III INTERNATIONAL CONGRESS "PROMOTING BRAIN HEALTH THROUGH EXERCISE ACROSS THE LIFESPAN"



GRANADA 7TH–9TH OCTOBER 2026

PROGRAM AND ABSTRACTS BOOK

PROGRAM

Wed, 7th October

Time	Talk / Event	Speaker / Organizer	Chair
15:00-15:30	**Registration**		
15:30-16:20	**Workshop about patient and public involvement in research (PPI)**	Francesca Arosio and Mario Possenti from Alzheimer Italia	
16:20-16:45	**Coffe break and speaker interaction**		
16:45-17:30	**Workshop about sex- and gender-based analyses in research**	Cindy K. Barha and Sol Vidal-Almela	

Thu, 8th October

Time	Talk / Event	Speaker / Organizer	Chair
08:00-09:00	**Registration**		
09:00-09:30	**Opening**		
	Dr. Pedro Mercado. Rector of the University of Granada, Spain		
	Dr. Irene Esteban-Cornejo. University of Granada, Spain		
	Dr. Kirk Erickson. AdventHealth Research Institute, Neuroscience Institute, USA		
09:30-10:20	**Brain Health Services for the prevention of dementia: The Next Generation Memory Clinics**	Dr. Federica Ribaldi	Dr. Ryan Dougherty
10:20-11:00	**Selected Oral Communications 1**		Dr. Isabel Martín-Fuentes
	Resistance Exercise Effects on Brain Aging: Secondary Analysis of a Randomized Clinical Trial	Nárlon C. Boa Sorte Silva	**O01**
	Effects of 24-week resistance exercise on cerebral blood flow in older adults: Preliminary results from the AGUEDA Randomized Controlled Trial	Lucía Sánchez-Aranda	**O02**
	pTau217 levels moderate exercise-related changes in cortical thickness and volume: results from IGNITE	Patricio Solis-Urra	**O03**
11:00-11:25	**Poster exhibition**		
11:25-11:50	**Coffee break**		
11:50-12:40	**Understanding how exercise protects the brain – One cell at a time**	Dr. Christiane Wrann	Dr. Jose Luis Trejo
12:40-13:30	**Advancing tailored exercise interventions for dementia prevention: Updates from the TEIDe Consortium**	Drs. Elisabeth Wenger, Dr. Barbara Ukropcova, Dr. Irene Esteban-Cornejo, Dr. Rita Wissa & Dr. María Rodríguez-Ayllón	Dr. Kirk Erickson
13:30-15:00	**Lunch break**		
15:00-15:50	**Effects of acute and chronic moderate intensity aerobic exercise on brain network functional connectivity in older adults: results of the BrainEXTEND trial**	Dr. Michelle Voss	Dr. Lauren Oberlin

Time	Talk / Event	Speaker / Organizer	Chair
15:50-16:30	**Selected Oral Communications 2**		Dr. Patricio Solis-Urra
	24-Hour Movement Behaviour Profiles and Cognition in Middle-Aged and Older Adults: A Cross-Sectional Analysis of the Canadian Longitudinal Study on Aging	Guilherme Moraes Balbim	**O04**
	Take a Walk With Your Brain: A Randomized Controlled Trial Comparing Cognitive Effects of a Cognitively Enriched Walking Program versus Walking-Only and Control in Community-Dwelling Older Adults	Jannique van Uffelen	**O05**
	Objectively Measured Cardiorespiratory Fitness as a Potential Biomarker for Alzheimer's Disease Risk in Older Adults: Evidence from the Generation 100 Study	Daniel Estil Brissach	**O06**
16:30-17:00	**Coffee break - poster exhibition**		
17:00-17:50	**Effects of Exercise on Markers of Brain Health: Emerging Findings from IGNITE**	Dr. Kirk Erickson	Dr. Irene Esteban-Cornejo
20:00	**Walking tour + Tapas. Meeting point: 8 p.m. at Plaza Nueva**		

Fri, 9th October

Time	Talk / Event	Speaker / Organizer	Chair
09:00-09:50	**Designing exercise to benefit cognition during development**	Dr. Sebastian Ludyga	Dr. Francisco Ortega
09:50-10:40	**Selected Oral Communications 3**		Dr. Sebastian Ludyga
	Not all movement behaviours equally: differential associations of 24-hour movement behaviours with mental health in Swedish preschool children. A compositional data analysis from the CAP Project	Andrea Rodriguez-Solana	**O07**
	Childhood Adversity and Physical Activity Interact to Shape White Matter Microstructure in Thalamo-Occipital and Posterior Callosal Pathways	Lemye Zehirlioglu	**O08**
	Effects of Different Types of School-Based Physical Activity Interventions on Executive Function, EEG Activity, and Mental Fatigue in Adolescents: The MENTALFIT Study	Tomás García Calvo	**O09**
	Aerobic training induces frequency-specific reorganization of directed brain networks	Tomasz S. Ligeza	**O10**
10:40-11:05	**Poster exhibition**		
11:05-11:30	**Coffe break**		
11:30-12:20	**Exercising for brain health: Role of sex and menopause**	Dr. Cindy K. Barha	Dr. Sol Vidal-Almela
12:20-13:10	**Selected Oral Communications 4**		Dr. Angel Toval
	Beyond the Built Environment: Neighborhood Deprivation and Brain Structure are Linked through Sedentary Behavior in Older Adults at Risk for Dementia	Carmen-Maria Colceriu	**O11**
	The (cost-)effectiveness of exercise therapy adjunct to guideline-concordant care for depression: A pragmatic randomised controlled trial	Michele Schmitter	**O12**
	Multidomain indicators of response to remote lifestyle-based rehabilitation after chronic stroke: integrated findings from the MindFit trial	Maria Mataro	**O13**
	Effects of HIIT-based interventions on Alzheimer´s Disease plasma biomarkers in people living with cardiovascular disease	Marcos Olvera-Rojas	**O14**

Time	Talk / Event	Speaker / Organizer	Chair
13:10-14:40	**Lunch break**		
14:40-15:30	**Exercise as medicine for Mild Cognitive Impairment: Understanding the type of exercise and for whom**	Dr. Teresa Liu-Ambrose	Dr. Michelle Voss
15:30-16:20	**Exercise, fitness and brain health in individuals with cardiovascular diseases**	Dr. Francisco Ortega	Dr. Teresa Liu-Ambrose
16:20-17:00	**Closing ceremony** *Dr. Kirk Erickson. AdventHealth Research Institute, Neuroscience Institute, USA* *Dr. Irene Esteban-Cornejo. University of Granada, Spain* *Dr. Lauren Oberlin. AdventHealth Research Institute, Neuroscience Institute, USA* *Dr. Sol Vidal-Almela. University of Granada, Spain*		
20:00	**Conference dinner. 8 p.m at Hotel Vincci Albayzín (not included in the registration fee)**		

