

# Impact of Prolonged Sitting interruption on Blood Glucose, Insulin and Triacylglycerol in Adults: A Systematic Review and Meta-analysis

## Supplementary File S1

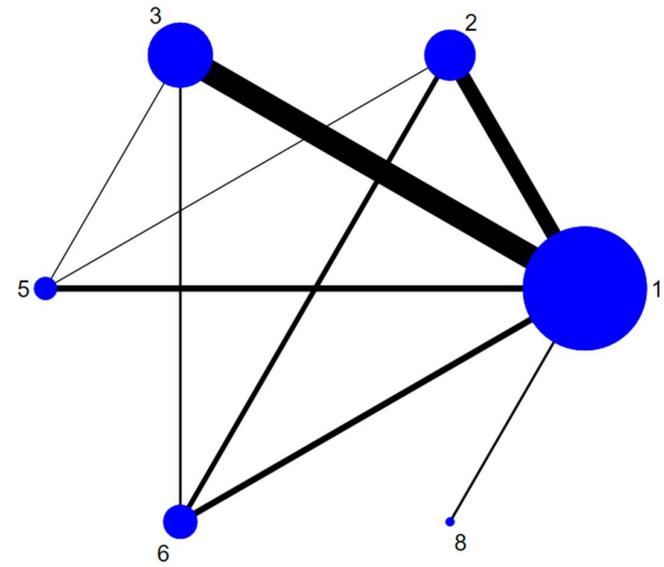
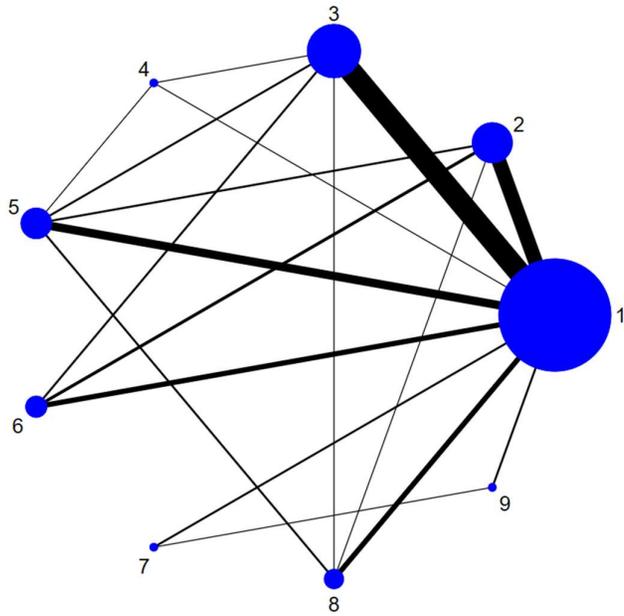
### Contents

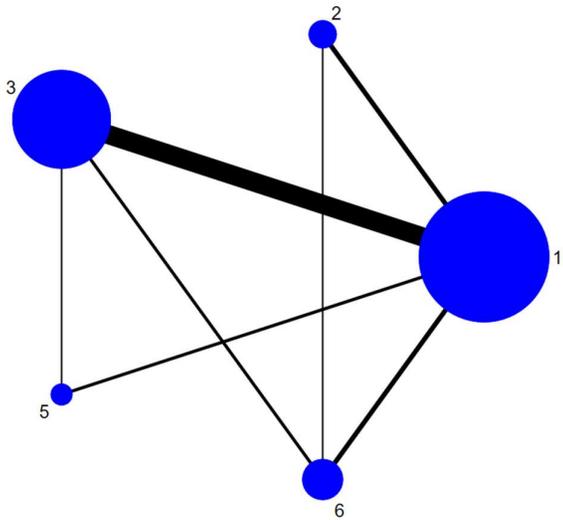
Table S1 Search strategy.....	2
Figure S1 Network plots for comparisons of different interventions on glucose, insulin, and triacylglycerol. ....	3
Figure S2 Forest plots of network meta-analyses for glucose and insulin compared with prolonged sitting. ....	5
Figure S3 Local inconsistency test results for glucose, insulin and triacylglycerol responses.....	8
Table S2 The ranking of interventions for glucose and insulin in the network meta-analysis.....	9
Figure S4 Funnel plots for each outcome in the network meta-analysis for glucose, insulin and triacylglycerol.....	10
Table S3 The risk of bias assessment of included studies.....	13

