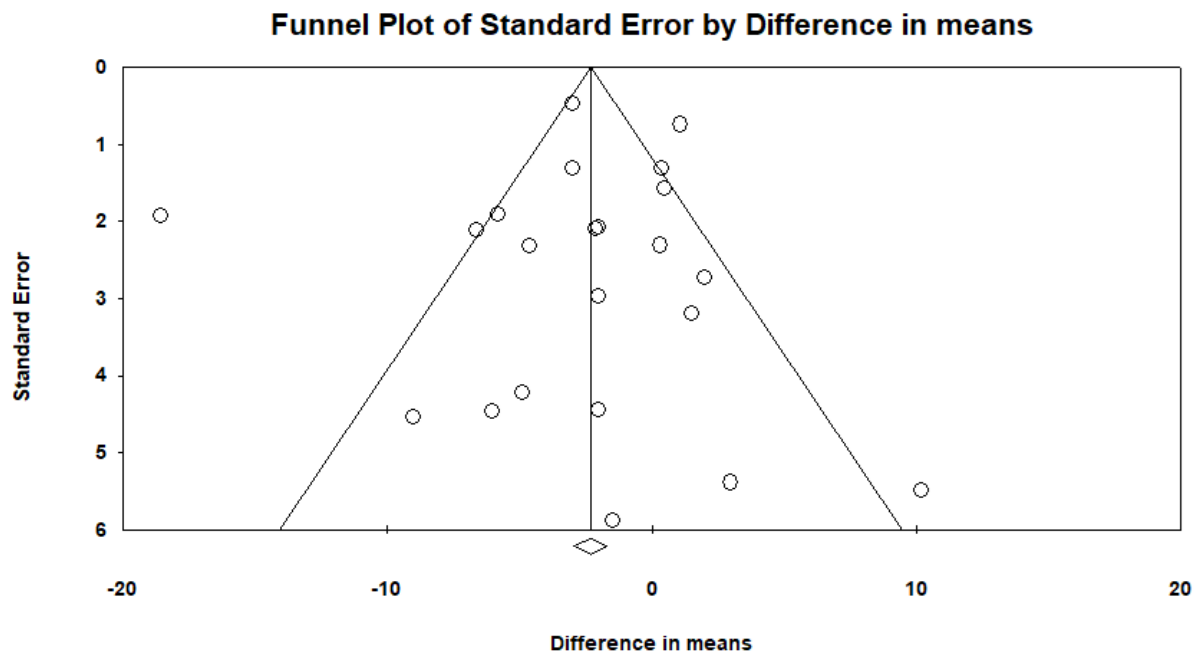
Supplementary Figure 3. Risk of bias graph showing review authors' judgments about each risk of bias item, presented as percentages across all included studies

	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
Akbarzadeh 2013	+	+	+	?	+	+	
Andersen 2009	?	?	+	?	+	?	
Angellotti 2019	+	+	+	?	+	+	
Barnes 2012	+	+	+	?	+	?	
Bayyari 2021	+	+	+	+	+	+	
Bhatt 2020	+	+	+	+	+	?	
Bressendorf 2016	?	+	+	?	?	?	
Chandler 2015	+	+	+	?	+	?	
Chen 2014	+	+	+	?	+	?	
Ebadi 2021	+	+	+	+	+	+	
El Hajj 2020	+	+	?	?	+	?	
Elkassaby 2014	+	+	+	?	+	?	
Gariballa 2022	+	?	+	+	+	?	
Gaughran 2021	+	+	+	+	+	?	
Ghaderi 2017	+	?	?	?	+	?	
Ghorbani 2020	?	?	?	?	?	+	
Grübler 2020	+	+	+	+	?	+	
Imanparast 2020	+	+	+	+	+	?	
Jamilian 2017	+	+	+	+	+	+	
Javed 2019	+	?	+	?	+	+	
Jorde 2009	?	?	+	?	?	+	
Jorde 2010	+	+	+	?	+	+	
Karamali 2017	?	?	+	+	+	+	
Khosravi 2018	+	?	+	?	+	?	
Kubiak 2018	+	?	+	?	+	+	
Larsen 2012	?	+	+	?	+	+	
Limonte 2021	+	?	+	+	+	+	
Mose 2014	+	?	+	?	+	+	
Mozaffari-khozravi 2014	+	+	?	?	+	+	
Muldowney 2012	+	?	+	?	+	+	
Munoz-Aguirre 2015	+	+	+	?	+	+	
Nasri 2018	+	?	+	?	+	+	
Qin 2014	+	+	+	?	+	+	
Rashad 2019	+	+	+	?	+	+	
Safarpour 2020	+	?	+	+	+	+	
Salekzamani 2016	+	+	+	?	+	?	
Scragg 2014	+	?	+	?	+	?	
Scragg 2017	?	?	+	?	+	+	
Seibert 2017	+	?	+	?	+	+	
Seyyed Abootorabi 2017	+	?	+	?	+	?	
Sheikh 2020	?	+	+	+	+	+	
Wamberg 2013	+	+	+	?	+	+	
Witham 2013	?	+	+	+	+	?	
Witham 2014	+	+	+	+	+	?	
Yeow 2015	+	+	+	?	+	+	
Zitterman 2019	?	+	+	?	+	?	

