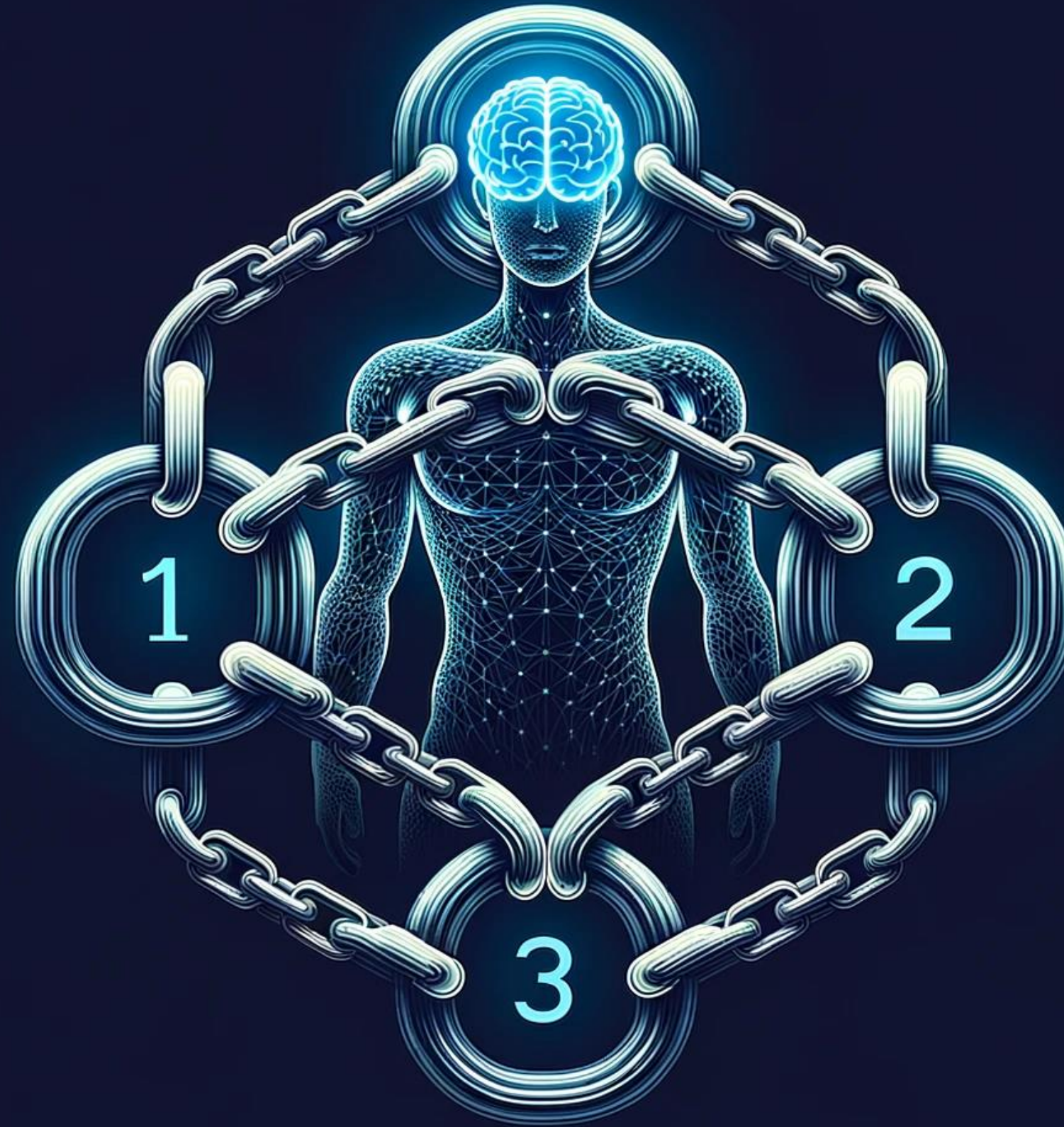


Physical Exercise in the Prevention & Treatment of Mental Illness



Dr. Joseph Firth

¹ University of Manchester

² Greater Manchester Mental Health NHS Foundation Trust

joseph.firth@manchester.ac.uk

World Psychiatry

OFFICIAL JOURNAL OF THE WORLD PSYCHIATRIC ASSOCIATION (WPA)

Volume 19, Number 3



October 2020

World Psychiatry

A meta-review of “lifestyle psychiatry”: the role of exercise, smoking, diet and sleep in the prevention and treatment of mental disorders

Joseph Firth^{1,2}, Marco Solmi³, Robyn E. Wootton⁴, Davy Vancampfort^{5,6}, Felipe B. Schuch⁷, Erin Hoare⁸, Simon Gilbody⁹, John Scott B. Teasdale¹¹, Sarah E. Jackson¹², Lee Smith¹³, Melissa Eaton², Felice N. Jacka¹⁴, Nicola Veronese¹⁵, Wolfgang Marx¹⁴, Garcia Ashdown-Franks¹⁶⁻¹⁸, Dan Siskind^{19,20}, Jerome Sarris^{2,21}, Simon Rosenbaum¹¹, André F. Carvalho^{22,23}, Brendon Stubbs¹

Methods:

Results from **29 meta-analyses of prospective/cohort studies, 12**

Mendelian randomization studies, 2 meta-reviews, and 2 meta-analyses of

RCTs were synthesized to generate overviews of the evidence for targeting

each of the specific lifestyle factors in the prevention and treatment of

depression, anxiety and stress-related disorders, schizophrenia, bipolar

disorder, and attention-deficit/hyperactivity disorder.