**Table S1 Search strategy**

Database	Search strategy	Results
PubMed	(((sitting[Title/Abstract] OR seden*[Title/Abstract])) AND ((exercise[Title/Abstract] OR "physical activity"[Title/Abstract]))) AND ((glucose[Title/Abstract] OR insulin[Title/Abstract] OR glyce*mi*[Title/Abstract] OR metabolic*[Title/Abstract] OR triglyceride[Title/Abstract] OR triacylglycerol[Title/Abstract])) Restricted to Randomized Controlled Trail	677
Web of Science	#1 ABSTRACT: (exercise OR "physical activity") #2 ABSTRACT: (sitting OR seden*) #3 ABSTRACT: (randomiz* OR break* OR interrupt*) #4 ABSTRACT: (glucose OR insulin OR glyce*mi* OR metabolic* OR triglyceride OR triacylglycerol) #5 #4 AND #3 AND #2 AND #1 Restricted to Clinical Trail	436
Scopus	( TITLE-ABS-KEY ( ( sitting OR seden* ) ) AND TITLE-ABS-KEY ( ( exercise OR "physical activity" ) ) AND TITLE-ABS-KEY ( randomiz* ) AND TITLE-ABS-KEY ( ( glucose OR insulin OR glyce*mi* OR metabolic* OR triglyceride OR triacylglycerol ) ) ) AND PUBYEAR < 2023 AND ( LIMIT-TO ( LANGUAGE , "English" ) )	959
Cochrane Library	(sitting OR seden*) AND (exercise OR "physical activity") AND (randomiz*) AND (glucose OR insulin OR glyce*mi* OR metabolic* OR triglyceride* OR triacylglycerol) in Title Abstract Keyword - with Publication Year to 2022, in Trials	Embase 826 CINAHL 32

Figure S1 Network plots for comparisons of different interventions on glucose, insulin, and triacylglycerol.