List of Posters

Title	Corresponding author	Panel
Immediate exercise-type-specific plasma proteomic and Alzheimer's disease biomarker responses: preliminary findings from the flADex crossover trial	Isabel Martín-Fuentes	**IDa003**
Lifestyle and physiological health shape brain fog during the menopausal transition	Flaminia Ronca	**IDa004**
Physical Fitness as Predictor of Affective Health in Middle-Aged Women with Psychological Distress: The Exer-WAPA Project	Luis Mariano Arcediano-Consuegra	**IDa005**
Anterior Midcingulate Cortex Volume and Cognitive Performance in Aging: Independence from Fitness and Alzheimer's Disease Biomarkers	Michelle Villarroel	**IDa006**
HIIT and HIIT plus Resistance Training on Cerebral Blood Flow in Individuals with Coronary Artery Disease: Preliminary Findings from The Heart-Brain Randomized Controlled Trial	Angel Toval	**IDa008**
Associations of Muscular Strength with Anxiety Symptoms in Familial Hypercholesterolemia: Preliminary Analyses from the UPPA-FH Study	María José Martín Jáimez	**IDa009**
Domain-specific physical activity and Alzheimer's disease blood-based biomarkers in cognitively normal older adults: preliminary cross-sectional analysis from the AGUEDA trial	Rocio Izquierdo-Gomez	**IDa010**
The association between sedentary behaviour and cognitive performance depends on muscle power	Veronica Mihaiescu-Ion	**IDa011**
Exploring the Role of Cardiac Autonomic Modulation, Cardiorespiratory Fitness, and Sleep Quality in Psychological Distress: The Exer-WAPA Study in Middle-Aged Women.	Jaime Lebrón-Roldán	**IDa012**
Association between dietary patterns and biomarkers of Alzheimer's disease in cognitively normal adults: preliminary findings from AGUEDA trial	María Gabriela	**IDa014**
Associations Between Physical Fitness Components and Regional Cortical Thickness in University Students	Neus Camins-Vila	**IDa015**
Associations between Life's Essential 8 and white matter integrity in cognitively normal older adults from the AGUEDA trial.	María Teresa Rodríguez Palacios	**IDa016**
Can Physical Exercise boost Digital Literacy Learning in Older Adults: A pilot study	Diego Pastor	**IDa017**
Effects of a 12-Week Cardiac Rehabilitation Program on Stroop Performance in Patients with Coronary Artery Disease.	Ana Sanz Rocher	**IDa018**

Title	Corresponding author	Panel
Physical Activity and All-Cause Mortality by Depression and Treatment Status: data from the U.S. National Health Interview Survey	Salud Pintos-Carrillo	**IDa019**
Using steps to improve functional capacity, cardiovascular and brain health in adults with heart failure: design of the STEP-IN randomized controlled trial	Sol Vidal-Almela	**IDa020**
Two-decade trends in the association between physical activity and psychological distress in US adults: evidence from the National Health Interview Survey, 1998–2018.	Freddy Narváez	**IDa021**
Acute Effects of Exercise on Executive Function and Memory in Patients with Ischemic Heart Disease.	Jose Manuel Sarabia	**IDa022**
Integrating muscle function and cognition as healthspan outcomes in a multimodal lifestyle intervention for individuals with subjective cognitive decline: preliminary framework from the VITA study	Laura Forcano	**IDa023**
Efficacy of Combining Multicomponent Training with Physically Active Lifestyle Recommendations on Cognitive Function of Older Adults with Probable Mild Cognitive Impairment: MOVEMENTE Study Protocol	Nádia Bezerra	**IDa024**
Cardiorespiratory fitness supports working memory through adaptive neural recruitment in cognitively unimpaired older adults	Cristina Molina-Hidalgo	**IDa025**
Effects of resistance training on brain age and the pace of aging derived from magnetic resonance imaging: preliminary results from the AGUEDA trial.	Javier Sanchez-Martinez	**IDa027**
Exercise modulates proteins of circulating extracellular particles in the elderly at risk of accelerated cognitive decline	Nikoleta Alchus Laiferová	**IDa028**
Differential prefrontal and parietal activity in surgeon brains between conventional and robotic-assisted arthroplasty	Uzair Hakim	**IDa031**
Effects of a 24-Week Resistance Exercise Intervention on regional White Matter Hyperintensities: findings from The AGUEDA Trial	JAVIER FERNÁNDEZ-ORTEGA	**IDa032**
10-year associations between cardiorespiratory fitness and brain structures in older adults	Line Skarsem Reitlo	**IDa033**
A step-based physical activity program to enhance functional capacity and heart-brain health in patients with heart failure: design of the STEP-IN intervention.	Ana Isabel Manzano-Salcedo	**IDa035**
Interactions between physical activity and psychological distress in relation to mortality: temporal trends in US adults, 1998-2018	Miguel Angelo Duarte Junior	**IDa036**
Association of cardiovascular health with psychosocial outcomes in patients with coronary artery disease: Preliminary findings from the Heart-Brain trial	Emilio J. Barranco-Moreno	**IDa037**

Title	Corresponding author	Panel
From Daily Functioning to Life Satisfaction: The Mediating Role of Mental Health	Laura Delgado-Lobete	**IDa038**
Interaction Between Cardiorespiratory Fitness and Cognition in Heart Failure: The Moderating Role of Cerebral Pulsatility	Florent Besnier	**IDa040**
Association Between Handgrip Strength and Global Cognitive Function in Adults Aged 60 and Older: ExerMOT4Health Project	Marta Baena Aguilera	**IDa041**
Associations between physical condition parameters, working memory performance, and task-related brain activation in older adults: fMRI findings from the AGUEDA trial	Beatriz Fernandez Gamez	**IDa043**
Associations between multidimensional sleep measures and domain-specific cognitive function across repeated observations in adults aged 55 years and older	Pieter-Jan Marent	**IDa045**
Students' Perceived Attention in Fifth-Grade Classrooms that Promote Movement: The MOVI-OLE Study	Antonio Fernández-Caballero Elvira	**IDa048**
Effects of controlled breathing techniques on cognitive function in adolescents: a systematic review	Clara Gacparski Martín	**IDa049**
Changes in serum levels of GPLD1 in healthy older adults predict future risk of Alzheimer's disease	Helene Haugen Berg	**IDa050**
Plasma microRNAs distinguish preclinical Alzheimer's disease from cognitively healthy aging	Aleksi Matias Huuha	**IDa051**
Effects of a 24-week resistance exercise intervention on gray matter volume and dynamic functional connectivity in cognitively normal older adults: The AGUEDA randomized controlled trial	Andrea Coca Pulido	**IDa053**
Effects of physical exercise interventions on cognitive outcomes in children and adolescents with cancer: an umbrella review of systematic reviews with meta-analyses.	Marina Olmedo Pérez-Montaut	**IDa054**
Effects of High-Intensity Interval Training and Creatine Administration on Adult Hypothalamic Neurogenesis and Inflammation in Middle-Aged Mice	Javier Cordero Choquet de Isla	**IDa055**
From Movement Behaviors to Academic Performance: The Serial Mediating Role of Cardiorespiratory Fitness and Executive Functions	David Sánchez-Oliva	**IDa056**
Personality shapes motivation but not psychological outcomes in older adults: evidence from the PRO-Training randomized controlled trial	Óscar Martínez-de-Quel	**IDa057**
Acute Aerobic Exercise Enhances Inhibition Across Anxiety Levels with Distinct Neural Effects	Gabriela Rajtar	**IDa058**