2020

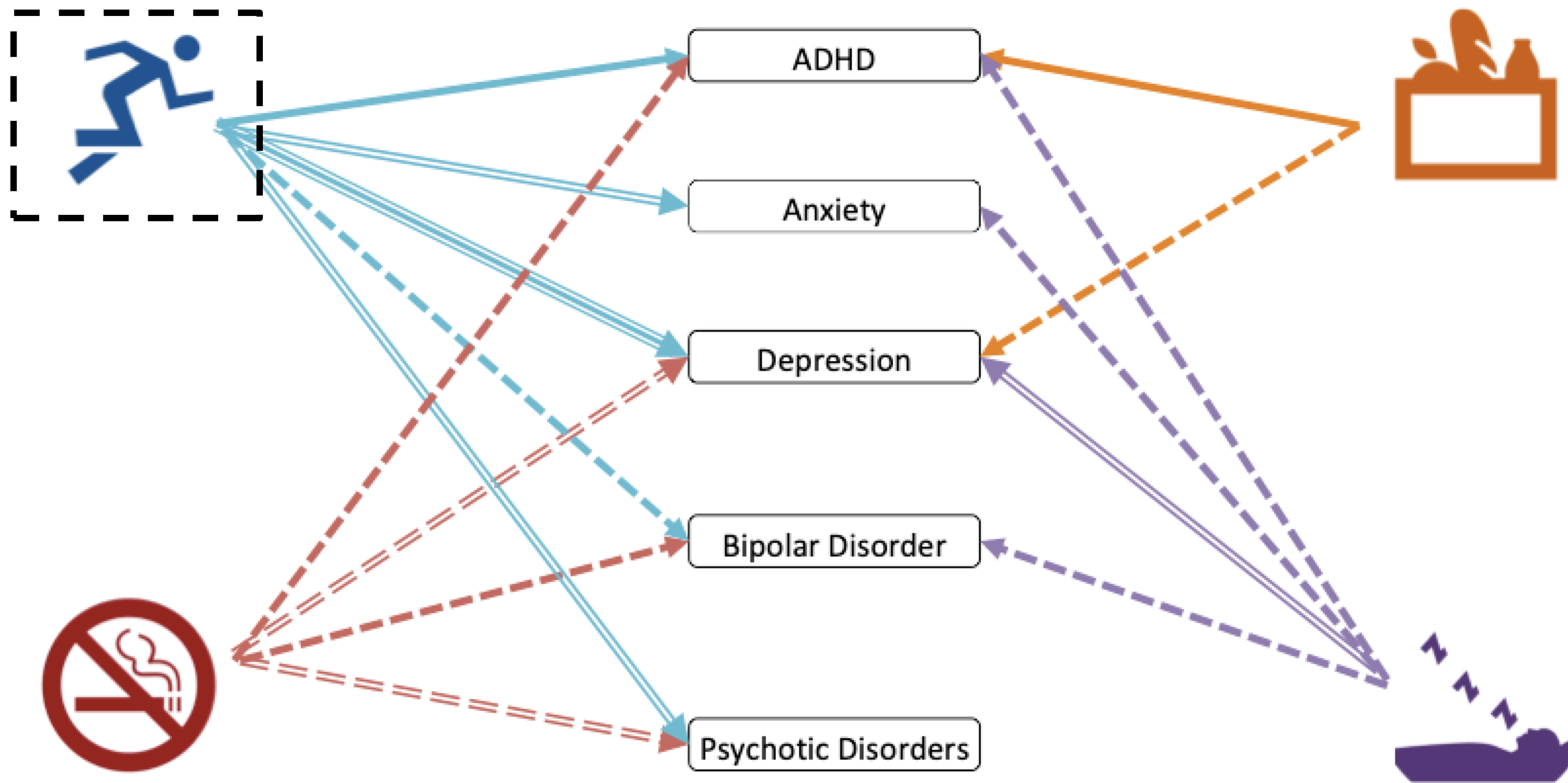


Figure 1. Lifestyle factors in the prevention and treatment of mental illness. The dashed line indicates evidence for protective benefit from either prospective meta-analyses (P-MAs) or Mendelian randomization studies (MRs). The double-dashed line indicates evidence for protective effects from both P-MAs and MRs. The solid line indicates evidence for efficacy in treatment of mental illness from MAs of randomized controlled trials (RCTs). The double solid line indicates convergent evidence from MRs or P-MAs with MAs of RCTs. The treble solid line indicates convergent evidence from all three (P-MAs + MRs + MAs of RCTs). ADHD – attention-deficit/hyperactivity disorder.

Physical Activity and Incident Depression: A Meta-Analysis of Prospective Cohort Studies

Schuch FB, Vancampfort D, Firth J et al..(2018)

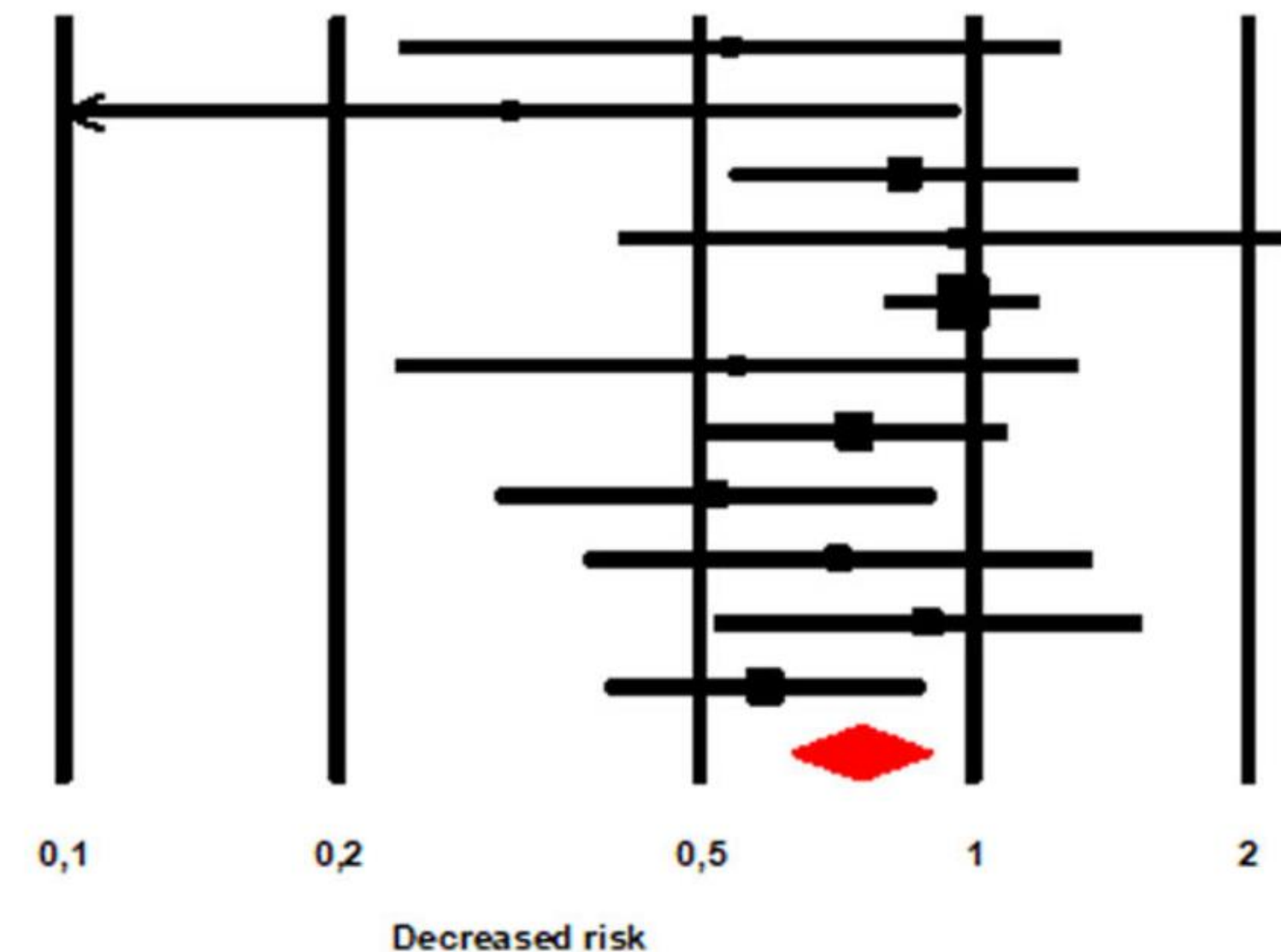
- **Question:** Can physical activity reduce the risk of developing depression over the life-course?
- **Method:** Combining ALL existing data (49 independent studies of over quarter of a million people) comparing onset of depression in non-active vs. active individuals

| Study Authors, Year, Reference | Odds Ratio | Lower Limit | Upper Limit | p | Adjusted Odds Ratio and 95% CI |
|------------------------------------|------------|-------------|-------------|-------|--------------------------------|
| Augestad et al., 2008 (30) (men) | 0.880 | 0.484 | 1.599 | 0.675 | |
| Augestad et al., 2008 (30) (women) | 0.910 | 0.343 | 2.415 | 0.850 | |
| Baumeister et al., 2017 (31) | 0.854 | 0.699 | 1.044 | 0.124 | |
| Cabello et al., 2017 (34) | 0.810 | 0.496 | 1.322 | 0.399 | |
| Chang et al., 2016 (36) | 0.610 | 0.359 | 1.036 | 0.068 | |
| Chen and Millar, 1999 (37) | 0.620 | 0.315 | 1.221 | 0.167 | |
| Choi et al., 2015 (38) | 0.750 | 0.639 | 0.881 | 0.000 | |
| Clark et al., 2007 (39) | 0.990 | 0.570 | 1.720 | 0.972 | |
| Da Silva et al., 2012 (42) | 0.840 | 0.566 | 1.247 | 0.387 | |
| España-Romero et al., 2013 (43) | 0.780 | 0.570 | 1.068 | 0.121 | |