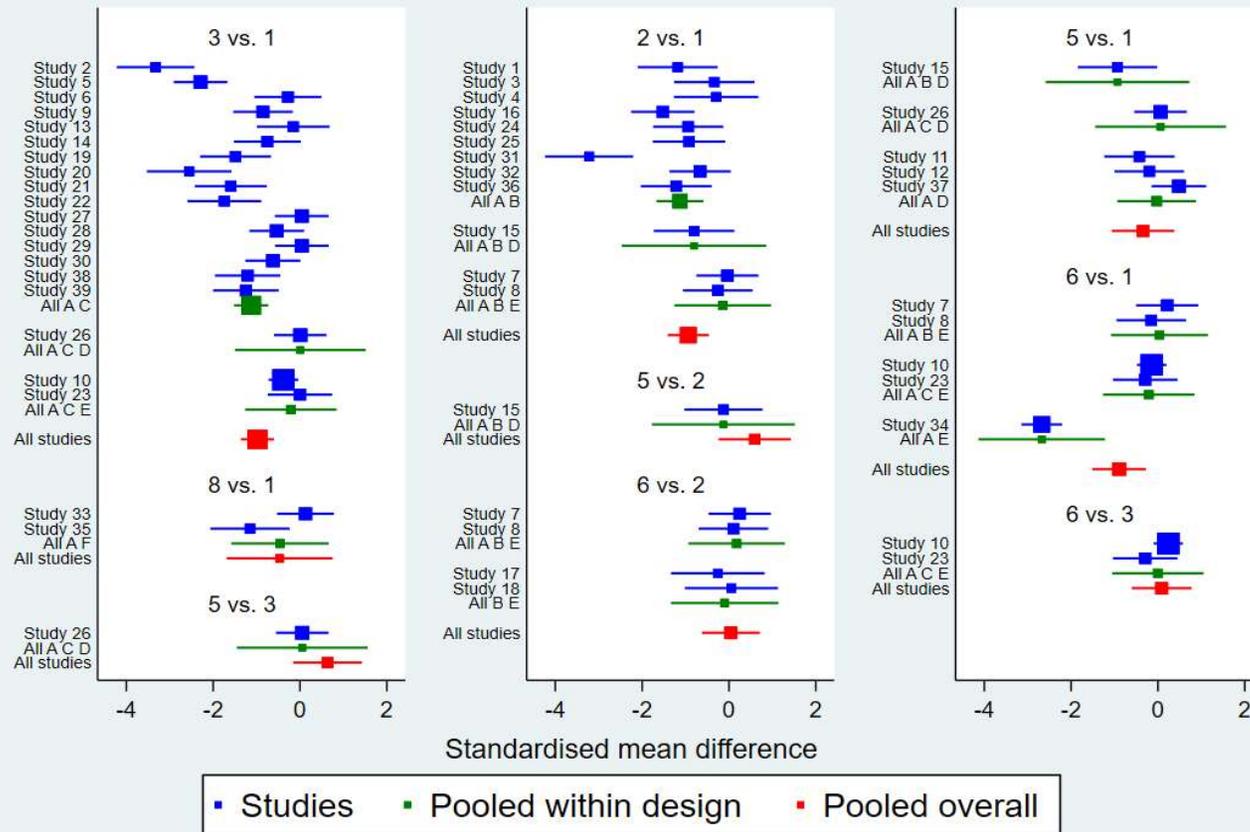




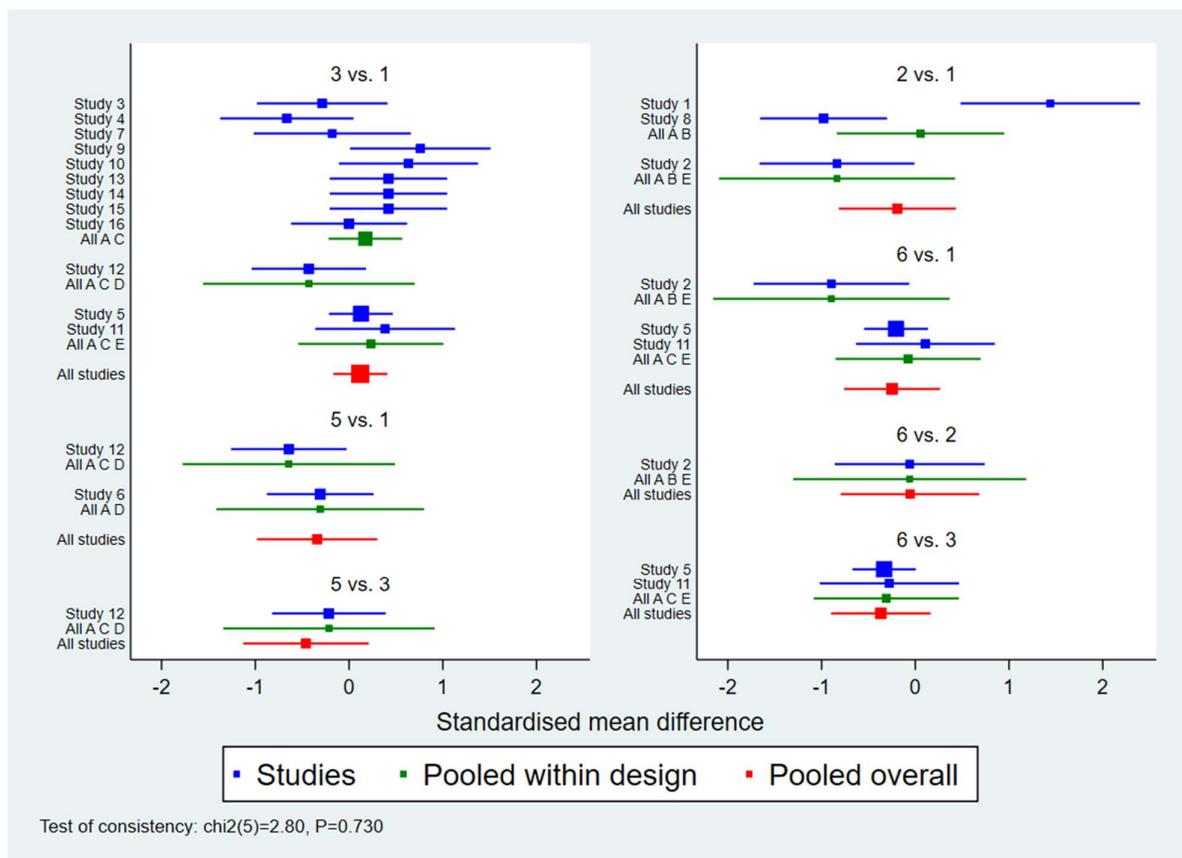
Network plots for comparisons of outcomes. Comparisons of different interrupting prolonged sitting interventions on glucose (upper left portion), insulin (upper right portion), and triacylglycerol (lower left portion).

