

Supplementary Materials

The effects of intermittent hypoxic training strategies on maximal oxygen uptake in healthy humans: a meta-analysis with meta-regression

Running head: Hypoxic training strategies and VO₂max

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Search Strategy

Search strategy used for Pubmed:

(Hypoxia training[Tiab]) OR (hypoxic training[Tiab]) OR (intermittent hypoxia[Tiab]) OR (altitude training[Tiab]) OR (intermittent hypoxic[Tiab]) OR (hypoxic conditioning[Tiab]) OR (hypoxia conditioning[Tiab]) OR ("live high"[Tiab]) OR ("live low"[Tiab]) OR ("living high"[Tiab]) OR ("living low"[Tiab]) OR ("train high"[Tiab]) OR ("train low"[Tiab]) OR ("training high"[Tiab]) OR ("training low"[Tiab]) OR ("repetitive hypoxia"[Tiab]) OR ("repeated hypoxia"[Tiab]) OR ("cyclic hypoxia"[Tiab]) NOT (animal[Tiab]) NOT (animals[Tiab]) NOT (rodent[Tiab]) NOT (rodents[Tiab]) NOT (rat[Tiab]) NOT (rats[Tiab]) NOT (mice[Tiab]) NOT (mouse[Tiab]) NOT (fish[Tiab])

Search strategy used for Web of Science:

((TI=Hypoxia training OR AB=Hypoxia training) OR (TI=hypoxic training OR AB=hypoxic training) OR (TI=intermittent hypoxia OR AB=intermittent hypoxia) OR (TI=altitude training OR AB=altitude training) OR (TI=intermittent hypoxic OR AB=intermittent hypoxic) OR (TI=hypoxic conditioning OR AB=hypoxic conditioning) OR (TI=hypoxia conditioning OR AB=hypoxia conditioning) OR (TI="live high" OR AB="live high") OR (TI="live low" OR AB="live low") OR (TI="living high" OR AB="living high") OR (TI="train high" OR AB="train high") OR (TI="train low" OR AB="train low") OR (TI="training high" OR AB="training high") OR (TI="training low" OR AB="training low") OR (TI="living low" OR AB="living low") OR (TI="repetitive hypoxia" OR AB="repetitive hypoxia") OR (TI="repeated hypoxia" OR AB="repeated hypoxia") OR (TI="cyclic hypoxia" OR AB="cyclic hypoxia")) NOT (TI=animal OR AB=animal) NOT (TI=animals OR AB=animals) NOT (TI=rodent OR AB=rodent) NOT (TI=rodents OR AB=rodents) NOT (TI=rat OR AB=rat) NOT (TI=rats OR AB=rats) NOT (TI=mice OR AB=mice) NOT (TI=mouse OR AB=mouse) NOT (TI=fish OR AB=fish)

Search strategy used for Embase:

(Hypoxia AND training):ti,ab OR (hypoxic AND training):ti,ab OR (intermittent AND hypoxia):ti,ab OR (altitude AND training):ti,ab OR (intermittent AND hypoxic):ti,ab OR (hypoxic AND conditioning):ti,ab OR (hypoxia AND conditioning):ti,ab OR "live high":ti,ab OR "live low":ti,ab OR "living high":ti,ab OR "living low":ti,ab OR "train high":ti,ab OR "train low":ti,ab OR "training high":ti,ab OR "training low":ti,ab OR "repetitive hypoxia":ti,ab OR "repeated hypoxia":ti,ab OR "cyclic hypoxia":ti,ab NOT animal:ti,ab NOT animals:ti,ab NOT rodent:ti,ab NOT rodents:ti,ab NOT rat:ti,ab NOT rats:ti,ab NOT mice:ti,ab NOT mouse:ti,ab NOT fish:ti,ab

