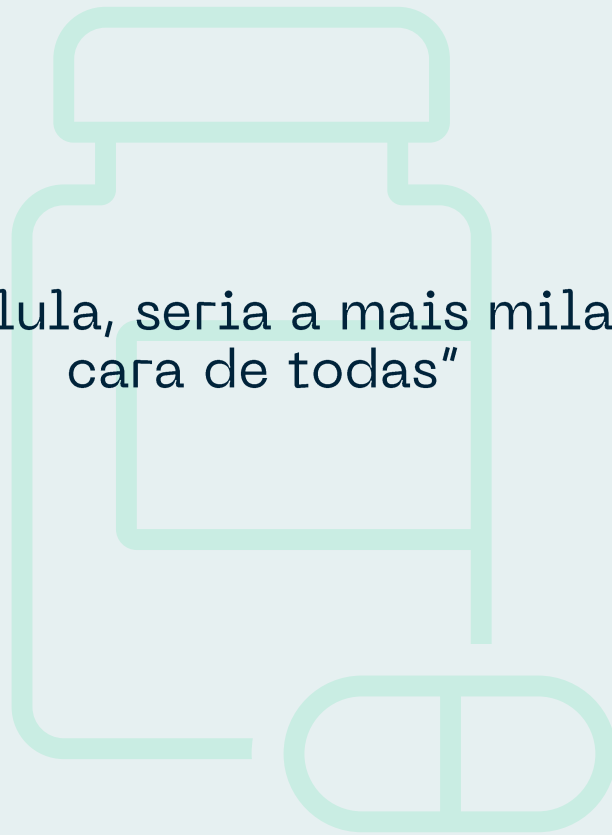# Quanto vale se mexer?
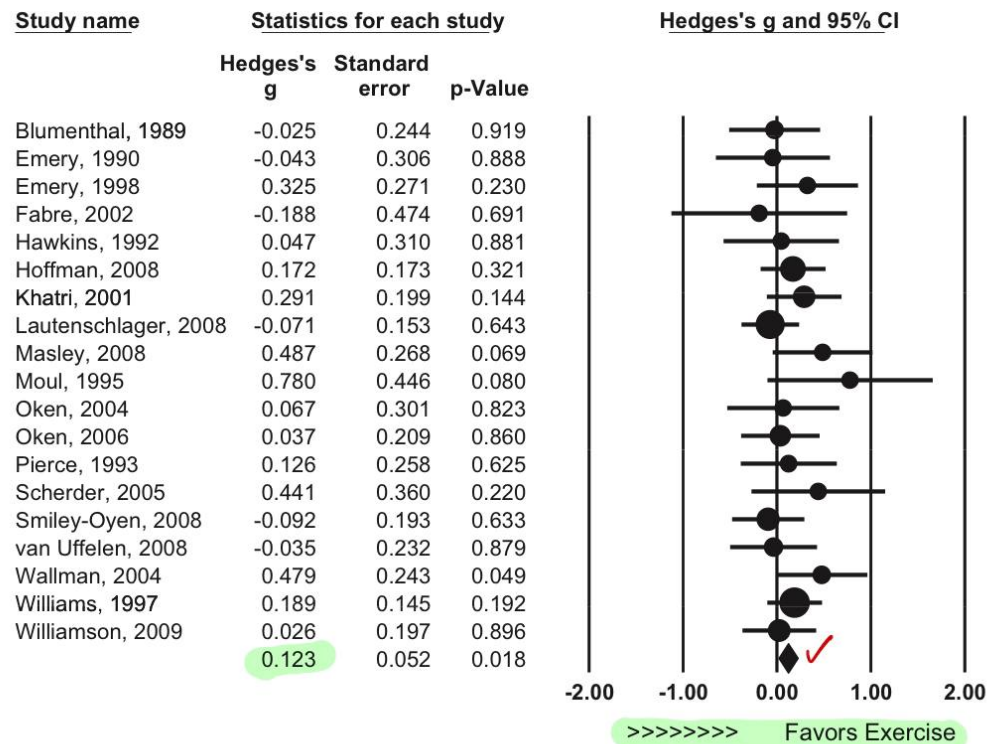
"Se fosse um pílula, seria a mais milagrosa e mais cara de todas"