REVIEW ARTICLE

Physical activity protects from incident anxiety: A meta-analysis of prospective cohort studies

| Study name | number of participants | Statistics for each study | | | |
|-------------------------------|------------------------|---------------------------|-------------|-------------|---------|
| | | Odds ratio | Lower limit | Upper limit | p-Value |
| Jonsdottir et al., 2011 | 2818 | 0,540 | 0,234 | 1,245 | 0,148 |
| Kang et al., 2016 | 1204 | 0,310 | 0,100 | 0,963 | 0,043 |
| Da Silva et al., 2012 | 9309 | 0,840 | 0,541 | 1,304 | 0,437 |
| McDowell et al., 2018 (1) | 3165 | 0,960 | 0,409 | 2,254 | 0,925 |
| Baumeister et al., 2017 | 1952 | 0,970 | 0,797 | 1,181 | 0,761 |
| Pasco et al., 2011 | 547 | 0,550 | 0,233 | 1,301 | 0,174 |
| Sanchez-Villegas et al., 2008 | 10381 | 0,740 | 0,503 | 1,088 | 0,126 |
| Strohle et al. 2017 | 2548 | 0,520 | 0,299 | 0,905 | 0,021 |
| Ten have et al., 2011 | 4796 | 0,710 | 0,374 | 1,347 | 0,295 |
| Zainahl et al., 2018 | 2604 | 0,890 | 0,518 | 1,529 | 0,673 |
| LeardMann et al., 2011 | 38883 | 0,590 | 0,395 | 0,881 | 0,010 |
| | | 0,748 | 0,629 | 0,889 | 0,001 |



Exercise as medicine for depressive symptoms? A systematic review and meta-analysis with meta-regression

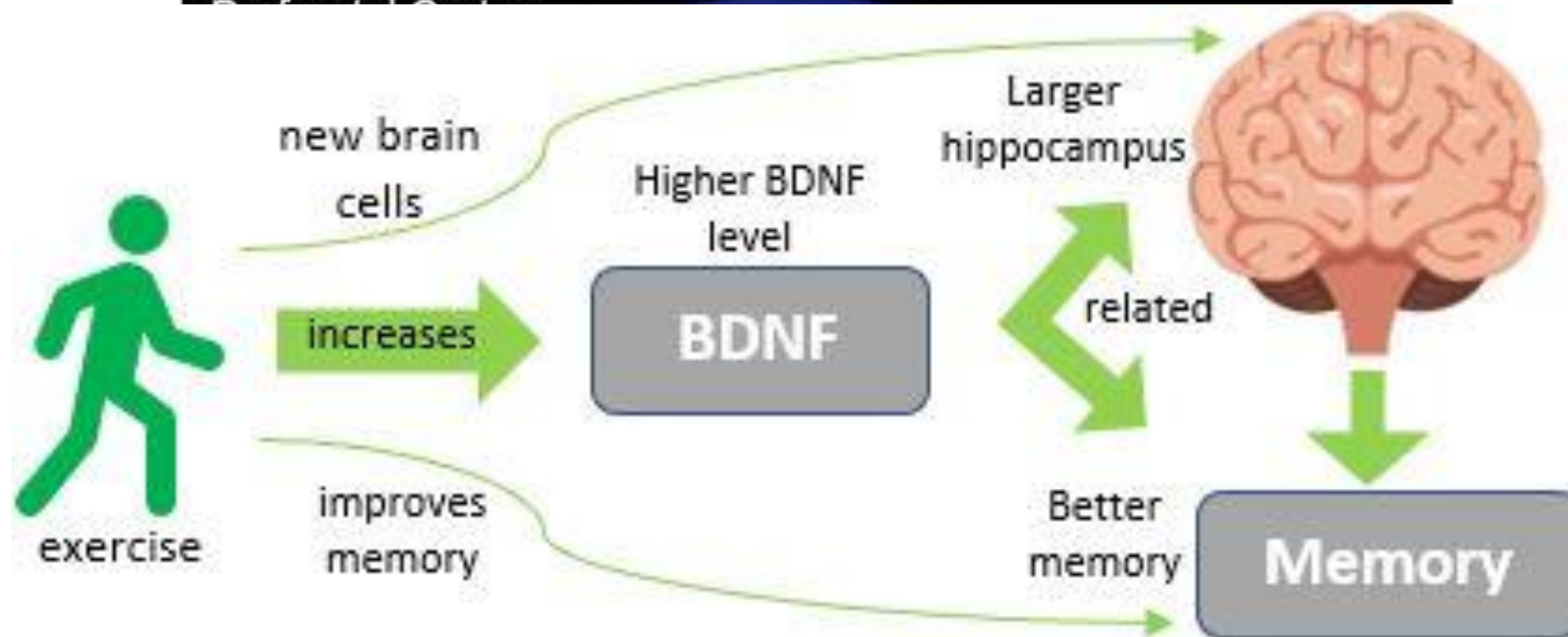
Heissel A, Heinen D, Brokmeier LL, Skarabis N, Kangas M, Vancampfort D, Stubbs B, Firth J, et al. **(2023)**

WHAT ARE THE NEW FINDINGS?

- This methodologically sound systematic review and meta-analysis with meta-regression is the largest synthesis of the effect of exercise on major depressive disorder (MDD) and depressive symptoms **covering 41 included studies, accounting for 2.264 adult participants** postintervention.
- Results show **moderate to large effects of exercise on depressive symptoms** even when limiting the analysis to low risk of bias studies or only MDD, although high heterogeneity among the studies was addressed with meta-regression.
- Non-inferiority trials indicate that **exercise is non-inferior to current first line treatments**, and evidence that exercise is effective at long-term follow-ups are needed to clarify the identified evidence gaps.

Effect of aerobic exercise on hippocampal volume in humans: A systematic review and meta-analysis

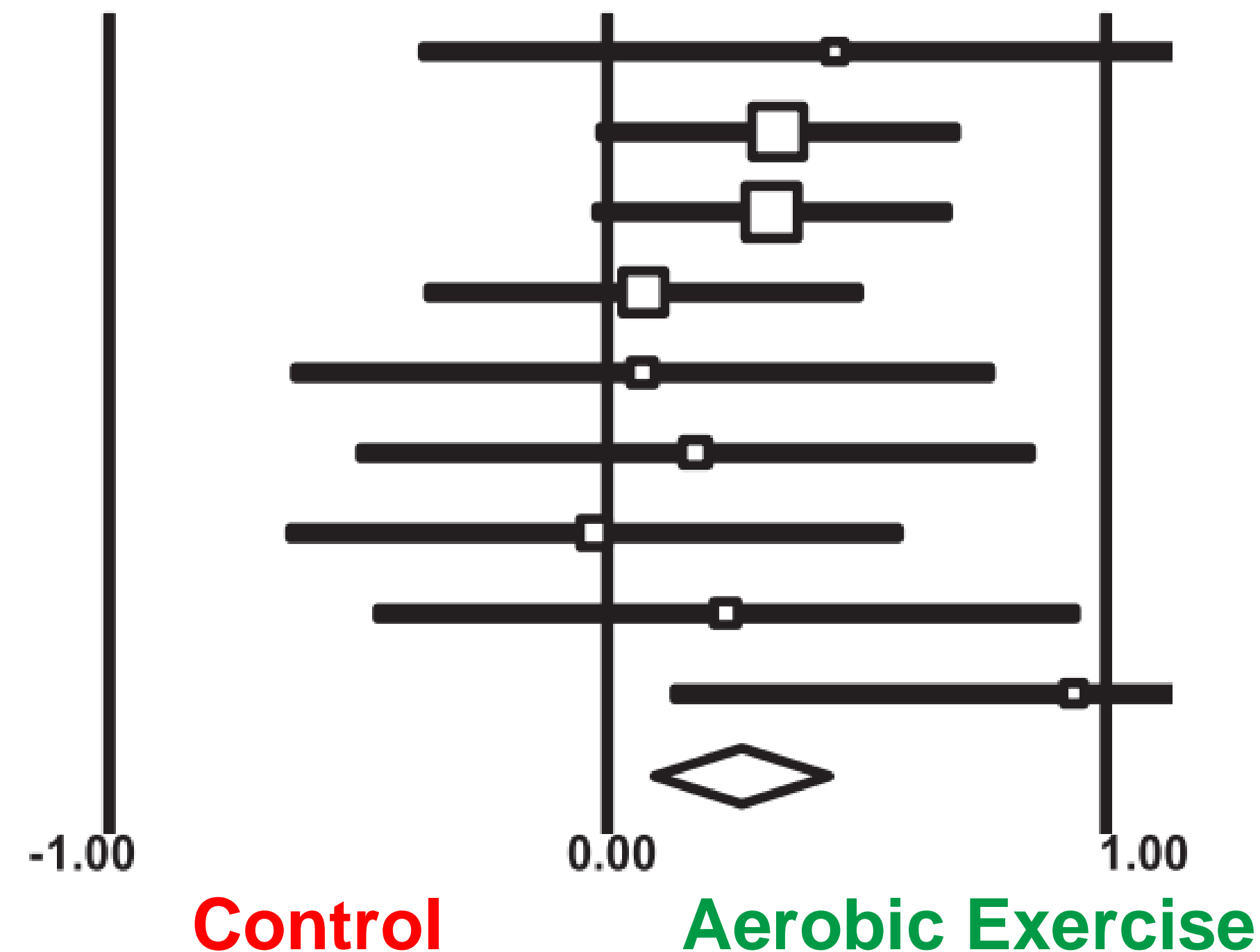
Joseph Firth^{a,b,*,1}, Brendon Stubbs^{c,d,1}, Davy Vancampfort^{e,f}, Felipe Schuch^{g,h},
Jim Lagopoulosⁱ, Simon Rosenbaum^{j,k,2}, Philip B. Ward^{j,1,2}