- 1) Prolonged sitting
- 2) Every 20-min interruption
- 3) Every 30-min interruption
- 4) Every 45-min interruption
- 5) Every 60-min interruption
- 6) A single 30-min exercise bout
- 7) A single 45-min exercise bout
- 8) A single 60-min exercise bout
- 9) Three 15-min bouts after meals





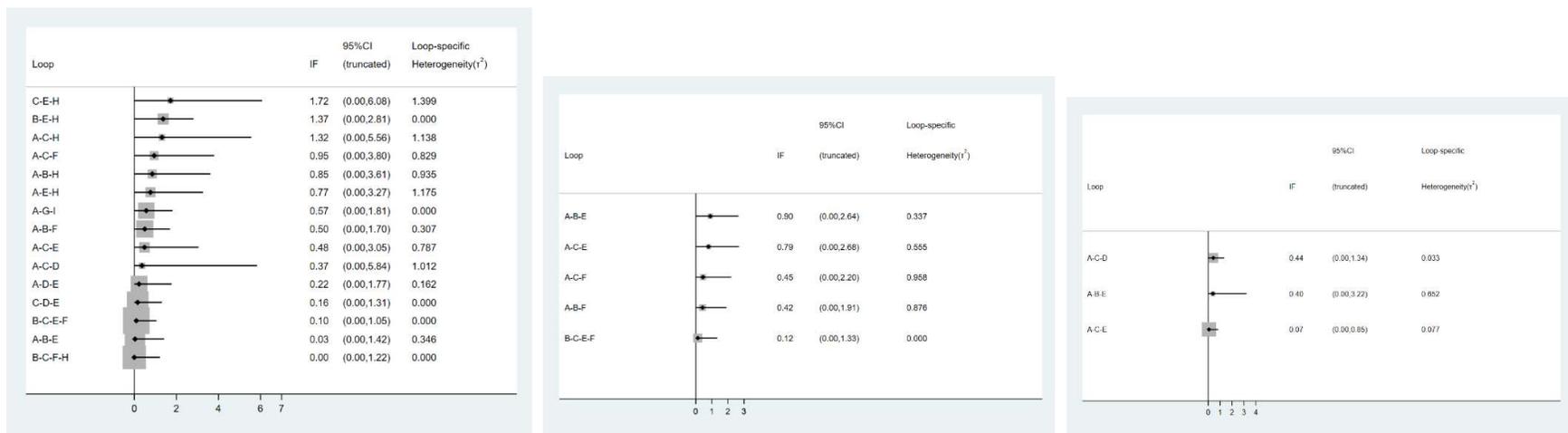
Test of consistency:  $\chi^2(9)=15.34, P=0.082$



Forest plots of network meta-analyses for glucose (first), insulin (second) and triacylglycerol (third) compared with prolonged sitting. A = (reference), prolonged sitting; B = Every 20-min interruption; C = Every 30-min interruption; D = Every 45-min interruption; E = Every 60-min interruption; F = a single 30-min exercise bout; G = a

single 45-min exercise bout; H = a single 60-min exercise bout; I = three 15-min bouts after meals.