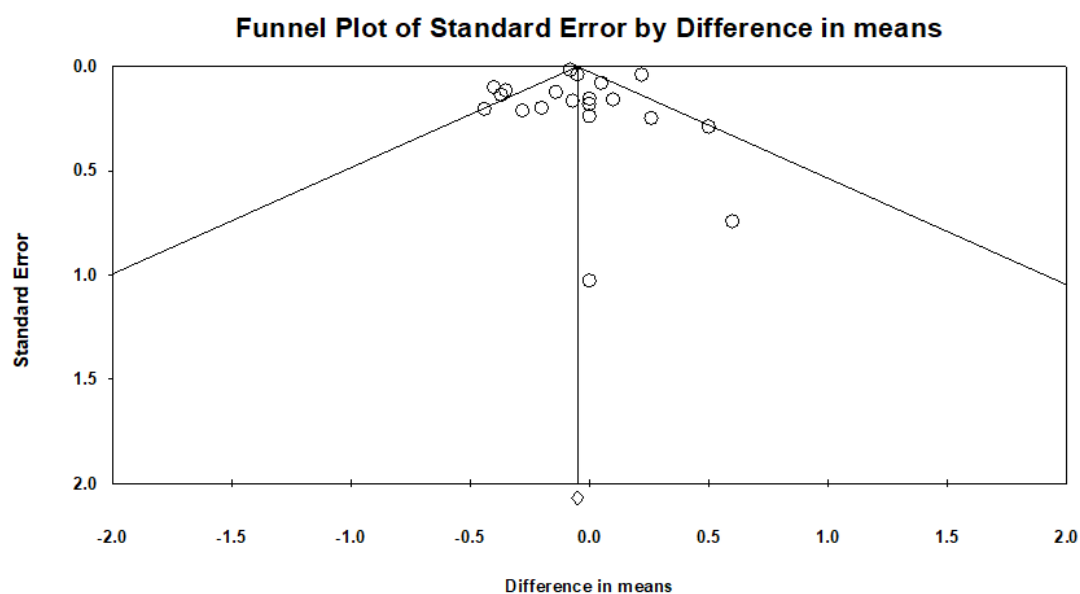
Supplementary Figure 4. Risk of bias summary presenting review authors' judgment of each risk of bias item for each included study



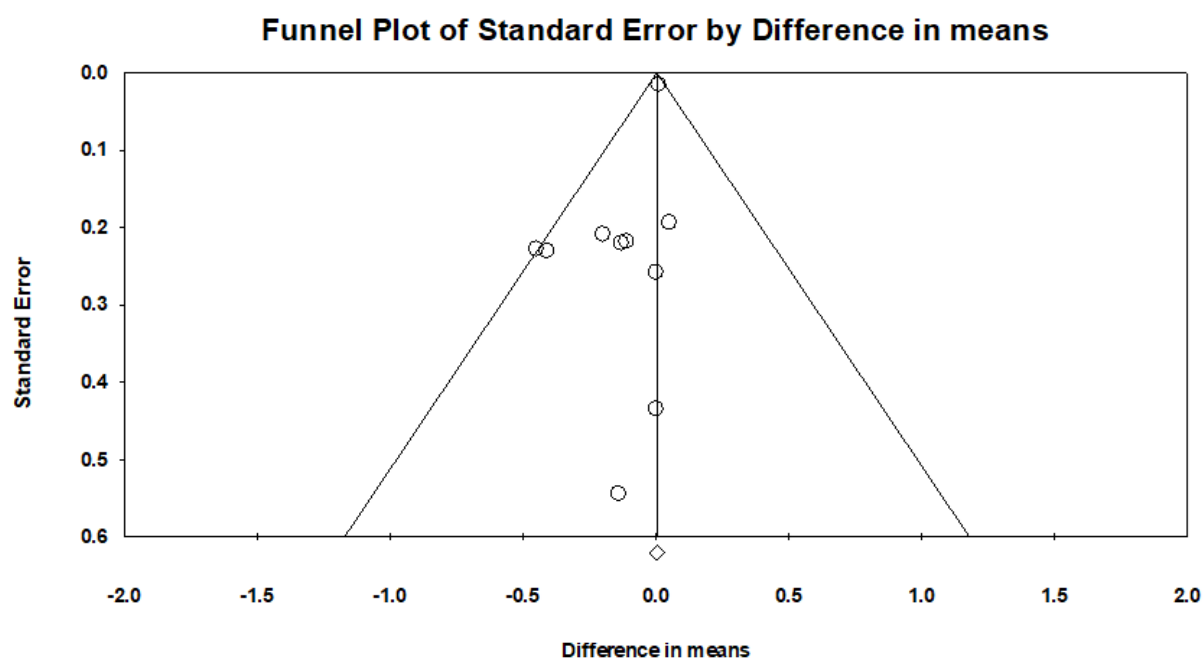
Supplementary Figure 5. Funnel plot of standard error versus difference in means for LDL cholesterol concentrations



Supplementary Figure 6. Funnel plot of standard error versus difference in means for systolic blood pressure



Supplementary Figure 7. Funnel plot of standard error versus difference in means for fasting blood glucose



Supplementary Figure 8. Funnel plot of standard error versus difference in means for hemoglobin A1c