

SUPPLEMENTARY DATA

# **Effects of Resistance Exercise on Neuroprotective Factors in Middle and Late Life: A Systematic Review and Meta-Analysis**

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**Supplementary Table 1.** Database search strategy.

Database	Search strategy
CINAHL	
Cochrane	
MEDLINE	("strength exercise" OR "resistance exercise" OR "strength training" OR "resistance training" OR "weight training" OR "weight lifting") AND (IGF-1 OR "insulin-like growth factor 1" OR BDNF OR "brain-derived neurotrophic factor" OR VEGF OR "vascular endothelial growth factor") AND (random* control* trials) NOT (animal OR rat OR mouse)
SPORTDiscus	
Scopus	
Web of Science	
PEDro	strength training IGF-1 randomized clinical trial resistance training IGF-1 randomized clinical trial strength training BDNF randomized clinical trial resistance training BDNF randomized clinical trial strength training VEGF randomized clinical trial resistance training VEGF randomized clinical trial

Abbreviations: BDNF = brain-derived neurotrophic factor, IGF-1 = insulin-like growth factor type 1, VEGF = vascular endothelial growth factor

**Supplementary Table 2.** Subgroup analysis of the effect of resistance exercise on IGF-1 by sex.

Subgroup	n	SMD (95% CI)	I <sup>2</sup>	p
Man	5	0.77 (0.48, 1.06)	0.0%	0.599
Woman	16	0.49 (0.18, 0.79)	61.6%	0.001

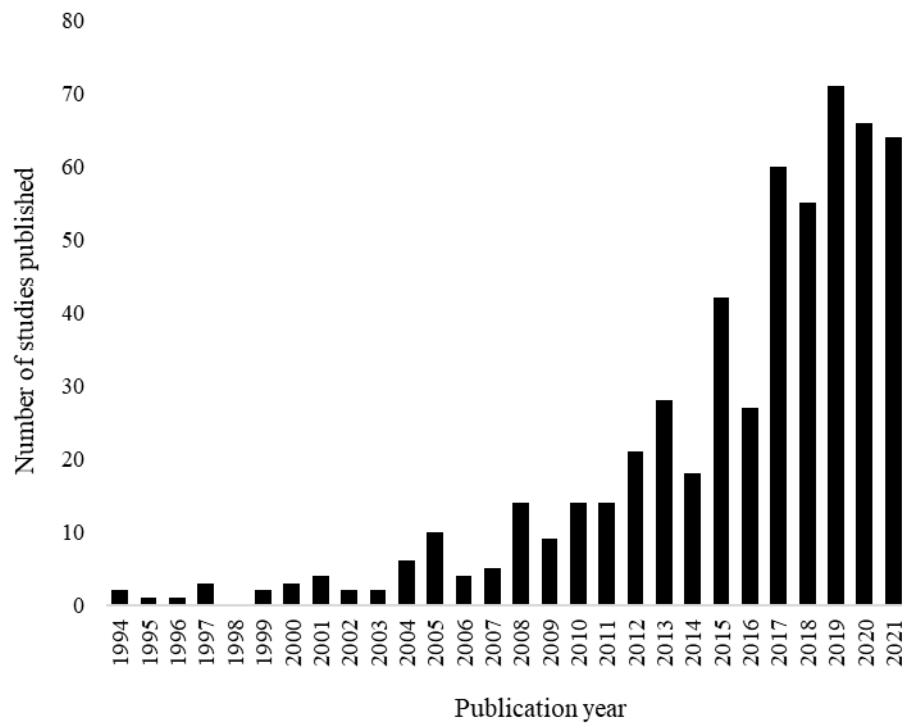
Abbreviations: CI = confidence interval, SMD = standardized mean differences, IGF-1 = insulin-like growth factor type 1

**Supplementary Table 3.** Meta-regression analysis of the effect of resistance exercise versus control group on IGF-1 levels.

	n	Age $\beta$ (95% CI)	p	n	BMI $\beta$ (95% CI)	p
<b>IGF-1</b>	24	-0.288 (-0.866, 0.291)	0.313	24	-0.011 (-0.054, 0.033)	0.619

BMI Body mass index, IGF-1 Insulin-like growth factor type 1

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**Supplementary Figure 1.** Number of studies published per year.