	Risk of bias domains					
	D1	D2	D3	D4	D5	Overall
Study						
Zebrowska, A. 2025	⊖	⊗	⊕	⊕	⊖	⊗
Park, H.Y. 2025	⊕	⊕	⊕	⊕	⊕	⊕
Geng, Z. 2025	⊗	⊗	⊕	⊖	⊖	⊗
Kirkaya, I. 2024	⊖	⊖	⊖	⊗	⊖	⊗
Pramkratok, W. 2022	⊗	⊗	⊕	⊖	⊗	⊗
Ambrozy, T. 2020	⊗	⊖	⊕	⊗	⊗	⊖
Park, H.Y. 2019	⊕	⊖	⊕	⊖	⊕	⊖
Zebrowska, A. 2019	⊕	⊖	⊕	⊖	⊕	⊖
Czuba, M. 2019	⊕	⊖	⊕	⊖	⊕	⊖
Wang, R. 2019	⊕	⊕	⊕	⊕	⊕	⊕
Park, H.-Y. 2018	⊕	⊗	⊕	⊕	⊕	⊗
Czuba, M. 2018	⊕	⊗	⊕	⊕	⊕	⊗
Chen, Y.C. 2018	⊕	⊗	⊕	⊕	⊕	⊗
Ramos-Campo, D.J. 2018	⊕	⊖	⊕	⊖	⊕	⊖
Schmitt, L. 2018	⊕	⊗	⊕	⊕	⊕	⊗
Czuba, M. 2017	⊕	⊗	⊕	⊕	⊕	⊗
Biggs, N.C. 2017	⊕	⊖	⊕	⊖	⊕	⊖
Menz, V. 2016	⊕	⊖	⊕	⊖	⊕	⊖
Ramos-Campo, D.J. 2015	⊕	⊗	⊕	⊗	⊕	⊗
Millet, G. 2014	⊕	⊗	⊕	⊗	⊕	⊗
Robach, P. 2014	⊕	⊕	⊕	⊕	⊕	⊕
Czuba, M. 2013	⊗	⊗	⊕	⊗	⊕	⊗
Morishima, T. 2014	⊕	⊗	⊕	⊗	⊕	⊗
Burtscher, M. 2010	⊕	⊖	⊕	⊖	⊕	⊖
Robertson, E.Y. 2010a	⊕	⊗	⊕	⊗	⊕	⊗
Lecoultre, V. 2010	⊕	⊖	⊕	⊖	⊕	⊖
Haufe, S. 2008	⊕	⊖	⊕	⊖	⊕	⊖
Roels, B. 2007a	⊕	⊗	⊕	⊗	⊕	⊗
Neya, M. 2007	⊕	⊗	⊕	⊗	⊕	⊗
Wang, J.S. 2007	⊕	⊗	⊕	⊗	⊕	⊗
Roels, B. 2007b	⊗	⊗	⊕	⊗	⊕	⊗
Robach, P. 2006	⊕	⊗	⊕	⊗	⊕	⊗
Dufour, S.P. 2006	⊕	⊗	⊕	⊗	⊕	⊗
Ponsot, E. 2006	⊕	⊗	⊕	⊗	⊕	⊗
Brugniaux, J.V. 2006	⊕	⊗	⊕	⊗	⊕	⊗
Messonnier, L. 2004	⊕	⊗	⊕	⊗	⊕	⊗
Katayama, K. 2004	⊕	⊖	⊕	⊖	⊕	⊖
Kime, R. 2003	⊕	⊗	⊕	⊗	⊕	⊗
Ventura, N. 2003	⊕	⊗	⊕	⊗	⊕	⊗
Levine, B.D. 1997	⊗	⊕	⊗	⊖	⊗	⊗
Burtscher, M. 1996	⊕	⊗	⊕	⊗	⊕	⊗
Schega, L. 2016	⊕	⊖	⊕	⊖	⊕	⊖
Porcari, J.P. 2016	⊕	⊗	⊕	⊗	⊕	⊗
Giovanna, M. 2022	⊕	⊗	⊕	⊗	⊕	⊗
Dellavechia de Carvalho, C. 2022	⊕	⊖	⊕	⊖	⊕	⊖
Wang, J.S. 2010	⊕	⊗	⊕	⊗	⊕	⊗
Allsopp, G.L. 2022	⊕	⊖	⊕	⊖	⊕	⊖
Camacho-Cardenosa, M. 2017	⊕	⊖	⊕	⊖	⊕	⊖
Emonson, D.L. 1997	⊕	⊕	⊕	⊕	⊕	⊕
Julian, C.G. 2004	⊕	⊕	⊕	⊕	⊕	⊕
Kasai, N. 2019	⊕	⊖	⊕	⊖	⊕	⊖
Masuda, K. 2001	⊕	⊗	⊕	⊗	⊕	⊗
Nishiwaki, M. 2016	⊕	⊗	⊕	⊗	⊕	⊗
Rodríguez, F.A. 2007	⊕	⊕	⊕	⊕	⊕	⊕
Wang, J.S. 2017	⊕	⊗	⊕	⊗	⊕	⊗
Beidleman, B.A. 2003	⊖	⊗	⊖	⊗	⊗	⊗
Kasai, N. 2017	⊕	⊖	⊕	⊖	⊕	⊖
Dehnert, C. 2002	⊕	⊗	⊕	⊗	⊕	⊗
Vogt, M. 2001	⊕	⊗	⊕	⊗	⊕	⊗
Bailey, D.M. 2000	⊕	⊕	⊕	⊕	⊕	⊕
Katayama, K. 1999	⊕	⊗	⊕	⊗	⊕	⊗
Wang, J.S. 2015	⊕	⊗	⊕	⊗	⊕	⊗