Melhora Sua Performance

Executive Function

Study name	Hedges's g	Standard error	p-Value
Blumenthal, 1989	-0.025	0.244	0.919
Emery, 1990	-0.043	0.306	0.888
Emery, 1998	0.325	0.271	0.230
Fabre, 2002	-0.188	0.474	0.691
Hawkins, 1992	0.047	0.310	0.881
Hoffman, 2008	0.172	0.173	0.321
Khatri, 2001	0.291	0.199	0.144
Lautenschlager, 2008	-0.071	0.153	0.643
Masley, 2008	0.487	0.268	0.069
Moul, 1995	0.780	0.446	0.080
Oken, 2004	0.067	0.301	0.823
Oken, 2006	0.037	0.209	0.860
Pierce, 1993	0.126	0.258	0.625
Scherder, 2005	0.441	0.360	0.220
Smiley-Oyen, 2008	-0.092	0.193	0.633
van Uffelen, 2008	-0.035	0.232	0.879
Wallman, 2004	0.479	0.243	0.049
Williams, 1997	0.189	0.145	0.192
Williamson, 2009	0.026	0.197	0.896
	0.123	0.052	0.018

Hedges's g and 95% CI

-2.00 -1.00 0.00 1.00 2.00

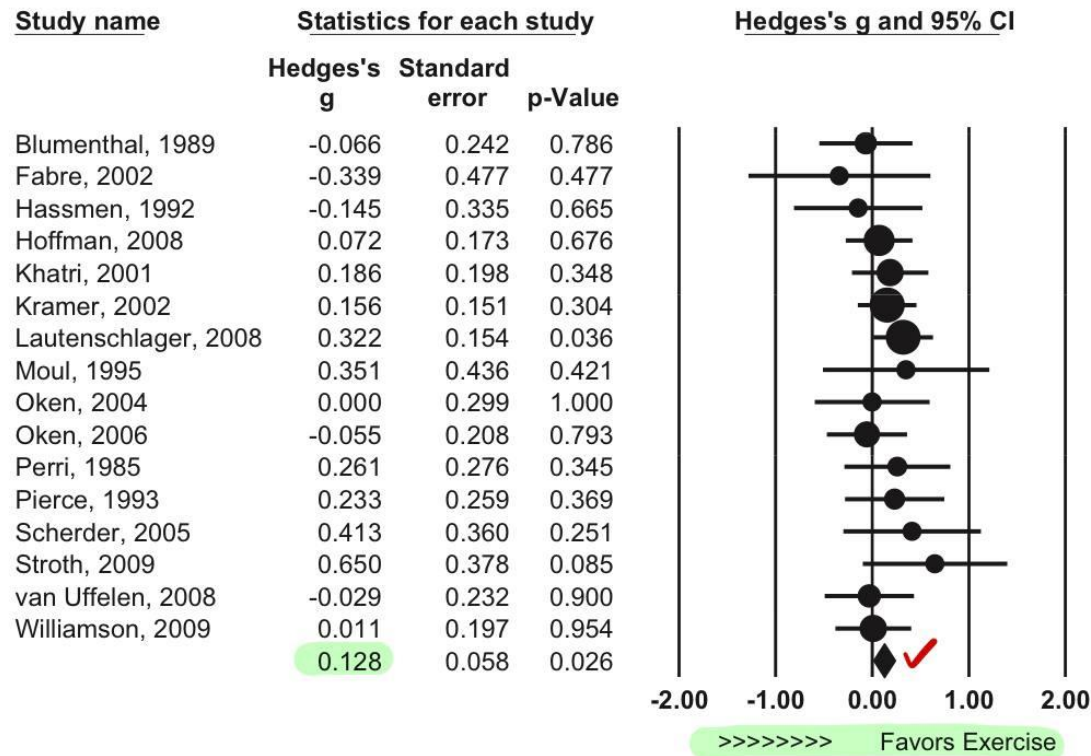>>>>>>>> Favors Exercise

Flexibilidade Cognitiva
– Priorizar
– Entender sequências
– Trocar de Tarefas
– Seguir direções