Effect of aerobic exercise on hippocampal volume in humans: A systematic review and meta-analysis

Joseph Firth^{a,b,*,1}, Brendon Stubbs^{c,d,1}, Davy Vancampfort^{e,f}, Felipe Schuch^{g,h}, Jim Lagopoulosⁱ, Simon Rosenbaum^{j,k,2}, Philip B. Ward^{j,l,2}

| | Hedges's g | Standard error |
|----------------------|---------------|-------------------|
| Brinke et al 2015 | 0.458 | 0.425 |
| Burzynska et al 2017 | 0.343 | 0.185 |
| Erickson et al 2011 | 0.331 | 0.183 |
| Krogh et al 2014 | 0.073 | 0.223 |
| Lin et al 2015 | 0.071 | 0.359 |
| Maas et al 2015 | 0.177 | 0.346 |
| Malchow et al 2015 | -0.026 | 0.314 |
| Niemann et al 2014 | 0.239 | 0.360 |
| Rosano et al 2016 | 0.937 | 0.411 |
| | 0.265 | 0.089 |



Effect of aerobic exercise on hippocampal volume in humans: A systematic review and meta-analysis

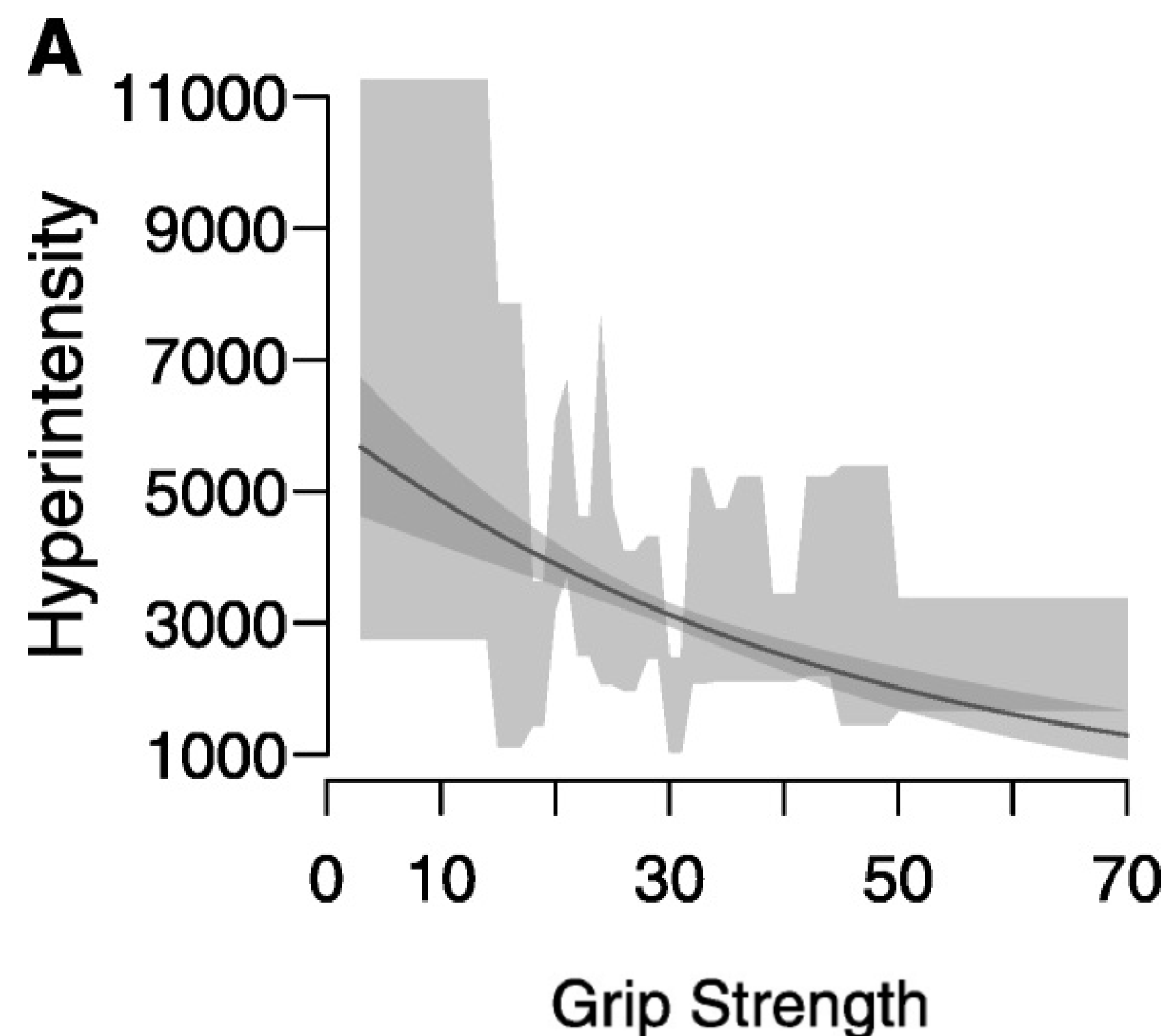
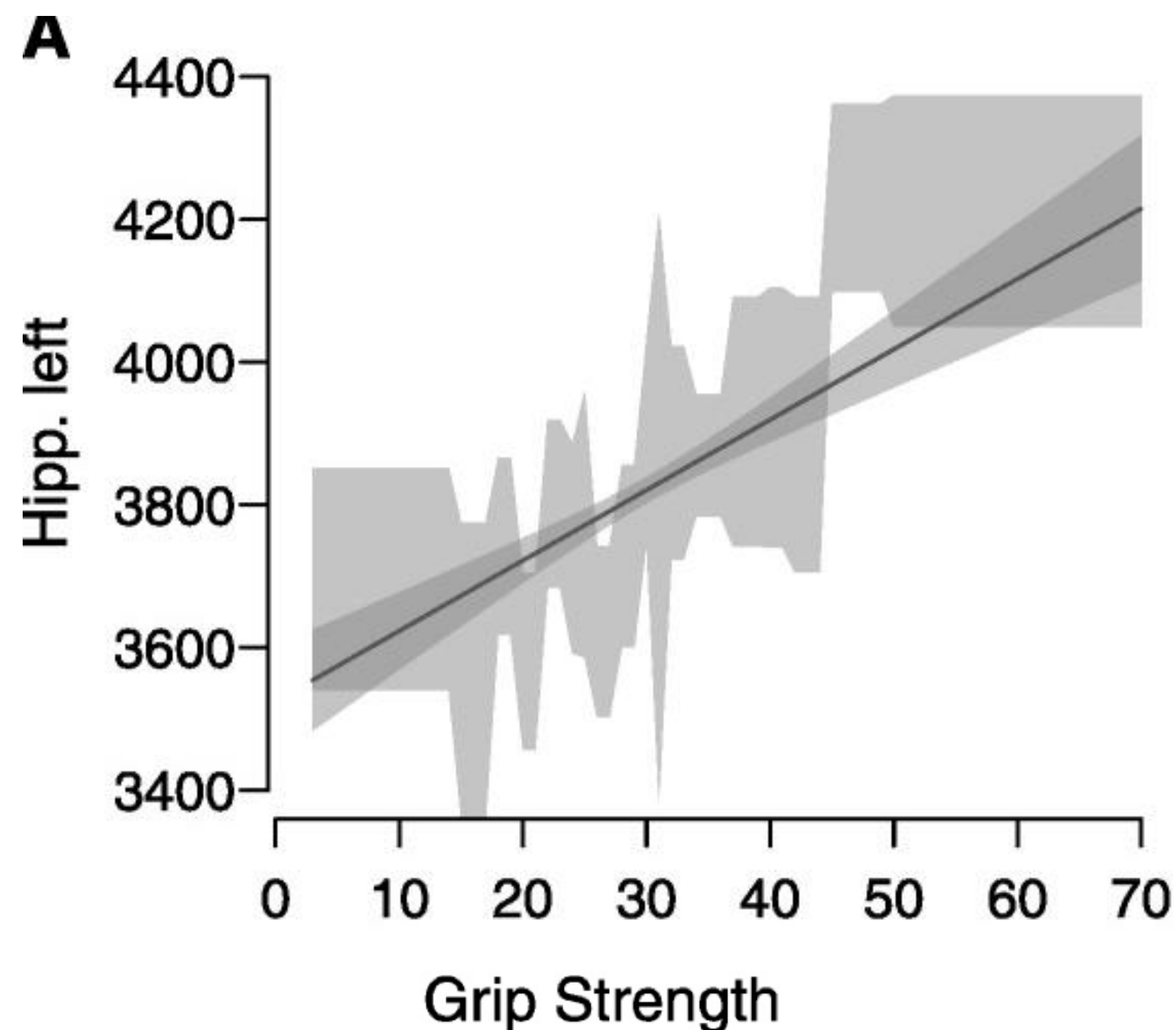
Joseph Firth^{a,b,*,1}, Brendon Stubbs^{c,d,1}, Davy Vancampfort^{e,f}, Felipe Schuch^{g,h},
Jim Lagopoulosⁱ, Simon Rosenbaum^{j,k,2}, Philip B. Ward^{j,l,2}