Title	Corresponding author	Panel
Effects of different types of exercise training on intra-individual variability in cognitive performance in older adults with mild cognitive impairment	Vrinda Dimri	**IDa060**
Executive Functions in Closed- and Open-Skill Sports: Protocol for a Descriptive and Inferential Pilot Study in Competitive Youth Athletes	Leroy Donoso Usen	**IDa061**
Differences in mental health outcomes in IPVAW survivors considering hits to the head exposure	María de la Paz García-Navas Menchero	**IDa062**
Relationship between hits to the head and immune dysregulation in women exposed to intimate partner violence.	María Dolores Sánchez Rodríguez	**IDa063**
Assessing an inclusive lifestyle-based intervention program that supports individuals living with chronic neurological conditions, their care partners and healthy agers.	Alisa Hashimoto	**IDa064**
Physical Literacy and Its Relationship with Mental Health Outcomes in children and adolescents: A Systematic Review	Víctor Manuel Valle-Muñoz	**IDa065**
Sex-specific phenotypic risk clusters and the CAIDE Paradox in dementia prevention: baseline findings from CITA GO-ON	Imanol Reparaz-Escudero	**IDa066**
Ameliorating aging-associated cognitive decline by exercise: systemic integrated adaptive response.	Barbara Ukropcova	**IDa069**
The acute effects of dance on cognition and mobility in older adults: a pilot study	Nicolas Berryman	**IDa070**
Thinking while walking: Performance on executive functioning dual-tasks in adults with and without ADHD	Emily Meachon	**IDa071**
An intergenerational cognitive-physical activity program for mild cognitive impairment: cognitive, behavioural and psychosocial outcomes	Julie Latomme	**IDa072**
Cognitively enriched handball training improves executive functions and academic performance in prepubertal schoolchildren	Falonn Contreras-Osorio	**IDa074**
Determinants of cognitive decline during acute hospitalization in older adults: a longitudinal analysis	Paula Etayo-Urtasun	**IDa075**
Effects of Concurrent Exercise on Cognitive Inhibition in Adolescents	Celia Blanco Alba	**IDa076**
Evaluation of a working memory training with and without physical exercise on executive function in a military cohort	Anouk Glättli	**IDa078**
How duration and intensity of physical activity influence the association of stroke and higher-order cognition in older adults	Mateja Virovec	**IDa080**

Title	Corresponding author	Panel
Towards earlier identification of cognitive decline and its prevention through physical activity: The EMPICATExt project	Jesus Diaz-Garcia	**IDa081**
Combined physical and cognitive priming enhances subsequent cognitive performance and prefrontal oxygen saturation in Alzheimer's disease: Evidence from the EMPICAText Project	Jesus Díaz-García	**IDa082**
Influence of 24-hour movement behaviors stability on academic performance and core executive functions	Fátima Martín Acosta	**IDa083**
The Optimal Combination of Physical and Cognitive Activity in Older Adults to Promote Cognitive Functioning	Lenka Leenknegt	**IDa084**
Correlates of Psychological Distress and Cognitive Function in Young Adults: Exploratory Findings from a Pilot Randomized Controlled Trial	Samira Rostami	**IDa085**
The Impact of Movement Breaks on University Students' Cognitive Performance and Well-being: A Systematic Review	Marit Salus	**IDa086**
Delayed Improvements in Attention Following a Brief Active Break in Preschool Children	María Valdivieso González	**IDa087**
Physical Activity and Motor Competence in Relation to Working Memory Capacity in School-Aged Children: The Moderating Role of Preterm Birth	Anja Atesli-Schwarz	**IDa088**
Boosting positivity: Does acute aerobic exercise strengthen positive memory acquisition among healthy, inactive adults?	Renee Roosen	**IDa089**
Association of muscular fitness and irritability in children with and without mood disorders	Melanie Berger	**IDa090**
The Dynamics of Physical Activity and Affect: Investigating Memory-Based Event Appraisal as Potential Mechanism	Janna Vrijsen	**IDa091**
Effects of a multicomponent exercise program on muscle function in patients with severe mental illness: A randomized controlled trial.	Arantxa Ancín Osés	**IDa092**
Impact of a short-term exercise program on clinical symptomatology in patients with severe mental illness: A preliminary randomized controlled trial.	Rubén Auré-Sánchez	**IDa094**
Mixed-Methods Process Evaluation of Take A Walk With Your Brain, a Cognitively Enriched Walking Program for Community-Dwelling Older Adults.	Greet Cardon	**IDa095**
Associations of physical activity and sedentary time from childhood to adolescence with cognition in adolescence: The PANIC study	Petri Jalanko	**IDa097**
Muscular Strength and Executive Functions Across Youth: Age-Dependent Associations	Sarah Marie Bajer	**IDa098**

Title	Corresponding author	Panel
Effects of Group-Based and Individualized Exercise on Global Cognition and Executive Function in Older Adults: A Systematic Review	Sioban Tatara	**IDa099**
Chronic exercise induces a pathway-dependent electrophysiological signature in the mouse hippocampus[	José Luis Trejo Pérez	**IDa101**
Sex Moderates the Association Between Brain Age Gap and Gait Speed in Older Adults with Mild Cognitive Impairment	Talia Salzman	**IDa102**
Exercise-induced metaplastic windows in learning and memory	Jonathan Thacker	**IDa103**
Brain capital and lifestyle habits in Argentina: disparities by educational level	Maria de la Paz Scribano Parada	**IDa104**
24-hour movement behaviors and MRI markers of brain health in the general aging population: Results from the Rotterdam Study	Lucía Sánchez-Aranda	**IDa105**
The 24-Hour Activity Cycle, Allostatic Load, and Early Neurodegeneration in Midlife	Maya Caon	**IDa106**
Associations of Physical Activity and Sleep Quality with Preclinical Neurodegeneration in Older Adults at Risk for Alzheimer's Disease	Ronny Chow	**IDa107**
Functional connectivity of anterior insular subdivisions following the IMOVE study: an arts-based intervention in people with cognitive impairment	Ayse Uneri	**IDa108**
Active Lives, Agile Minds: Co-production and Pilot Evaluation of the Movement Inspired by Martial Arts Programme for Older Adults	Zsofia Szekeres	**IDa109**
The effects of exercise training on spatial entropy in the brain in obese older adults	Christina Hugenschmidt	**IDa110**
Effects of acute physical activity on neural correlates of working memory in children with and without ADHD: insights from the Break4Brain project	Margalida Castell Orell	**IDa111**
Associations of quadriceps function with brain structure in persons with COPD: an exploratory cross-sectional analysis	Dries Cops	**IDa112**
Moderate-Vigorous Physical Activity and Cognition in Older Adult Participants from Lifestyle Trials: Baseline De Novo Analyses from The InLife Data Harmonization Study	Shannon Halloway	**IDa113**
Associations Between Cerebral Oxygenation, ECG QT dispersion, and Cognition in Individuals with Coronary Heart Disease: A Cross-Sectional Study	Pierre Faivre	**IDa115**
Beyond Symptoms: Sex-Specific Physical, Clinical, and Cardiometabolic Health in Treatment-Resistant Major Depression	Oier López Marin	**IDa116**