Auto Controle
– Disciplina
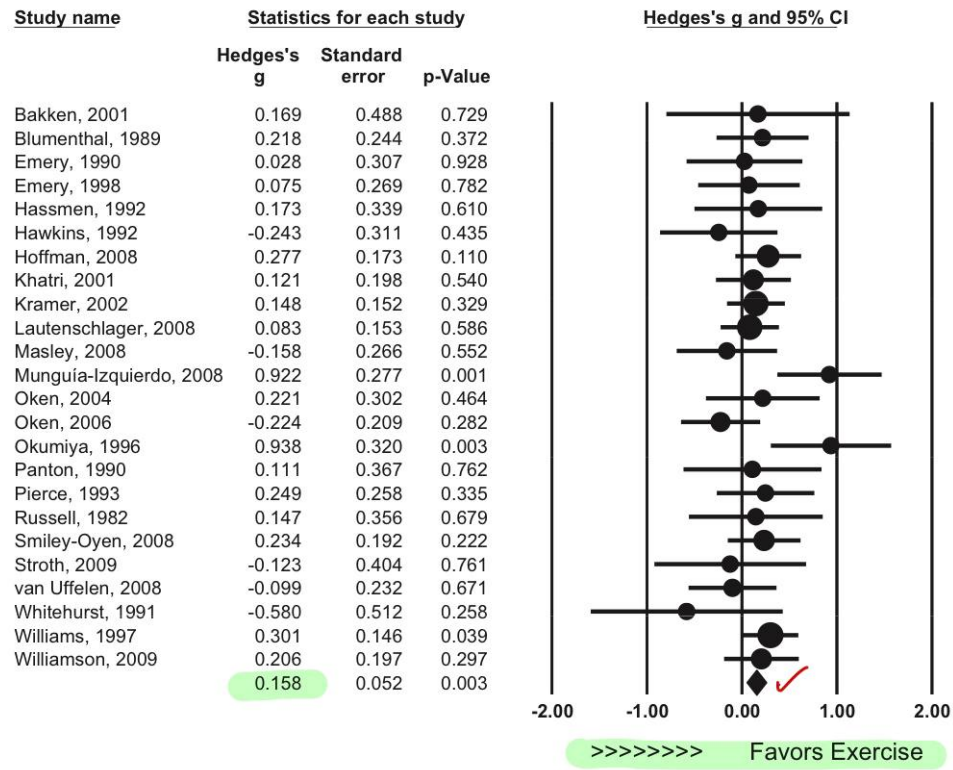– Regulação emocional
– Auto consciência

Aumento de Memória

Atenção e Velocidade

Exercício vs Antidepressivo

Comparative effectiveness of exercise, antidepressants and their combination in treating non-severe depression: a systematic review and network meta-analysis of randomised controlled trials