A B S T R A C T

Hippocampal volume increase in response to aerobic exercise has been consistently observed in animal models. However, the evidence from human studies is equivocal. We undertook a systematic review to identify all controlled trials examining the effect of aerobic exercise on the hippocampal volumes in humans, and applied meta-analytic techniques to determine if aerobic exercise resulted in volumetric increases. We also sought to establish how volume changes differed in relation to unilateral measures of left/right hippocampal volume, and across the lifespan. A systematic search identified 4398 articles, of which 14 were eligible for inclusion in the primary analysis. A random-effects meta-analysis showed no significant effect of aerobic exercise on total hippocampal volume across the 737 participants. However, aerobic exercise had significant positive effects on left hippocampal volume in comparison to control conditions. Post-hoc analyses indicated effects were driven through exercise preventing the volumetric decreases which occur over time. These results provide meta-analytic evidence for exercise-induced volumetric retention in the left hippocampus. Aerobic exercise interventions may be useful for preventing age-related hippocampal deterioration and maintaining neuronal health.

Handgrip Strength Is Associated With Hippocampal Volume and White Matter Hyperintensities in Major Depression and Healthy Controls: A UK Biobank Study

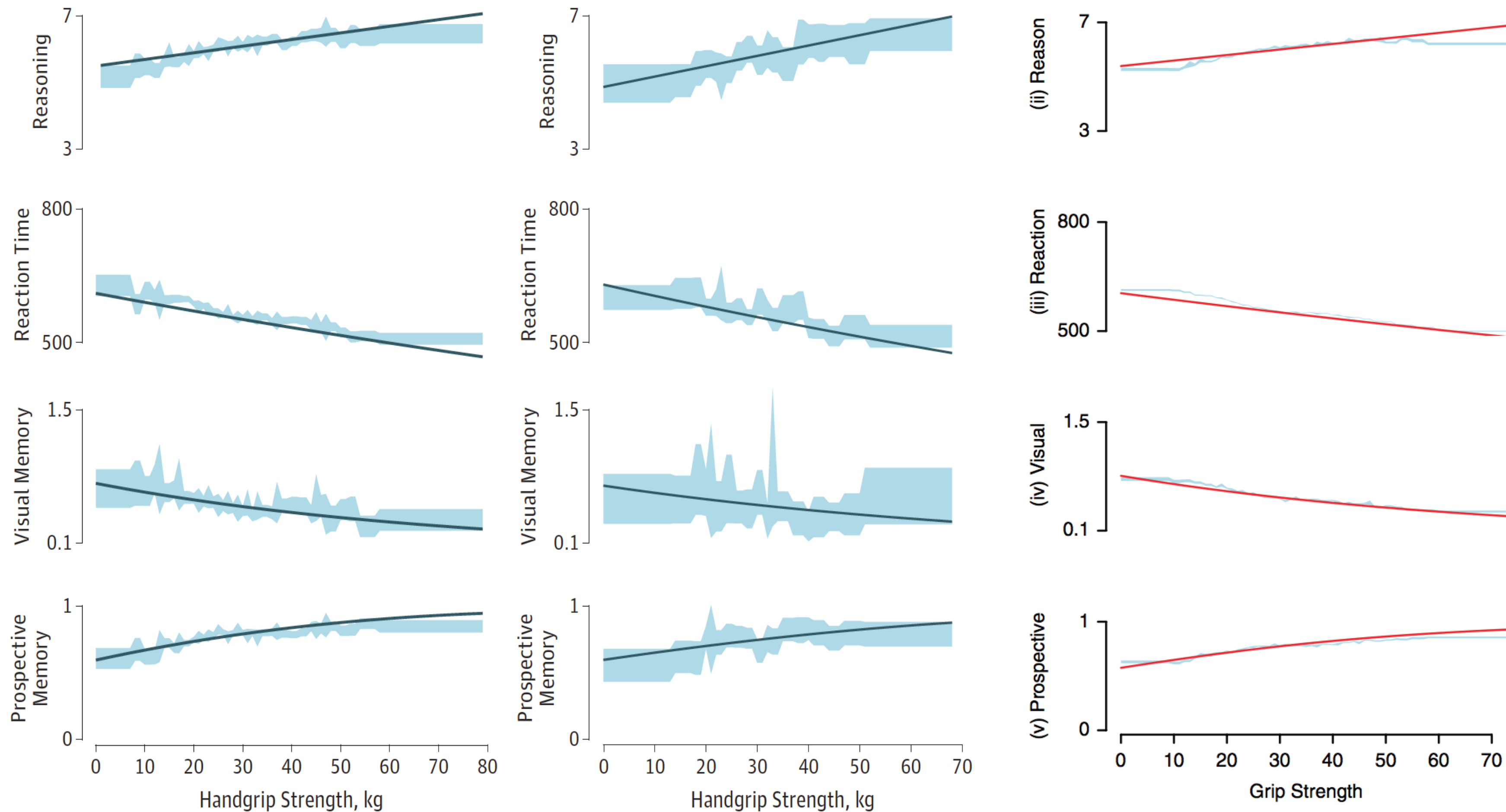
Firth, Josh A. DPhil; Smith, Lee PhD; Sarris, Jerome PhD; Vancampfort, Davy PhD; Schuch, Felipe PhD; Carvalho, Andre F. MD; Solmi, Marco MD; Yung, Alison R. MD; Stubbs, Brendon PhD; Firth, Joseph PhD



Association Between Muscular Strength and Cognition in People With Major Depression or Bipolar Disorder



Joseph Firth, PhD; Josh A. Firth, DPhil; Brendon Stubbs, PhD; Davy Vancampfort, PhD; Mats Hallgren, PhD; Nicola Veronese, MD; Alison R. Yung, MD; Jerome Sarris, PhD



A systematic review and meta-analysis of exercise interventions in schizophrenia patients

J. Firth^{1*}, J. Cotter¹, R. Elliott^{1,2}, P. French^{3,4} and A. R. Yung^{1,5}

Background. The typically poor outcomes of schizophrenia could be improved through interventions that reduce cardiometabolic risk, negative symptoms and cognitive deficits; aspects of the illness which often go untreated. The present review and meta-analysis aimed to establish the effectiveness of exercise for improving both physical and mental health outcomes in schizophrenia patients.