Title	Corresponding author	Panel
Acute effects of physical activity and cognitive engagement on current source density during inhibitory control in children with and without ADHD	Sebastia Bibiloni-Pujol	**IDa117**
"I Became a Person Again, If That Makes Sense": A Qualitative Study of Perceived Benefits Following an Exercise Intervention in People with Treatment-Resistant Major Depression	Iker Lasa-Sagaseta	**IDa118**
Walking Energy Expenditure as a Predictor of Cognitive Impairment Risk	Ryan Dougherty	**IDa119**
Psychometric properties of the International Fitness Scale in postpartum women and its association with physical activity, depressive and anxiety symptoms: Preliminary results	Jose J. Gil-Cosano	**IDa120**
Cycling and Mental Well-being of International University Students: A Qualitative Interview Study	Ekaterina Gudozhnikova	**IDa121**
Psychosocial Pathways Linking Physical Activity to Depressive Symptoms in University Students: A Serial Mediation Study	Hongxin Huang	**IDa122**
Cognitive and academic performance in schoolchildren with and without ADHD: findings from the Break4Brain project	Jaume Gelabert	**IDa123**
Classroom movement strategies to improve to increase physical activity and to improve cognition and academic performance in school-aged population: protocol of the Break4Brain hybrid type II implementation-effectiveness trial	Diego Arenas Arroyo	**IDa125**
Patients' Perceptions of Virtual Reality as a Psychological Treatment for Depression: A Systematic Review and Thematic Synthesis	maría eugenia visier-alfonso	**IDa126**
Time spent in physical activities, TV watching and sleep and its association with executive cognitive functioning in middle age and older adults: an isotemporal substitution analysis	Nynke Smidt	**IDa127**
Beyond BMI: Deep Neck White Adiposity and Muscle Fat Infiltration are Inversely Associated with Plasma ptau217: Results from AGUEDA study.	María José and Irene Arias-Téllez and Esteban-Cornejo	**IDa128**
Exercise as a remedy: Running improves metabolic, inflammatory, and performance profiles in cafeteria diet-induced obese rats	Joanna H. Sliwowska	**IDa129**
Voluntary running improves metabolic and inflammatory profiles in Western-type diet-induced obesity in rats.	Ewa Kilańczyk	**IDa130**
Co-designing the prototype of a physical activity website (TeenFit) through a stakeholder workshop	María Rodríguez-Ayllón	**IDa131**

ABSTRACTS

Oral communication - O01

Resistance Exercise Effects on Brain Aging: Secondary Analysis of a Randomized Clinical Trial

Nárlon C. Boa Sorte Silva[1], Guilheme Moraes Balbim[2], Vrinda Dimri[2], Talia Salzman[2], Roger C. Tam[2], Ryan S. Falck[2], Teresa Liu-Ambrose[2]

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Background: Individuals with subcortical vascular cognitive impairment (SVCI) are at increased risk of dementia due to neurodegeneration secondary to cerebrovascular pathology. Brain age gaps (BAGs) quantify global neurodegenerative processes and may index accelerated brain aging in SVCI. Exercise may counteract neurodegeneration and slow brain aging. Here, we investigated the impact of resistance exercise training (RT) on BAGs in older adults with SVCI.

Methods: This 12-month, single-blind randomized clinical trial involved 89 community-dwelling older adults. Participants were randomized (1:1) to twice-weekly (60 min/session) RT (n=44) or a balance and tone (BAT; n=45) control intervention. BAGs were computed from T1-weighted MRI data processed using the Spatial Patterns of Atrophy for Recognition of Brain Age (SPARE-BA) score. BAGs were regressed on baseline age to correct for age bias. Both raw BAGs and standardized residuals were used in the analyses, with higher scores indicating greater age-related atrophy. Group differences in 12-month change in BAGs were examined using analysis of covariance, adjusting for baseline BAGs, white matter lesions, intracranial volume, sex, and education.

Results: Sixty-one participants (mean age 74.1 years; 69% female) with high-quality MRI at 12-month assessment were included in the analyses. After 12 months, SPARE-BA scores showed that RT participants had brains ~2.7 years younger than BAT participants (estimated marginal means [95% CI]: 70.46 [68.27 to 72.65] vs 73.14 [71.09 to 75.19]). This difference was statistically significant in both the standardized BAGs model (estimated mean difference [95% CI]: -2.66 [-5.23 to -0.08], P = 0.043) and raw BAGs model (-2.68 [-5.27 to -0.09], p = 0.043). Analyses using multiple imputation (n=89) showed similar, but attenuated, effect estimates of RT vs. BAT (raw BAGs: -2.50 [-5.38 to 0.37], P = 0.083; standardized BAGs: -2.61 [-5.41 to 0.20], P = 0.068).

Conclusions: Resistance exercise training may deaccelerate brain aging in older adults living with SVCI.

Oral communication - O02

Effects of 24-week resistance exercise on cerebral blood flow in older adults: Preliminary results from the AGUEDA Randomized Controlled Trial

Lucía Sánchez-Aranda[1], Angel Toval[1], Beatriz Fernandez-Gamez[1], Javier Sanchez-Martinez[1], Lauren E Oberlin[2], Francisco B Ortega[3]

[1] Department of Physical Education and Sports, Faculty of Sport Sciences, Sport and Health University Research Institute (iMUDS), University of Granada, Granada, Spain.

[2] AdventHealth Research Institute, Neuroscience, Orlando, FL, USA.

[3] Department of Physical Education and Sports, Faculty of Sport Sciences, Sport and Health University Research Institute (iMUDS), University of Granada, Granada, Spain; Centro de Investigación Biomédica en Red Fisiopatología de la Obesidad y Nutrición (CIBEROBN), Instituto de Salud Carlos III, Madrid, Spain; University of Jyväskylä, Faculty of Sport and Health Sciences, Jyväskylä, Finland.

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Background: Cerebral blood flow (CBF) decreases with age and serves as a critical early marker for dementia. Underlying cardiovascular risk factors also contribute to dementia onset. Exercise has been shown to elicit positive effects on both brain and cardiovascular health. However, the effects of resistance exercise (RE) on CBF are unexplored.

Methods: Seventy-nine cognitively normal older adults from the AGUEDA randomized controlled trial were allocated to a 24-week RE program or a control group. Multiple-delay pseudo-continuous arterial spin labelling data were used to estimate resting global gray matter (CBF-GM) and regional (hippocampus, precuneus, anterior and posterior cingulate cortex) CBF. Post-intervention between-group differences were evaluated with constrained linear mixed models, including subgroup analyses for obesity, diabetes/prediabetes, hypercholesterolemia, hypertension and accumulation of two or more cardiovascular comorbidities.