Francesco Recchia,[1] Chit K Leung,[1] Edwin C Chin,[1] Daniel Y Fong,[2] David Montero,[1] Calvin P Cheng,[3] Suk Yu Yau,[4] Parco M Siu [1]
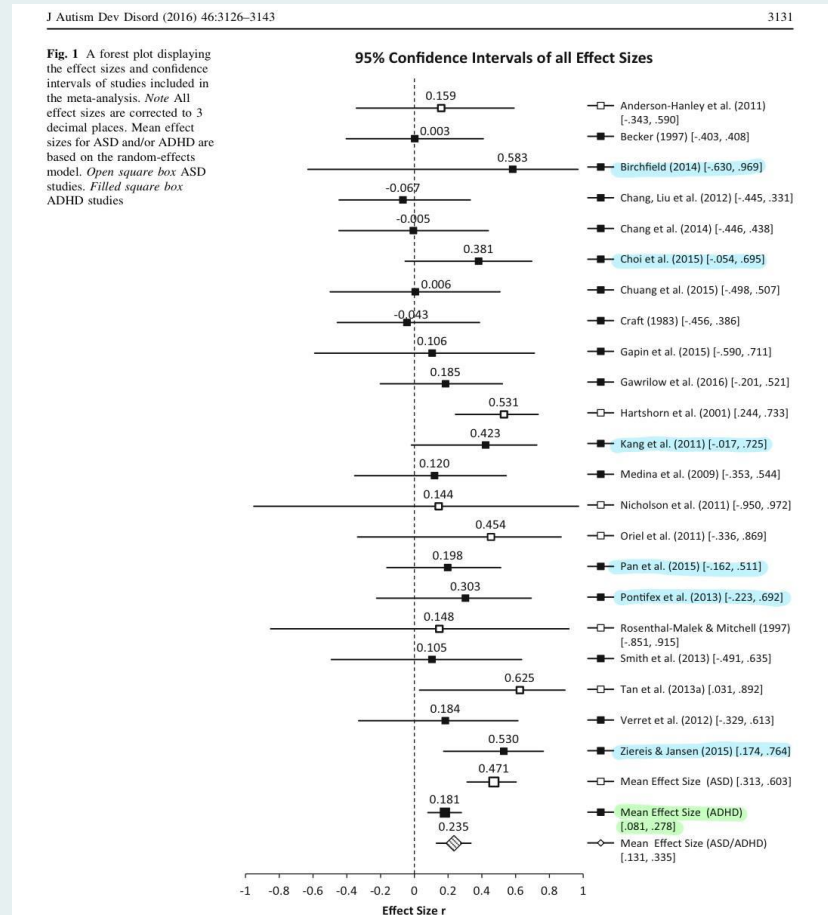
Funciona tão bem quanto ou até melhor que a medicação para tratar sintomas depressivos
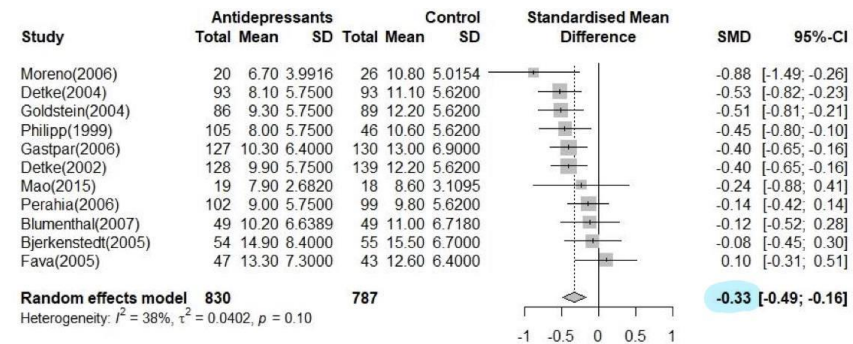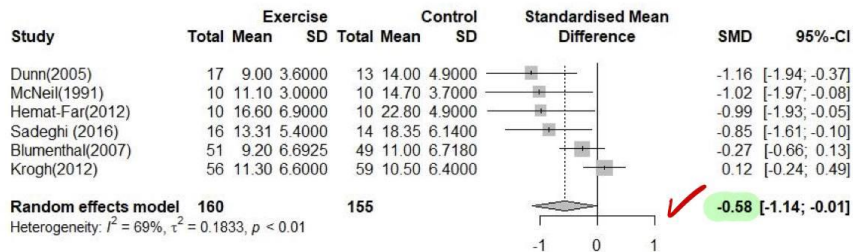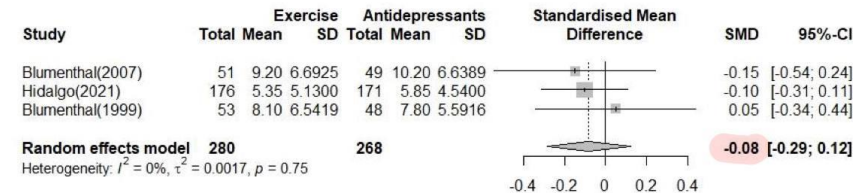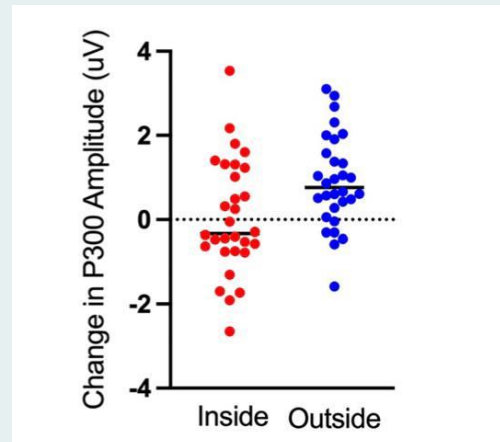
Melhoras para TDAH

Função Executiva

– Priorizar
– Entender sequências
– Trocar de Tarefas
– Seguir direções
– Capacidade atencional

J Autism Dev Disord (2016) 46:3126–3143 — 3131

Fig. 1 A forest plot displaying the effect sizes and confidence intervals of studies included in the meta-analysis. Note All effect sizes are corrected to 3 decimal places. Mean effect sizes for ASD and/or ADHD are based on the random-effects model. Open square box ASD studies. Filled square box ADHD studies