**Figure S3 Local inconsistency test results for glucose, insulin and triacylglycerol responses.**

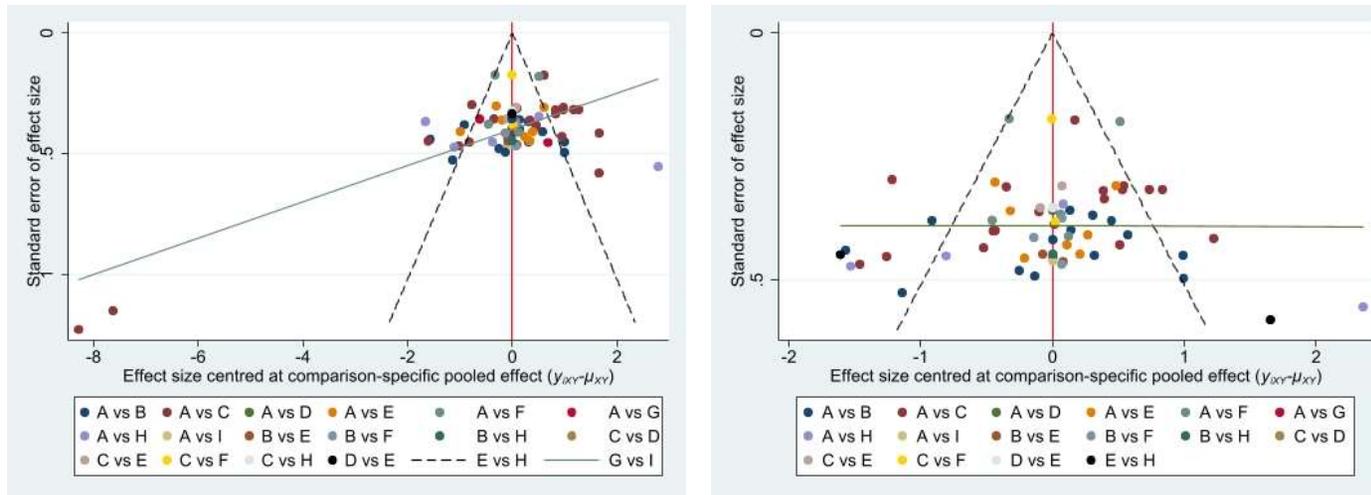


Local inconsistency test results for glucose (left), insulin (middle) and Triacylglycerol (right) responses. A = (reference), prolonged sitting; B = Every 20-min interruption; C = Every 30-min interruption; D = Every 45-min interruption; E = Every 60-min interruption; F = a single 30-min exercise bout; G = a single 45-min exercise bout; H = a single 60-min exercise bout; I = three 15-min bouts after meals.

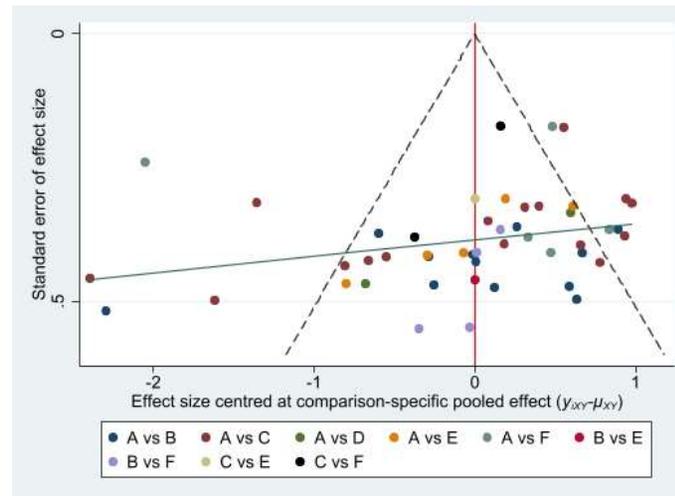
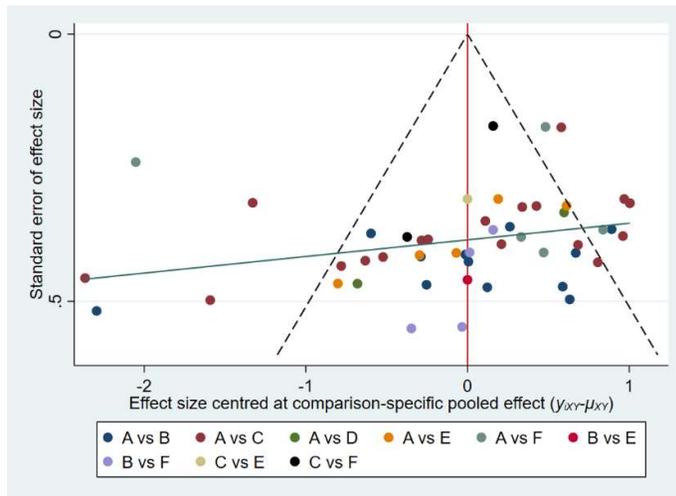
**Table S2 The ranking of interventions for glucose and insulin in the network meta-analysis.**