Results: No significant between-group differences were found for CBF-GM (standardized mean difference [SMD]=0.15, 95%CI:-0.21 to 0.51, P=0.41) or regional CBF (hippocampus: SMD=0.08, 95%CI:-0.27 to 0.43, P=0.65; precuneus: SMD=0.16, 95%CI:-0.19 to 0.50, P=0.39, anterior cingulate cortex: SMD=0.04, 95%CI:-0.34 to 0.42, P=0.83; posterior cingulate cortex: SMD=0.16, 95%CI:-0.19 to 0.50, P=0.36) in the whole sample. Although the intervention effect on CBF-GM appeared more pronounced in participants with higher cardiovascular risk—obesity (β=0.59, 95%CI:-0.11,1.29), diabetes/prediabetes (β=0.30; 95%CI:-0.34,0.95), hypercholesterolemia (β=0.41, 95%CI:-0.25,1.07), hypertension (β=0.19; 95%CI:-0.33,0.71), or those accumulating two or more cardiovascular comorbidities (β=0.33; 95%CI:-0.2,0.86)—the interaction effects were not statistically significant (all Pinteraction >0.05), indicating no formal moderation by baseline cardiovascular health status. Subgroup analyses were consistent across the four regions studied.

Conclusions: The RE program was not associated with changes in CBF in cognitively normal older adults. A trend toward greater intervention benefit was observed among those with poorer cardiovascular health, but it did not achieve statistical significance. Further studies, specifically in individuals with high cardiovascular risk, are warranted to clarify the effects of RE on CBF and dementia prevention.

Oral communication - O03

pTau217 levels moderate exercise-related changes in cortical thickness and volume: results from IGNITE

Patricio Solis Urra[1], Kelsey R. Sewell[2], Chaeryon Kang[3], George Grove[4], Amani Norling[5], Edward McAuley[6], Charles H. Hillman[7], Anna L. Marsland[4], Renee J. Rogers[8], Jill K Morris[9], Kirk I Erickson[10]

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Background: Exercise may attenuate age-related brain deterioration, but whether effects are regionally specific or influenced by Alzheimer's disease (AD) pathology remains unclear. We examined the effects of a 1-year exercise intervention on cortical structure in cognitively unimpaired older adults and tested whether a marker of baseline amyloid pathology moderated these effects.

Method: Data from the IGNITE study were used for this analysis. Cognitively unimpaired older adults were randomized to either 150 min/week stretching control, 150 min/week of aerobic exercise, or 225 min/week of aerobic exercise for 1 year; the current analysis combined aerobic exercise groups. T1-weighted MRI data from 489 participants with baseline and follow-up scans were processed using FreeSurfer's longitudinal stream. ptau217 was used as a marker of amyloid pathology. Surface-based longitudinal models examined annualized cortical change, adjusting for site, age, sex, COVID status, and years of education.

Results: Compared to the stretching control, exercise attenuated of cortical decline. Particularly, the combined exercise group showed less cortical thinning in the left parahippocampal/fusiform gyrus (788.28 mm^2, cluster-wise p=0.0018). For cortical volume, the exercise group showed less decline in left fusiform/parahippocampal/entorhinal cortex (1734.84 mm^2, p = 0.0001), left inferior temporal cortex (560.95 mm^2, p=0.0325), and right fusiform cortex (735.22 mm^2, p=0.0059). Baseline amyloid pathology moderated these patterns, with stronger effects for cortical thickness among amyloid-positive participants in the left lateral occipital (725.90 mm^2, p=0.0051), left inferior temporal (695.27 mm^2, p=0.0078), and left supramarginal cortex (566.62 mm^2, p=0.0316), and for cortical volume in the left lateral occipital cortex (1651.33 mm^2, p=0.0001).

Conclusion: The 1-year exercise intervention attenuated cortical decline, particularly in lateral temporal and

fusiform gyrus regions. Effects were moderated by amyloid-positivity, suggesting that AD pathology influences the cortical responses to exercise. These findings support the potential protective value of exercise in older adults at elevated biological risk for AD.

Oral communication - O04

24-Hour Movement Behaviour Profiles and Cognition in Middle-Aged and Older Adults: A Cross-Sectional Analysis of the Canadian Longitudinal Study on Aging

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Background: Regular physical activity (PA), limited sedentary behaviour (SB), and good-quality sleep are integral for healthy cognitive aging. Whether specific combinations of PA, SB, and sleep (collectively known as 24-hour movement behaviours, 24HMBs) are associated with cognition remains unclear. We characterized 24HMB profiles and examined differences in cognitive performance among cognitively unimpaired middle-aged and older adults. Methods: A cross-sectional analysis of the Canadian Longitudinal Study on Aging (2010–2015) among 16,596 cognitively unimpaired adults (aged 45–85 years) with complete 24HMBs and cognitive data. We estimated PA using the Physical Activity Scale for the Elderly (score range 0-400; higher scores indicate greater PA). SB and sleep were self-reported. Cognitive outcomes were normalized latent scores of executive functions, memory, and global cognition. Mixed latent class analysis identified 24HMB profiles. ANCOVA adjusted for demographic, lifestyle, sensory, seasonal, and cardiometabolic factors assessed differences in cognitive performance across profiles. P-values were Benjamini-Hochberg false-discovery rate (FDR)-corrected. Results: Mean age was 61.8±10.0 years, 50.1% were female, 79.1% had a university degree. Three profiles emerged: “Near-Balanced” (n=13,273) had lower PA (119.3±48.4), were mostly non-sedentary (≤4h/day on ≤5 days/week; 58.1%), and slept 6.3±0.9 hours/night; “Active Living” (n=3,080) were highly active (265.2±47.0), non-sedentary (83.3%), and slept 6.3±0.9 hours/night; “Rest-Dominant” (n=243) were the least active (107.0±60.7), largely non-sedentary (53.9%), and slept 10.3±0.8 hours/night. “Rest-Dominant” showed poorer executive functions than “Near-Balanced” (Estimated mean difference [95% CI]=-3.6 [-6.0 to -1.3], FDR-p<0.008) and “Active Living” (-2.8 [-5.3 to -0.4], FDR-p<0.047). “Near-Balanced” showed better global cognition than “Rest-Dominant” (2.7 [0.4 to 5.3], FDR-p<0.047) and “Active Living” (0.9 [0.1 to 1.6], FDR-p<0.047). No differences in memory were observed. Conclusions: A profile with long sleep and low PA was associated with poorer executive functions and global cognition. High PA with low SB did not confer superior global cognition. A near-balanced 24HMB profile was linked to better cognitive performance.

Oral communication - O05

Take a Walk With Your Brain: A Randomized Controlled Trial Comparing Cognitive Effects of a Cognitively Enriched Walking Program versus Walking-Only and Control in Community-Dwelling Older Adults

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Background: Evidence is emerging for simultaneous cognitive and physical activity (PA) as a promising strategy to prevent cognitive decline in older adults. However, most studies examining this have been conducted in laboratory settings. This randomized controlled trial (RCT) examines the effectiveness of a co-created cognitively enriched walking program on cognitive functioning in community-dwelling adults aged 65+ years.

Methods: A three-arm RCT of a six-month intervention was conducted in a real-life setting, with measurements at baseline, 3 months, 6 months and 12 months. The 148 participants were randomly allocated to a (1) cognitively enriched walking program (WALK+, n=52), (2) walking program without enrichment (WALK-only, n=49), or (3) no-intervention control group (CONT, n=47). Both walking programs consisted of twice-weekly 60-90 minutes supervised group sessions. Short- and long-term memory, executive functioning and processing speed were assessed using the Cambridge Automated Neuropsychological Test Automated Battery (CANTAB). Data were analysed using linear mixed models.