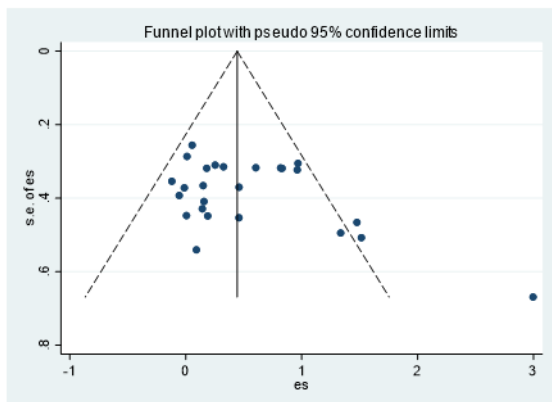
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	Randomization process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported result	Overall Bias	
Arazi et al, 2020	+	?	+	+	?	!	+
Bermon et al, 1999	?	?	+	+	?	!	?
Bagheri et al, 2021	?	+	+	+	?	!	+
Benitalebi et al, 2020	+	+	+	+	?	!	?
Casshilas et al, 2010	?	?	+	+	?	!	+
Casshilas et al, 2007	?	?	+	?	?	!	?
Chen et al, 2017	?	⊖	?	+	?	⊖	⊖
Chen et al, 2019	+	?	+	?	?	!	+
Coelho-Junior et al, 2020	+	⊖	+	+	+	⊖	⊖
Copeland et al, 2014	?	+	+	+	?	!	?
Cunha et al, 2020	+	?	+	+	?	!	+
Daly et al, 2005	?	⊖	?	+	?	⊖	⊖
Deus et al, 2021	+	+	+	+	?	!	+
Fragala et al, 2014	?	?	+	+	?	!	?
Hofmann et al, 2016	?	⊖	?	+	?	⊖	⊖
Hvid et al, 2017	?	⊖	+	+	+	⊖	⊖
Nunes et al, 2019	?	+	+	+	?	!	?
Orsatti et al, 2008	?	+	+	+	?	!	?
Parkhouse et al, 2010	⊖	?	+	+	?	⊖	⊖
Pyka et al, 1994	?	?	+	+	?	!	?
Ruiz et al, 2015	?	+	+	+	?	!	?
Sartorio et al, 2001	?	?	+	+	?	!	?
So et al, 2013	?	⊖	+	+	?	⊖	⊖
Son et al, 2020	?	+	+	+	?	!	?
Tomelari et al, 2020	?	⊖	+	+	?	⊖	⊖
Tsai et al, 2015	?	?	⊖	+	?	!	?
Urzi et al, 2019	?	⊖	?	+	?	⊖	⊖
Vale et al, 2017	?	⊖	+	+	?	⊖	⊖
Vale et al, 2014	?	⊖	+	?	?	⊖	⊖
Valkeinen et al, 2005	?	+	+	+	?	!	?

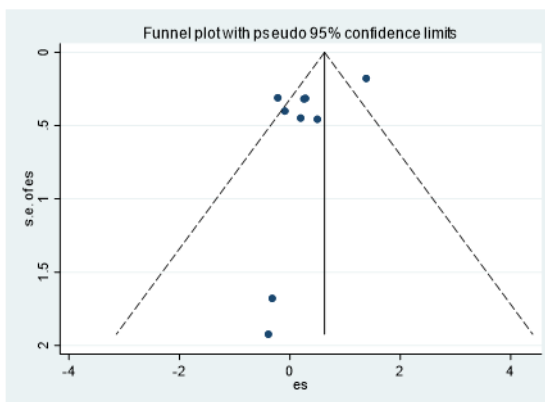
Supplementary Figure 2. Risk of Bias (RoB 2.0).

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**A** IGF-1



**B** BDNF



**Supplementary Figure 3.** Funnel plot with 95% pseudo confidence limits for: A. IGF-1; B. BDNF.