<b>Glucose</b>		<b>Insulin</b>	
<b>Treatment</b>	<b>SUCRA (%)*</b>	<b>Treatment</b>	<b>SUCRA (%)*</b>
Prolonged sitting	18.3	Prolonged sitting	8.2
Every 20-min interruption	60.5	Every 20-min interruption	73.7
Every 30-min interruption	81.8	Every 30-min interruption	77.5
Every 45-min interruption	59.0		
Every 60-min interruption	59.6	Every 60-min interruption	41.6
A single 30-min exercise bout	20.2	A single 30-min exercise bout	68.8
A single 45-min exercise bout	74.3		
A single 60-min exercise bout	31.9	A single 60-min exercise bout	30.2
Three 15-min bouts after meals	44.5		

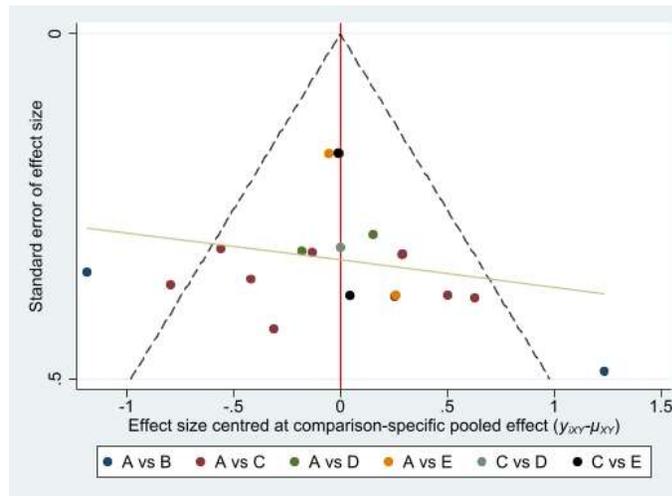
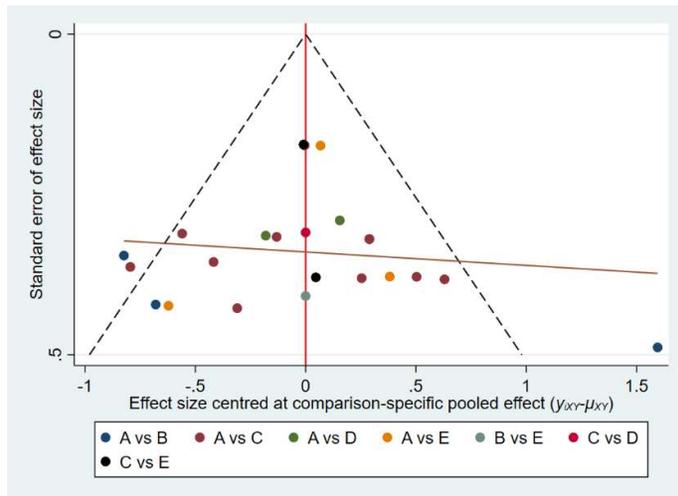
Figure S4 Funnel plots for each outcome in the network meta-analysis for glucose, insulin and triacylglycerol.



Funnel plots for each outcome in the network meta-analysis for glucose in the sample as a whole (left) and excluding the sample with type 2 diabetes (right). A = (reference), prolonged sitting; B = Every 20-min interruption; C = Every 30-min interruption; D = Every 45-min interruption; E = Every 60-min interruption; F = a single 30-min exercise bout; G = a single 45-min exercise bout; H = a single 60-min exercise bout; I = three 15-min bouts after meals.