Domains:

D1: Bias arising from the randomization process.
D2: Bias due to deviations from intervention.
D3: Bias due to missing outcome data.
D4: Bias in measurement of the outcome.
D5: Bias in selection of the reported result.

Judgement

⊗ High
⊖ Some concerns
⊕ Low

Figure S1. Traffic light plot of the revised tool for assessing risk of bias in randomised trials (RoB2).

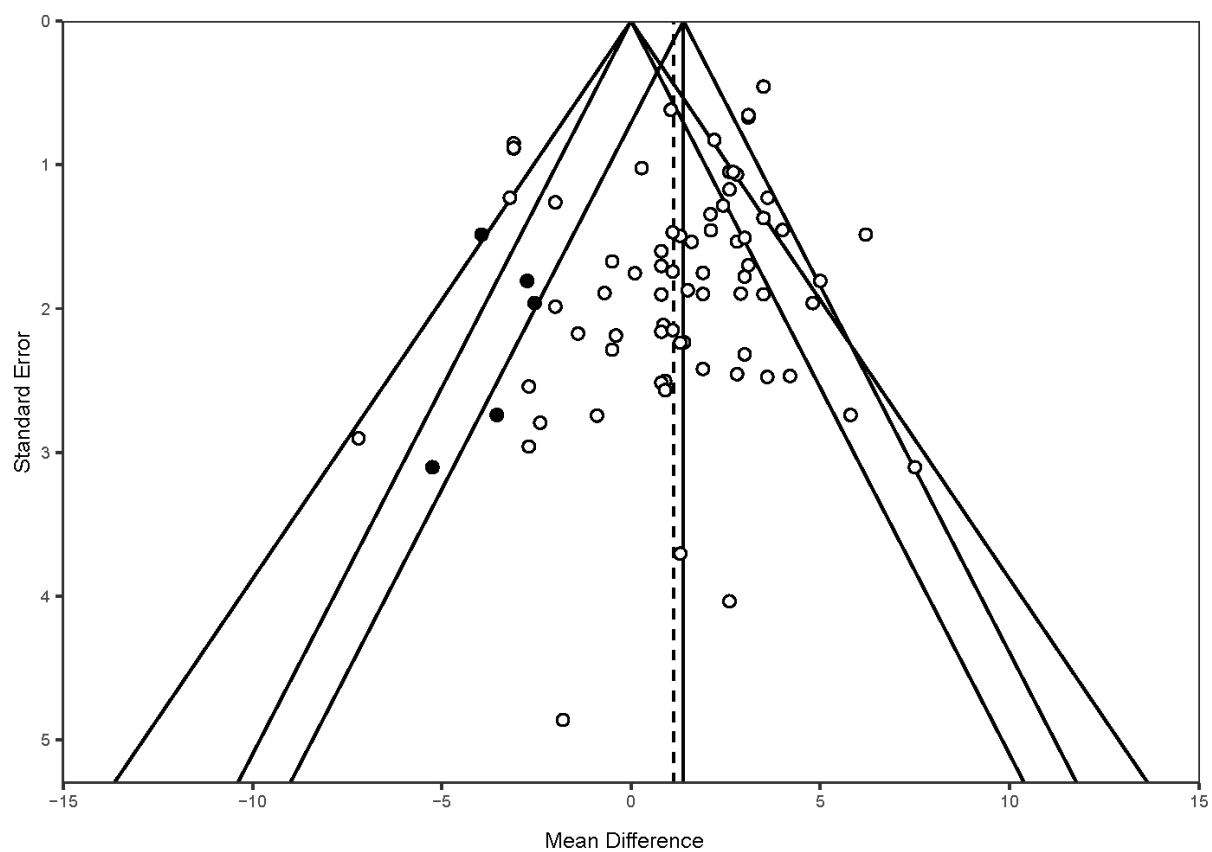


Figure S2. Funnel plot for the mean differences of the included studies. The standard error of each individual study is plotted against its mean difference.