Results: The median age of the participants was 69 years (range: 65-85), 72% were female and 72% had a higher education degree. Average attendance for the group sessions, including all randomized participants, was 67% in both the WALK+ and the WALK-only conditions. Comparing WALK+ to WALK-only and CONT, and WALK-only to CONT, there were no significant intervention effects on cognitive functioning at 3, 6, or 12 months. In per protocol analyses including participants who attended at least 75% of the sessions, there were differences in change score for STM between WALK+ and WALK-only (baseline-6 months, 6-12 months). There were also differences in STM between WALK-only and CONT (baseline-6 months, baseline-12 months).

Conclusions: The WALK+ program did not lead to statistically significant benefits for cognitive functioning compared to WALK-only or CONT. Future studies should explore for whom combined interventions may work and determine the optimal dosage.

Oral communication - O06

Objectively Measured Cardiorespiratory Fitness as a Potential Biomarker for Alzheimer's Disease Risk in Older Adults: Evidence from the Generation 100 Study

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Background
Cardiorespiratory fitness is a modifiable physiological trait linked to dementia risk, but whether objectively measured peak oxygen uptake (VO2peak) and short-term fitness changes in older adults are associated with Alzheimer's disease (AD) remains unknown. We examined whether baseline VO2peak and one-year fitness changes were associated with subsequent AD risk.

Methods
This prospective cohort study included participants from the Generation 100 Study. VO2peak was measured at baseline (2012–13) and at one-year follow-up. Participants were categorized as unfit (<80% of sex-specific mean VO2peak), moderately fit (80–99%), or fit (≥100%). Incident AD was identified through national health registries, hospital records, and the Norwegian Prescribed Drug Registry. Cox proportional hazards models estimated associations between VO2peak and incident AD.

Results
We included 1491 dementia-free participants aged 70–77 years with a mean baseline VO2peak of 28.7 mL/kg/min. During a median 8.7-year follow-up, 77 developed AD. Compared with unfit, moderately fit (aHR 0.54, 95% CI 0.29–0.98) and fit (aHR 0.52, 95% CI 0.29–0.93) participants had lower AD risk. Each 1 mL/kg/min higher baseline VO2peak was associated with 4% lower AD risk (HR 0.96, 95% CI 0.92–1.00). Maintaining VO2peak above 80% of the sex-specific mean (25.1 mL/kg/min for men; 20.9 mL/kg/min for women) was identified as a threshold of AD risk stratification, below which AD risk increased substantially. One-year VO2peak changes showed weaker associations with subsequent AD.

Conclusion
Higher VO2peak in older adults was associated with substantially lower AD risk, whereas short-term fitness changes did not confer additional benefit. These findings suggest that avoiding low fitness when entering old age may be more important for reducing late-life AD risk than achieving short-term improvements after the age of 70. CRF emerged as a clinical biomarker for AD, that may help stratify risk and inform preventive strategies.

Oral communication - O07

Not all movement behaviours equally: differential associations of 24-hour movement behaviours with mental health in Swedish preschool children. A compositional data analysis from the CAP Project

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Introduction: Physical activity (PA) during childhood provides important health benefits and helps limit sedentary behaviour (SB). Mental health problems in preschool children are a growing public health concern with potential long-term consequences. Evidence suggests that the distribution of time across the 24-hour movement behaviours, including moderate-to-vigorous PA (MVPA), light PA (LPA), SB and sleep time, may influence mental health outcomes. This study aimed to examine the associations between 24-hour movement behaviours and mental health in Swedish preschool children.

Study design: A cross-sectional study included 2015 Swedish preschool children (4.27±0.84 years; 47.69% girls). Mental health was self-reported by parents using the Strengths and Difficulties Questionnaire (SDQ), a 25-item behavioural screening tool covering emotional symptoms, conduct problems, hyperactivity, peer relationship problems, and prosocial behaviour. Movement behaviours were measured using wrist worn accelerometers. Compositional data analysis was applied using pivot coordinates to examine the associations between 24-hour movement behaviors and mental health outcomes. Linear mixed-effects models adjusted for age, sex, body mass index, and socioeconomic status were fitted, accounting for clustering at the school level.

Results: Greater relative time in MVPA compared to other movement behaviors was associated with lower emotional problems ($\beta=-0.351$, $p=0.002$) and peer problems ($\beta=-0.393$, $p<0.001$), but with higher

hyperactivity scores (β=0.707, p<0.001). In contrast, SB was positively associated with peer problems (β = 0.311, p = 0.008) and inversely associated with hyperactivity (β=−0.629, p=0.004). No consistent associations were observed for LPA or sleep time.

Conclusions: MVPA emerged as the movement behavior most consistently associated with mental health, with both beneficial and adverse associations depending on the outcome. SB showed domain-specific relationships, whereas LPA and sleep time were not consistently associated. These findings suggest that promoting MVPA, while reducing sedentary time, may be key for improving mental health in Swedish 55%preschool children.

Oral communication - O08

Childhood Adversity and Physical Activity Interact to Shape White Matter Microstructure in Thalamo-Occipital and Posterior Callosal Pathways

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Adverse Childhood Experiences are a well-established risk factor for enduring alterations in brain development, particularly within white matter pathways supporting sensory integration and cognitive processing. Physical activity is a key modifiable lifestyle factor known to promote white matter integrity across the lifespan, yet its potential role in moderating early adversity-related neurobiological alterations remains insufficiently characterized. In this study, we examined the interactive effects of exposure to early adversity, and lifetime physical activity (LPA) on white matter microstructure.

Adversity history was assessed with Childhood Trauma Questionnaire (CTQ) and weekly average of LPA was collected via the Lifetime Leisure Physical Activity Questionnaire. Diffusion-weighted imaging data were obtained from 97 participants, and whole-brain fixel-based analysis (FBA) was conducted to assess interaction effect of childhood adversity and physical activity on fiber density, fiber cross section, and their combined measure, fiber density and cross-section (FDC). Mean fixel based measure values were extracted from significant clusters and entered into post hoc moderation analyses.

Whole-brain FBA results showed that the trauma–LPA interaction effects were positively related to FDC in the thalamo-occipital tract and posterior segments of the corpus callosum. Post-hoc moderation analyses showed a robust interaction between total CTQ scores and LPA, with higher trauma exposure associated with significantly reduced FDC in individuals reporting low levels of LPA ($p = 0.0003$).

These findings indicate that low LPA may exacerbate the deleterious impact of adverse childhood experiences on white matter microstructure. The anatomical specificity to thalamo-occipital and posterior callosal pathways implicates sensory processing and interhemispheric communication as key neural systems sensitive to the combined effects of early-life stress and physical activity. Collectively, the results underscore the importance of physically activity lifestyle as a potential neurobiological resilience factor and highlight its relevance as a target for preventive and adjunctive interventions in trauma-related psychopathology.