Funnel plots for each outcome in the network meta-analysis for insulin in the sample as a whole (left) and excluding the sample with type 2 diabetes (right). A = (reference), prolonged sitting; B = Every 20-min interruption; C = Every 30-min interruption; D = Every 60-min interruption; E = a single 30-min exercise bout; F = a single 60-min exercise bout.



Funnel plots for each outcome in the network meta-analysis for triacylglycerol in the sample as a whole (left) and excluding the sample with hypertriglyceridemia (right). A = (reference), prolonged sitting; B = Every 20-min interruption; C = Every 30-min interruption; D = Every 60-min interruption; E = a single 30-min exercise bout.

**TableS3 The risk of bias assessment of included studies.**

Sources	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other bias
Altenburg et al 2019	Low	High	High	Unclear	Low	Low	Unclear
Bailey et al 2015	Unclear	Unclear	High	Unclear	Low	Unclear	Unclear
Bailey et al 2016	Unclear	Unclear	High	Unclear	Low	Unclear	Unclear
Bailey et al 2022	Low	Low	High	High	Low	Low	Low
Benatti et al 2017	Low	Unclear	High	Unclear	Low	Low	Unclear
Bhammar et al 2017	Unclear	Unclear	High	Unclear	Low	Unclear	Unclear
Blakenship et al. 2014	Unclear	Unclear	High	High	Low	Low	Low
Champion et al. 2018	Low	Unclear	High	Unclear	Unclear	Unclear	Unclear
Charlett et al. 2021	Low	Low	High	High	Low	Unclear	Unclear
Chen et al. 2018	Unclear	Unclear	High	High	Low	Low	Low
Christmas et al. 2019	Low	Unclear	High	Unclear	Low	Unclear	Unclear
Dempsey et al. 2016	Low	Low	High	Low	Low	Low	Low
Di Pietro et al. 2013	Unclear	Unclear	High	High	Low	Low	Low
Dunstan et al. 2012	Low	Low	High	Low	Low	Low	Unclear
Duvivier et al. 2013	Unclear	Unclear	High	Unclear	Unclear	Low	Unclear
Duvivier et al. 2017br	Low	Low	High	Low	Low	Low	Low
Duvivier et al. 2017be	Low	Low	High	Low	Low	Low	Low
Hansen et al. 2016	Unclear	Unclear	High	Unclear	Low	Unclear	Unclear
Hawari et al. 2019	unclear	Low	High	Unclear	Low	Unclear	Unclear
Henson et al. 2016	Low	Unclear	High	Unclear	Low	Unclear	Unclear

Sources	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other bias
Holmstrup et al. 2014	Low	Unclear	High	Unclear	Low	Unclear	Unclear
Honda et al. 2016	Unclear	Unclear	High	High	Low	Low	Low
Kashiwabara et al. 2018	Unclear	Unclear	High	High	Low	Low	Low
Kerr et al. 2017	Low	High	High	High	Low	Low	Unclear
Larsen et al. 2015	Unclear	Unclear	High	Unclear	High	Low	Unclear
Ma et al. 2020	Low	Low	High	Unclear	Low	Low	Unclear
Maylor et al. 2019	Unclear	Low	High	Unclear	Low	Unclear	Unclear
McCarthy et al. 2017b	Unclear	Unclear	High	High	Low	Low	Low
McCarthy et al. 2017f	Unclear	Unclear	High	High	Low	Low	Low
Miyashita et al. 2016	Low	Unclear	High	Unclear	Low	Unclear	Unclear
Newsom et al. 2013	Unclear	Unclear	High	Unclear	Low	Unclear	Unclear
Peddie et al. 2013	Low	Low	High	Unclear	Low	Low	Unclear
Peddie et al. 2021	Low	Low	High	High	Low	High	Low
Pulsford et al. 2017	Low	Low	High	Unclear	Low	Unclear	Unclear
Van Dijk et al. 2013	Unclear	Unclear	High	High	Low	High	Low
Wheeler et al. 2020	Low	Low	High	High	Low	Low	Low
Wong et al. 2021	Low	Low	High	High	Low	Low	Low
Yates et al. 2020	Low	Low	High	Low	Low	Low	Unclear