Bônus: Atividade Externa

15 min de caminhada
 Dentro vs Fora
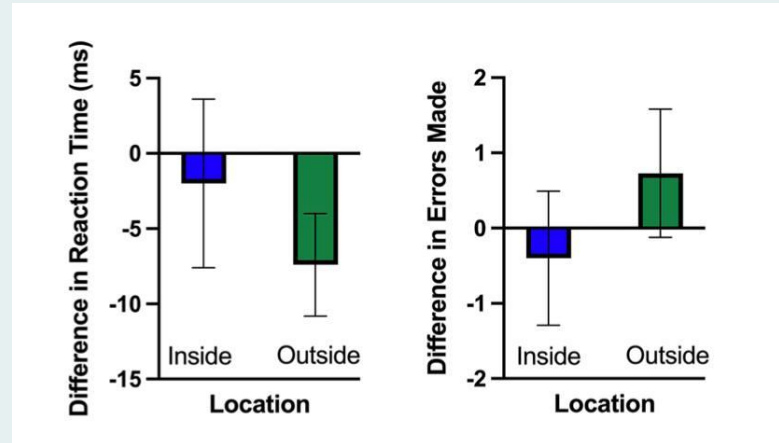
Capacidade
decisória

Flexibilidade
cognitiva

Efeito Agudos (Imediatos)

Brain and Behavioral Changes	Exercise Protocol	20 min	40 min	60 min	80 min	100 min	120 min	...	24 hrs +
A. Behavioral Changes									
Prefrontal-Dependent Cognitive Function [27]	50 min cycling at 85% of age-predicted MHR, with additional 5 min warmup and cooldown	(120 min)							
Mood									
Enhanced positive mood states [28]	A range of exercise modes at varying intensities (low to very high) for a duration of 7 to over 75 min	(24 hrs)							
Decreased negative mood states [29]	30 min of aerobic exercise class at age-predicted 60-80% of MHR	(24 hrs)							
Stress Reduction [30]	60 or 120 min of cycling at 50-55% of VO₂ max, with additional 3 min warmup	(3 hrs)							
B. Neurophysiological Changes									
Extracellular Recording									
Increased theta [70]	5 min of treadmill running at speeds ranging from 1 to 22 cm/sec	(6 min)							
EEG									
Increased delta, theta, alpha and beta [66]	A range of exercise modes at various intensities for a duration of 2 to 60 min	(30 min)							
Increased P300 amplitude [88]	20 min of treadmill walking at 60% of age-predicted MHR	(25 min)							
Decreased P300 latency [88]	20 min of treadmill walking at 60% of age-predicted MHR	(25 min)							
fNIRS									
Increased activation during task performance [100]	10 min of cycling at 50% of VO₂ max	(15 min)							
Increased HAROLD during task performance [103]	10 min of cycling at 50% of VO₂ max	(15 min)							
TMS									
Excitation [116]	20 min of cycling at 65-70% of age-predicted MHR, with additional 5 min warmup	(30 min)							
Inhibition [116]	20 min of cycling at 65-70% of age-predicted MHR, with additional 5 min warmup	(30 min)							
fMRI									
Increased hippocampal pattern similarity [113]	25 min of high-intensity interval cycling at 80% of age-predicted MHR, with additional 5 min warmup and cooldown	(48 hrs)							
Altered activation to an acute stressor [114]	30 min of treadmill walking/running at 60-70% of VO₂ max	(90 min)							
C. Neurochemical Changes									
Lactate [129]	Graded exercise test on a bicycle ergometer to 85% of age-predicted MHR	(40 min)							
Cortisol [141]		(120 min)							
Neurotrophins									
BDNF [179]	30 min treadmill running at low- (15 m/min) or moderate-intensity (25 m/min)	(90 min)							
IGF-1		?							
VEGF		?							
Neurotransmitters (see 197 for review)									
Dopamine [201]	20 min treadmill running at 12 m/min	(120 min)							
Norepinephrine [222]	120 min treadmill running at 25 m/min at a 3% slope	(70 min)							
Serotonin [214]	120 min treadmill running at 25 m/min	(120 min)							
Acetylcholine		?							
GABA [233]	Graded exercise test on a bicycle ergometer to ≥80% age-predicted MHR.	(20 min)							
Glutamate [201]	20 min treadmill running at 12 m/min	(40 min)							
Endogenous Opioids [240]	2 hrs of endurance running (21.5±4.7 km)	(30 min)							
Endocannabinoids		?							

Efeitos Agudos Diversos

Resistência a Estresse: Cortisol

Motivação & Bem-Estar: Dopamina & Serotonina

Função Executiva & Humor

Neurotrofinas: BDNF, IGF-1, VEGF: Neuroplasticidade

Neurogênese no Hipocampo