Method. We conducted a systematic literature search to identify all studies that examined the physical or mental effects of exercise interventions in non-affective psychotic disorders. Of 1581 references, 20 eligible studies were identified. Data on study design, sample characteristics, outcomes and feasibility were extracted from all studies and systematically reviewed. Meta-analyses were also conducted on the physical and mental health outcomes of randomized controlled trials.

Results. Exercise interventions had no significant effect on body mass index, but can improve physical fitness and other cardiometabolic risk factors. Psychiatric symptoms were significantly reduced by interventions using around 90 min of moderate-to-vigorous exercise per week (standardized mean difference: 0.72, 95% confidence interval –1.14 to –0.29). This amount of exercise was also reported to significantly improve functioning, co-morbid disorders and neurocognition.

Aerobic Exercise Improves Cognitive Functioning in People With Schizophrenia: A Systematic Review and Meta-Analysis

Joseph Firth^{*,1,13}, Brendon Stubbs^{2,3,13}, Simon Rosenbaum⁴, Davy Vancampfort^{5,6}, Berend Malchow⁷, Felipe Schuch⁸, Rebecca Elliott^{1,9}, Keith H. Nuechterlein^{10,11}, and Alison R. Yung^{1,12}

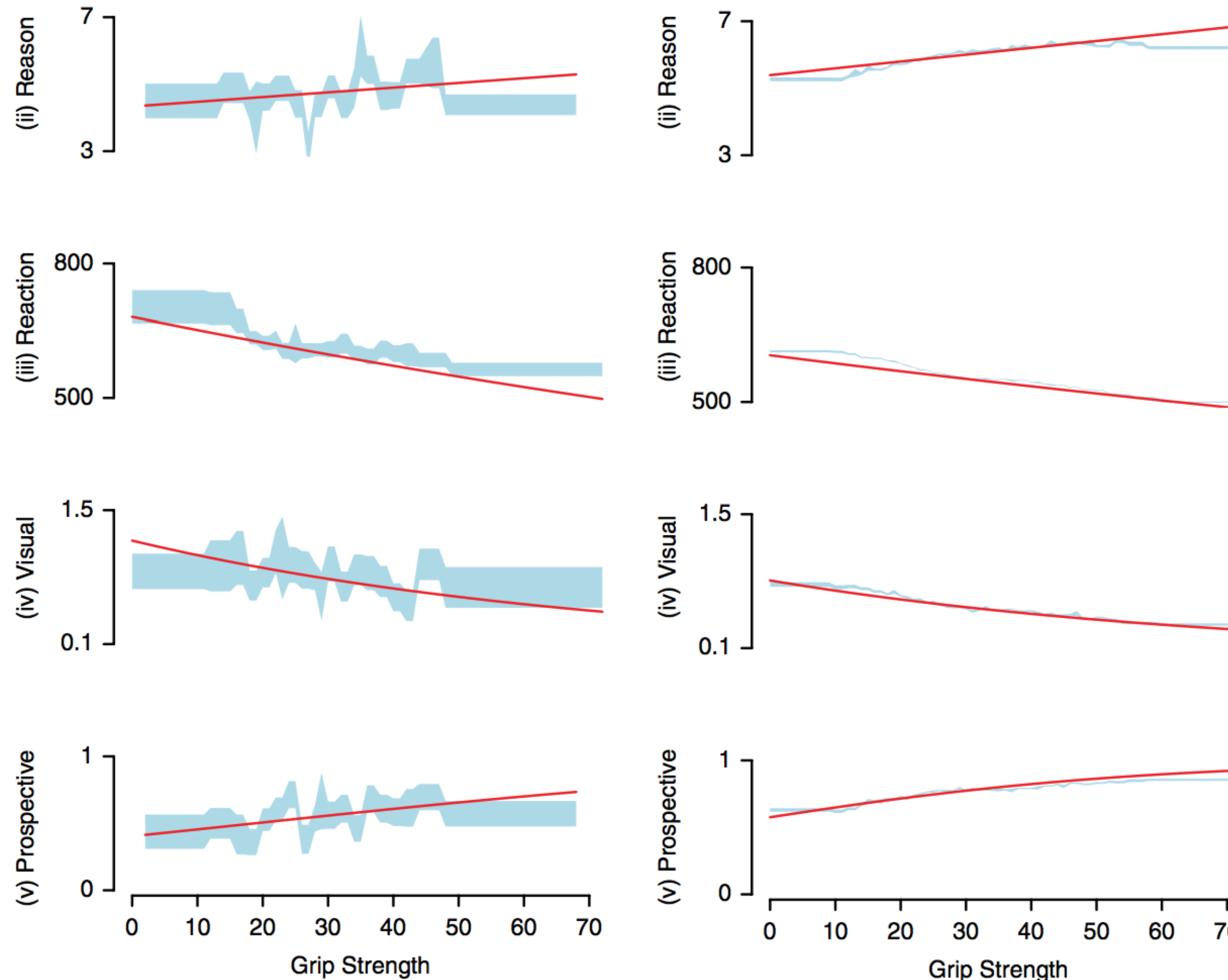
Cognitive deficits are pervasive among people with schizophrenia and treatment options are limited. There has been an increased interest in the neurocognitive benefits of exercise, but a comprehensive evaluation of studies to date is lacking. We therefore conducted a meta-analysis of all controlled trials investigating the cognitive outcomes of exercise interventions in schizophrenia. Studies were identified from a systematic search across major electronic databases from inception to April 2016. Meta-analyses were used to calculate pooled effect sizes (Hedges g) and 95% CIs.

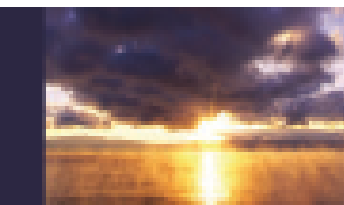
We identified 10 eligible trials with cognitive outcome data for 385 patients with schizophrenia. Exercise significantly improved global cognition ($g = 0.33$, 95% CI = 0.13-0.53, $P = .001$) with no statistical heterogeneity ($I^2 = 0\%$). The effect size in the 7 studies which were randomized controlled trials was $g = 0.43$ ($P < .001$). Meta-regression analyses indicated that greater amounts of exercise are associated with larger improvements in global cognition ($\beta = .005$, $P = .065$). Interventions which were supervised by physical activity professionals were also more effective ($g = 0.47$, $P < .001$).

Exercise significantly improved the cognitive domains of working memory ($g = 0.39$, $P = .024$, $N = 7$, $n = 282$), social cognition ($g = 0.71$, $P = .002$, $N = 3$, $n = 81$), and attention/vigilance ($g = 0.66$, $P =$

Grip Strength Is Associated With Cognitive Performance in Schizophrenia and the General Population: A UK Biobank Study of 476 559 Participants

Joseph Firth^{*,1,2}, Brendon Stubbs^{3,4}, Davy Vancampfort^{5,6}, Josh A. Firth^{7,8}, Matthew Large^{9,10}, Simon Rosenbaum^{10,11}, Mats Hallgren¹², Philip B. Ward^{10,13}, Jerome Sarris^{1,14}, and Alison R. Yung^{2,15}





Exercise as an intervention for first-episode psychosis: a feasibility study

Joseph Firth,¹ Rebekah Carney,¹ Rebecca Elliott,^{1,2} Paul French,^{3,4} Sophie Parker,^{3,5} Rebecca McIntyre,⁶ Jamie S. McPhee⁷ and Alison R. Yung^{1,3}

Abstract

Aim: Exercise can improve psychiatric symptoms, neurocognitive functioning and physical health in schizophrenia. However, the effects in early psychosis have not been explored. This study aimed to assess the feasibility of an exercise intervention for early psychosis and to determine if it was associated with changes in physical and mental health.