Oral communication - O09

Effects of Different Types of School-Based Physical Activity Interventions on Executive Function, EEG Activity, and Mental Fatigue in Adolescents: The MENTALFIT Study

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Background: School-based physical activity (PA) may support cognitive functioning and help attenuate increases in mental fatigue across the school term. However, evidence comparing different PA modalities on executive function (EF), EEG activity, and mental fatigue (MF) in adolescents remains limited. This study examined the effects of three 10-week school-based PA interventions on EF, EEG activity, and MF during a trimester.
Methods: A quasi-experimental design was conducted across four secondary schools in Spain (MENTALFIT; NCT07427329). Participants (N = 189; 14–16 yrs; 49% female) were assigned to Active Breaks (AB; 5-min bouts between classes), Active Recess (AR), Physically Active Lessons (PAL), or Control across a trimester. Inhibitory control (Stroop), working memory (PVSAT), sustained attention (PVT-B), perceived mental fatigue (VAS 0–100), and EEG activity were assessed at the beginning of the trimester and again at the end, during the examination period. Data were pooled by intervention and analysed using linear mixed models, with Cohen's dz effect sizes.
Results: Significant Time × Group interactions emerged for Stroop reaction time ($F = 5.99$, $p = .014$, $\eta^2p = .027$) and mental fatigue ($F = 4.82$, $p = .028$, $\eta^2p = .023$). AB produced the largest improvement in inhibitory control ($\Delta = -58.5$ ms, $d = -0.44$, $p < .001$), replicated across two independent schools. PAL also improved Stroop reaction time ($d = -0.23$, $p = .039$). Working memory improved after PAL, AB, and AR. AB was the only intervention without a significant increase in mental fatigue, whereas PAL showed the largest rise. PAL also reduced PVT-B lapses. EEG analyses provided complementary neurophysiological evidence of intervention-related changes.
Conclusions: Active Breaks showed the most favourable profile, combining the largest inhibitory control improvement with no increase in perceived mental fatigue. These findings support integrating brief PA bouts between classes to promote adolescent cognitive and brain health during the school term.

Oral communication - O10

Aerobic training induces frequency-specific reorganization of directed brain networks

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Long-term aerobic exercise is increasingly recognized as a potent driver of training-induced brain plasticity, yet its impact on large-scale neural communication and network organization remains insufficiently understood. In particular, little is known about how sustained aerobic training shapes the information flow within resting-state brain networks. The present randomized controlled trial examined whether long-term aerobic exercise induces systematic reorganization of directed EEG connectivity in physically inactive young adults.

Participants were randomly assigned to an aerobic exercise group (n = 44) or a passive control group (n = 32). The exercise group completed a 12-week cycling ergometer program consisting of 6 weeks of moderate-intensity continuous exercise followed by 6 weeks of moderate- to high-intensity interval exercise. Resting-state EEG (eyes open) was recorded at baseline, mid-intervention (6 weeks), and post-intervention (12 weeks) using a 64-channel system. Directed effective connectivity was estimated using the Directed Transfer Function and quantified with graph-theoretical metrics indexing global integration, local segregation, and network organization. Frequency-specific effects were assessed using linear mixed-effects models.

Following the intervention, aerobic exercise was associated with systematic reorganization of directed EEG network topology. Global efficiency decreased across delta, theta, beta, and gamma frequency bands, as well as in the broadband network, indicating reduced large-scale integrative coupling. In delta and broadband networks, this reduction was accompanied by decreased assortativity, suggesting weakened hub–hub coupling and a less centralized organization of slow-frequency connectivity. In contrast, gamma-band networks showed increased local efficiency, clustering, and rich-club organization, reflecting enhanced local segregation and strengthening of densely interconnected high-frequency subnetworks.

Together, these findings demonstrate that long-term aerobic exercise induces frequency-specific reconfiguration of directed brain networks, characterized by a shift from globally integrated toward more locally segregated network organization. This pattern may reflect adaptive neuroplastic changes supporting efficient local information processing following sustained aerobic training.

Beyond the Built Environment: Neighborhood Deprivation and Brain Structure are Linked through Sedentary Behavior in Older Adults at Risk for Dementia

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Background: Physical and social-cognitive activities are modifiable risk factors for reducing dementia risk. While built environment features like walkability are thought to promote active lifestyles, neighborhood socioeconomic conditions, measured by the Area Deprivation Index (ADI), may play a more fundamental role in shaping health behaviors and subsequent brain health in older adults.
Aims: This study examined the associations between neighborhood walkability and ADI with physical and social-cognitive activity. Furthermore, we investigated whether sedentary behavior mediates the relationship between neighborhood deprivation and structural brain integrity.
Methods: We analyzed data from 1398 cognitively-unimpaired older adults (U.S. POINTER study) at risk for dementia. Neighborhood environments were characterized using the National Walkability Index and ADI. Activity levels were assessed via the CHAMPS questionnaire, focusing on light physical activity, sedentary behavior, and social-cognitive activities. Brain structure was quantified using MRI-derived Gray Matter (GM) volume (Meta-ROI). Mediation analyses were conducted using nonparametric bootstrapping.
Results: High neighborhood deprivation (ADI) was significantly associated with decreased physical function, increased sedentary behavior, lower social-cognitive activity ($p_{1,2,3}<0.01$) and gray matter volume ($p<0.05$). In contrast, walkability was not associated with physical activity levels or gray matter volume, though it did correlate with social-cognitive activity ($p<0.01$). Furthermore, mediation analysis revealed a significant indirect effect: higher ADI was associated with increased sedentary behavior, which in turn was associated with lower GM volume (ACME $p < 0.05$).
Conclusions: Our findings suggest that neighborhood socioeconomic disadvantage exerts a stronger influence on physical activity levels than the built environment alone. The discovery that sedentary behavior mediates the link between ADI and gray matter volume suggests that neighborhood-level interventions targeting sedentary time may be vital for preserving brain structure in vulnerable populations.

The (cost-)effectiveness of exercise therapy adjunct to guideline-concordant care for depression: A pragmatic randomised controlled trial

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Background: Many patients with major depressive disorder (MDD) do not respond sufficiently to first-line treatments. Due to its biological and psychological mechanisms, exercise may enhance the effectiveness of other MDD treatments. In a pragmatic randomized superiority trial, we evaluated the clinical and cost-effectiveness of exercise therapy adjunct to guideline-concordant care as usual (CAU) for MDD in specialized mental health care.

Methods: MDD outpatients (N = 112; Mage = 37; 51% female) were randomized to CAU (97% psychotherapy, 59% pharmacotherapy) or CAU+EX (CAU plus 12 weeks of exercise therapy: one supervised and two home-based moderate-intensity aerobic sessions/week). Depressive symptoms were assessed using the Inventory of Depressive Symptomatology-Self Report. Remission was evaluated during follow-up by blinded assessors using the Structured Clinical Interview for DSM-5. The economic evaluation followed a societal perspective.

Results: Patients in the CAU+EX condition exercised more minutes per week during treatment (CAU+EX: M = 98 min; CAU: M = 36 min) and at follow-up (CAU+EX: M = 100 min; CAU: M = 48 min). Moreover, patients in the CAU+EX condition were significantly more likely than those in CAU to meet the exercise prescription. However, only 22% of patients in the CAU+EX group fully adhered to the prescribed exercise regimen. Depressive symptoms decreased from severe to moderate depression in both conditions, with no significant difference between the conditions on symptom reduction (b = -0.22, [-0.72, 0.29]) or remission rate (OR = 0.06, [-0.20, 0.32]). Evidence for cost-effectiveness was found in the per-protocol (≥ six supervised exercise sessions) but not in the intention-to-treat sample.