Methods: Thirty-one patients with first-episode psychosis (FEP) were recruited from early intervention services to a 10-week exercise intervention. The intervention group received individualized training programmes, aiming to achieve ≥ 90 min

Results: Rates of consent and retention in the exercise group were 94% and 81%, respectively. Participants achieved an average of 107 min of moderate-to-vigorous exercise per week. Positive and Negative Syndrome Scale total scores reduced by 13.3 points after 10 weeks of exercise, which was significantly greater than the treatment as usual comparison group ($P=0.010$). The greatest differences were observed in negative symptoms, which reduced by 33% in the intervention group ($P=0.013$). Significant improvements were also observed in psychosocial functioning and verbal short-term memory. Increases in cardiovascular fitness and processing speed were positively associated with the amounts of exercise achieved by participants.

¹Institute of Brain, Behaviour and Mental Health, ²Manchester Academic Health Sciences Centre, ⁵School of Psychological Sciences, University of Manchester,

³Greater Manchester West NHS Mental Health Foundation Trust, ⁷School of Healthcare Science, Manchester Metropolitan University, Manchester,

⁴Department of Psychological Sciences, The University of Liverpool, Liverpool, and

⁶Lincolnshire Partnership NHS Foundation

ARTICLE OPEN

Aerobic exercise and yoga improve neurocognitive function in women with early psychosis

Jingxia Lin¹, Sherry KW Chan¹, Edwin HM Lee¹, Wing Chung Chang¹, Michael Tse², Wayne Weizhong Su³, Pak Sham¹, Christy LM Hui¹, Glen Joe², Cecilia LW Chan⁴, PL Khong⁵, Kwok Fai So⁶, William G Honer³ and Eric YH Chen¹

Impairments of attention and memory are evident in early psychosis, and are associated with functional disability. In a group of stable, medicated women patients, we aimed to determine whether participating in aerobic exercise or yoga improved cognitive impairments and clinical symptoms. A total of 140 female patients were recruited, and 124 received the allocated intervention in a randomized controlled study of 12 weeks of yoga or aerobic exercise compared with a waitlist group. The primary outcomes were cognitive functions including memory and attention. Secondary outcome measures were the severity of psychotic symptoms, and hippocampal volume. Data from 124 patients were included in the final analysis based on the principle. Both yoga and aerobic exercise groups demonstrated significant improvements in working memory (moderate to large effect sizes compared with the waitlist control group. The yoga group showed additional benefits in memory acquisition ($P < 0.01$) and attention ($P = 0.01$). Both types of exercise improved overall and depressive symptoms.

Exercise effects on cognitive functioning in young adults with first-episode psychosis: FitForLife

Published online by Cambridge University Press: 06 May 2018

Mats Hallgren, Maria Skott, Örjan Ekblom, Joseph Firth, Adrian Schembri and Yvonne Forsell

Show author details

Article Figures Supplementary materials Metrics

Participants exercised on average 13.5 (s.d. = 11.7) times. Forty-eight percent completed 12 or more sessions. Significant post-intervention improvements were seen for speed, visual learning, and visual attention; all with moderate effect sizes ($g = 0.3$, $P < 0.05$). Exercise participation was also associated with a positive non-significant




Psychological Medicine

Article
contents

Aerobic exercise enhances cognitive function in first-episode schizophrenia: randomized controlled trial demonstrates cognitive and functional improvements

Published online by Cambridge University Press: 08 August 2022

Keith H. Nuechterlein , Sarah C. McEwen, Joseph Ventura, Keith H. Nuechterlein, Michael Boucher, Laurie R. Casaus, Margaret G. Distler and Jacquelynne E. Gruber

Article Figures Supplementary materials Metrics

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SCHIZOPHRENIA BULLETIN

The Journal of Psychoses and Related Disorders



UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE

MPRC
Maryland Psychiatric Research Center

Exercise Intervention in Individuals at Clinical High Risk for Psychosis: Benefits to Fitness, Symptoms, Hippocampal Volumes, and Functional Connectivity

Get access >

Katherine S F Damme , Tina Gupta, Ivanka Ristanovic, David Kimhy, Angela D Bryan, Vijay A Mittal

Schizophrenia Bulletin, Volume 48, Issue 6, November 2022, Pages

RESEARCH ARTICLE

Open Access



The effects and determinants of exercise participation in first-episode psychosis: a qualitative study

Joseph Firth^{1*}, Rebekah Carney¹, Lauren Jerome¹, Rebecca Elliott^{1,2}, Paul French^{3,4} and Alison R. Yung^{1,3}

Abstract

Background: Previous qualitative studies have found that exercise may facilitate symptomatic and functional recovery in people with long-term schizophrenia. This study examined the perceived effects of exercise as experienced by people in the early stages of psychosis, and explored which aspects of an exercise intervention facilitated or hindered their engagement.

Methods: Nineteen semi-structured interviews were conducted with early intervention service users who had participated in a 10-week exercise intervention. Interviews discussed people's incentives and barriers to exercise, short- and long-term effects, and opinions on optimal interventions. A thematic analysis was applied to determine the prevailing themes.

Results: The intervention was perceived as beneficial and engaging for participants. The main themes were (a) exercise alleviating psychiatric symptoms, (b) improved self-perceptions following exercise, and (c) factors determining exercise participation, with three respective sub-themes for each.

Conclusions: Participants explained how exercise had improved their mental health, improved their confidence and given them a sense of achievement. Autonomy and social support were identified as critical factors for effectively engaging people with first-episode psychosis in moderate-to-vigorous exercise. Implementing such programs in early intervention services may lead to better physical health, symptom management and social functioning among service users.

MOTIVATION

“It made me more motivated.”

“Before I was lazy and couldn’t be bothered doing things.
But now I’m more active and I just want to go out there”

“I feel a lot more energetic”

RECOVERY

“Its made me feel a lot more confident, to be like independent as well afterwards”

“If you can learn and do things in the gym, then you can do it anywhere outside... And it definitely improves your lifestyle.”

“A lot of people don’t understand how much exercise helps. But if I didn’t do exercise I’d be in a lot worse place than what I am right now”

EPA guidance on physical activity as a treatment for severe mental illness: a meta-review of the evidence and Position Statement from the European Psychiatric Association (EPA), supported by the International Organization of Physical Therapists in Mental Health (IOPTMH)



Brendon Stubbs^{a,b,*}, Davy Vancampfort^c, Mats Hallgren^d, Joseph Firth^{e,f},
Nicola Veronese^g, Marco Solmi^h, Serge Brand^{i,j,k}, Joachim Cordes^l, Berend Malchow^m,

Major Depressive Disorders

- Improves Fitness
- Improves Quality of Life
- Reduces Symptoms

Psychotic Disorders

- Improves Fitness
- Improves Cognition
- Reduces Symptoms




For all SMI, available evidence shows that Exercise:

(a) is Safe, and

(b) Works best when delivered by fitness professional



World Health Organization 2020 guidelines on physical activity and sedentary behaviour

 Fiona C Bull^{1, 2}, Salih S Al-Ansari³, Stuart Biddle⁴, Katja Borodulin^{5, 6},  Matthew P Buman⁷, Greet Cardon⁸, Catherine Carty^{9, 10},  Jean-Philippe Chaput¹¹,  Sebastien Chastin¹², Roger Chou¹³, Paddy C Dempsey^{14, 15}, Loretta DiPietro¹⁶,  Ulf Ekelund^{17, 18}, Joseph Firth¹⁹, et al.

People living with chronic conditions or disability

DISABILITIES

- Major clinical depression
- Intellectual disability
- Parkinson's disease
- A history of stroke
- Spinal cord injury
- Multiple sclerosis
- Schizophrenia
- ADHD


CHRONIC CONDITIONS

- Cancer survivors
- People living with hypertension
- People living with type-2 diabetes
- People living with HIV



World Health Organization 2020 guidelines on physical activity and sedentary behaviour



 Fiona C Bull^{1, 2}, Salih S Al-Ansari³, Stuart Biddle⁴, Katja Borodulin^{5, 6},  Matthew P Buman⁷, Greet Cardon⁸, Catherine Carty^{9, 10},  Jean-Philippe Chaput¹¹,  Sebastien Chastin¹², Roger Chou¹³, Paddy C Dempsey^{14, 15}, Loretta DiPietro¹⁶,  Ulf Ekelund^{17, 18}, Joseph Firth¹⁹, et al.

“EVERY MOVE MATTERS”

1. Physical activity is good for hearts, bodies and minds.



Adults and older adults

150-300 min/week of moderate or **75-150 min/week** of vigorous physical activity, plus **2 days/week** of muscle-strengthening activities.

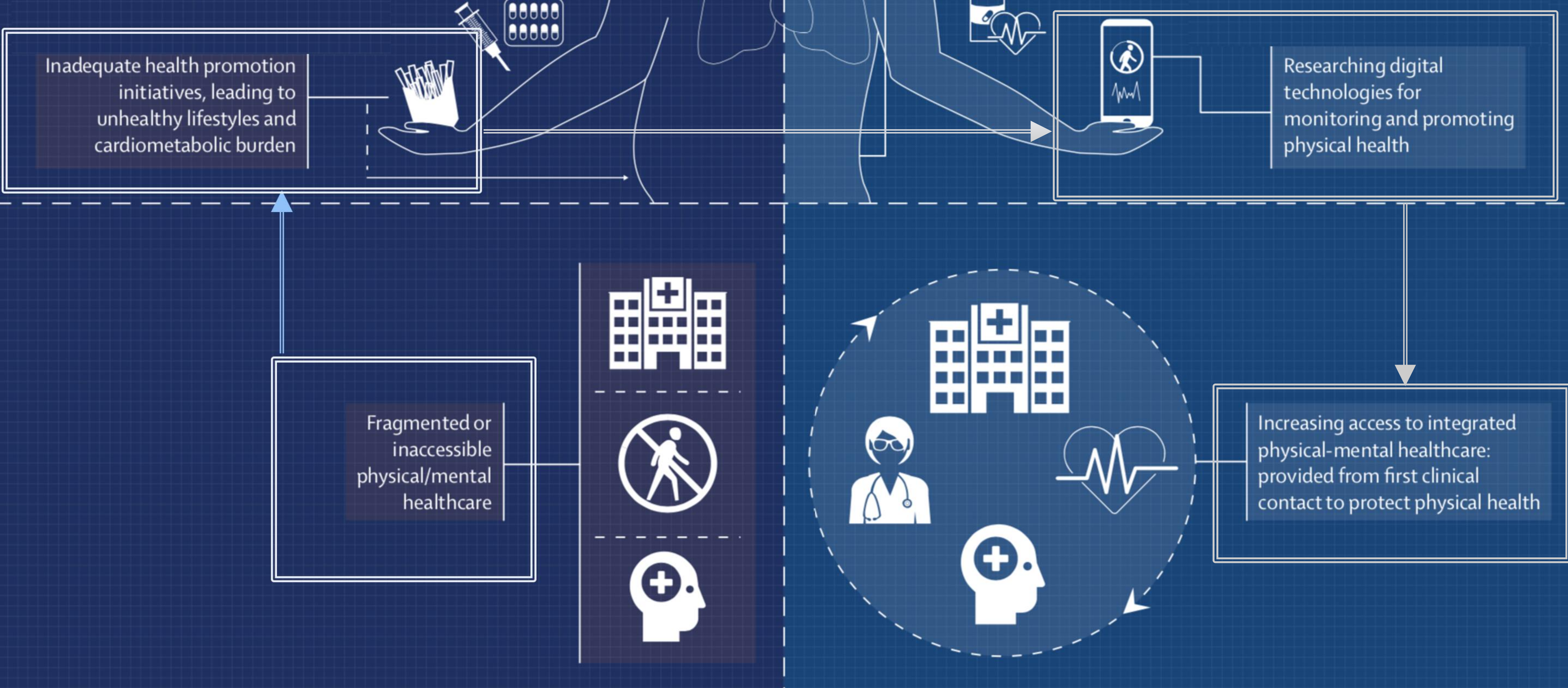


The *Lancet Psychiatry* Commission: a blueprint for protecting physical health in people with mental illness

[Joseph Firth, PhD](#)   • [Najma Siddiqi, PhD](#) ^{*} • [Ai Koyanagi, MD](#) ^{*} • [Dan Siskind, PhD](#) ^{*} • [Simon Rosenbaum, PhD](#) ^{*} • [Prof Cherrie Galletly, MD](#) ^{*} • [Stephanie Allan, MA](#) • [Constanza Caneo, MD](#) • [Rebekah Carney, PhD](#) • [Prof Andre F Carvalho, MD](#) • [Mary Lou Chatterton, PharmD](#) • [Prof Christoph U Correll, MD](#) • [Prof Jackie Curtis, MBBS](#) • [Fiona Gaughran, MD](#) • [Adrian Heald, DM](#) • [Erin Hoare, PhD](#) • [Sarah E Jackson, PhD](#) • [Prof Steve Kisely, DMedRes](#) • [Prof Karina Lovell, PhD](#) • [Prof Mario Maj, MD](#) • [Prof Patrick D McGorry, MD](#) • [Prof Cathrine Mihalopoulos, PhD](#) • [Hannah Myles, MBBS](#) • [Brian O'Donoghue, PhD](#) • [Toby Pillinger, MRCP](#) • [Prof Jerome Sarris, PhD](#) • [Prof Felipe B Schuch, PhD](#) • [David Shiers, MBChB](#) • [Lee Smith, PhD](#) • [Marco Solmi, MD](#) • [Shuichi Suetani, MD](#) • [Johanna Taylor, PhD](#) • [Scott B Teasdale, PhD](#) • [Prof Graham Thornicroft, PhD](#) • [John Torous, MD](#) • [Prof Tim Usherwood, MD](#) • [Prof Davy Vancampfort, PhD](#) • [Nicola Veronese, MD](#) • [Prof Philip B Ward, PhD](#) • [Prof Alison R Yung, MD](#) • [Prof Eoin Killackey, DPsych](#) [†] • [Brendon Stubbs, PhD](#) [†]

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Live Fitness Classes for People in Early Intervention Services

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for a study on home fitness classes, conducted online



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⇒ 4 videos

5 Minute Boxing

View full playlist

10 MINUTE BOXING

WATCH NOW

MIND & BODY

⇒ 4 videos

10 Minute Boxing

View full playlist

5 MINUTE STRENGTH

WATCH NOW

STRENGTH FOR BODY & MIND

⇒ 8 videos

5 Minute Workouts

View full playlist

🔴 Shorts

Side Plank:

Boxing Stance:

Front snap Kick:

two, one. One, so go kick,

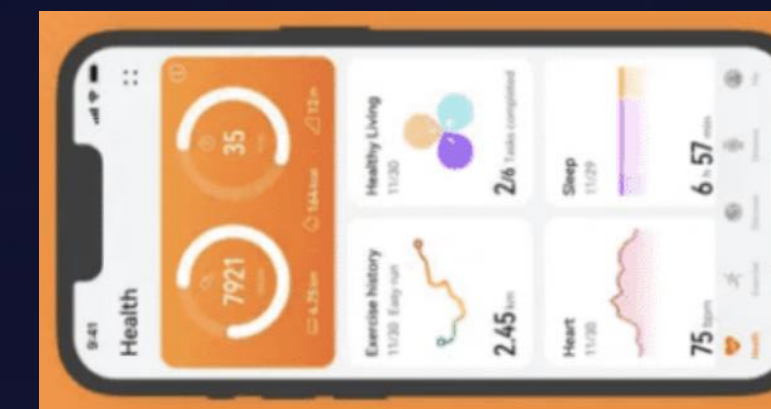
Boxing Stance:

Side Plank:

Tap left. Now you want to do

How to jab:

A big breath out as you extend that hand out,



joseph.firth@manchester.ac.uk