Conclusions: Adjunct exercise therapy does not provide additional clinical benefits or cost-effectiveness in specialized mental health care. Low adherence to the exercise prescription limits its potential. Cost-effectiveness may be achievable with higher adherence, warranting emphasis on strategies to improve adherence in this population.

Oral communication - O13

Multidomain indicators of response to remote lifestyle-based rehabilitation after chronic stroke: integrated findings from the MindFit trial

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Background: Brain health after stroke is multidimensional and may not be captured by a single outcome domain. We integrated findings from the MindFit randomized controlled trial to characterize how multimodal lifestyle interventions yield behavioral, participant-reported, biological, neuroimaging, physical, and qualitative signals of change in chronic stroke.

Methods: MindFit was a single-blind, three-arm trial in 141 adults with chronic stroke comparing mindfulness-based stress reduction plus computerized cognitive training (MBSR+CCT), multicomponent physical exercise plus computerized cognitive training (PE+CCT), and CCT alone over 12 weeks; resting-state fMRI analyses were available in a subsample of 40 participants. This work integrates multidomain indicators from the trial.

Results: No significant between-group differences were found for the primary cognitive and mental health endpoints. However, intervention-specific profiles emerged across complementary outcomes. PE+CCT showed the clearest physical signal, including greater gains in leg strength and perceived physical fitness, and flexibility and speed. MBSR+CCT showed the clearest emotional/subjective profile, including mindfulness-mediated emotional improvement, broader gains in participant-reported distress, and qualitative reports of better emotional regulation. At the biological level, cortisol decreased in MBSR+CCT and PE+CCT, while VEGF remained stable only in MBSR+CCT. In rs-fMRI analyses, no between-group effects survived correction, but MBSR+CCT showed reduced default mode connectivity, consistent with a possible mindfulness-related brain adaptation.

Conclusions: In chronic stroke, different outcome domains captured complementary aspects of response to multimodal rehabilitation. Exercise-related intervention effects were more strongly reflected in physical indicators and cognition, whereas mindfulness-related effects were more consistently reflected in emotional, and exploratory mechanistic markers. Multidomain assessment may therefore provide a more informative account of brain-health response than any single endpoint alone.

Oral communication - O14

Effects of HIIT-based interventions on Alzheimer´s Disease plasma biomarkers in people living with cardiovascular disease

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Background

Coronary artery disease (CAD) is the most prevalent cardiovascular disorder, and accumulating evidence indicates that CAD is associated with an elevated risk of cognitive decline and Alzheimer´s Disease (AD) when compared with healthy individuals. However, the effects of different exercise interventions on AD plasma biomarkers as well as the pathophysiological mechanisms underlying this heart-brain connection remain unknown.

Methods

Individuals with stable CAD, aged 50 to 75 years, participated in the single-blind, three-arm Heart-Brain randomized controlled trial (NCT06214624). Participants were assigned to either: (1) high-intensity interval training (HIIT); (2) HIIT plus resistance training; or (3) usual care group. 12-week interventions consisted of 45-minute supervised exercise sessions three days per week. AD plasma biomarkers were quantified using SIMOA including Aβ42/40, BD-tau, GFAP, NfL, ptau217, ptau181 and the ptau217/Aβ42 ratio. Biomarker z-scores were analyzed with constrained linear mixed-effects models to test whether the changes over time were different between groups.

Results

We included 105 individuals (21% female) with a mean age of 62 ± 7 years and a mean body mass index of 29 ± 4 kg/m². No statistically significant time × group interactions were observed for any AD plasma biomarker ($p > 0.05$), with the exception of GFAP. For this marker, a significant difference was found between HIIT and usual

care groups (SMD: 0.17; 95% CI: 0.01, 0.33; p = 0.04/ HIIT: 71.7 to 75.3 pg/mL vs. usual care: 71.7 to 69.8 pg/mL), driven by an increase in the HIIT group.

Conclusions

In conclusion, while three months of different HIIT interventions did not broadly alter the selected biomarkers, the significant increase in GFAP suggests a specific adaptive response. Given its expression in both neural and peripheral tissues, this elevation may reflect systemic 'priming' and metabolic remodelling. Further research is needed to fully capture the longitudinal behavioral impact of HIIT.

Poster - IDa003

Immediate exercise-type-specific plasma proteomic and Alzheimer's disease biomarker responses: preliminary findings from the flADex crossover trial

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Background:
Central Nervous System (CNS)-related plasma proteomics and Alzheimer's disease (AD)-related blood biomarkers are increasingly used to characterize AD-related and neurodegenerative processes, yet their acute biological variability remains insufficiently understood. Acute exercise may transiently alter brain-related proteins and AD biomarkers, but modality-specific responses remain unclear. We examined whether acute aerobic and resistance exercise induces distinct immediate plasma proteomic and AD-related biomarker responses in older adults.
Methods:
We included 20 older adults (68–83 years) from the flADex randomized counterbalanced crossover trial with PET-confirmed negative brain amyloid status and APOEε4 non-carrier status. Participants completed three randomized 30-min conditions: moderate-intensity aerobic exercise, moderate-intensity resistance exercise, and seated rest watching a low-cognitive-demand documentary. Plasma samples were collected 5 min before and 3 min after each condition. CNS-related plasma proteins were quantified using the NULISAseq CNS Disease Panel, profiling >120 proteins across brain-related pathways. Targeted biomarkers, including Aβ42/40, GFAP, NfL, p-tau217, p-tau181 and BD-tau, were measured using Simoa HD-X assays. Pre-to-post between-condition differences were estimated using constrained linear mixed models. Proteomic analyses were corrected using global false discovery rate across proteins and contrasts.
Results:
Resistance exercise elicited the greatest immediate proteomic upregulation versus rest, with several proteins reaching global FDR-corrected significance. Aerobic exercise also induced significant changes versus rest but involved fewer proteins. Aerobic-versus-resistance comparison revealed exercise-type-specific proteins, predominantly reflecting greater upregulation after resistance exercise. Targeted biomarker analyses supported acute response differences across modalities, particularly for GFAP, NfL and p-tau217.
Conclusion:
A single bout of exercise induced immediate, modality-specific plasma molecular changes in older adults, with resistance exercise showing the most pronounced and predominantly upregulated proteomic profile. These findings highlight the importance of considering exercise modality when investigating brain-health mechanisms. Upcoming flADex analyses will examine molecular fluctuations at 50 and 70 min post-exercise to determine whether these responses persist, diverge, or stabilize during recovery.

Poster - IDa004

Lifestyle and physiological health shape brain fog during the menopausal transition

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The menopausal transition is frequently associated with subjective "brain fog", including difficulties concentrating and managing multiple tasks. However, most research has focused on evaluating declines in verbal memory post-menopause, while studies have not yet characterized a neurological signature of brain fog during the menopausal transition. This study aimed to examine whether self-reported brain fog in symptomatic perimenopausal women is reflected in objective cognitive performance and brain function, and whether physiological markers moderate these associations.

To date, 33 symptomatic women have been tested (recruitment ongoing), classified using STRAW+10. Night-time RMSSD was derived from wrist-worn PPG across seven nights. Participants then completed cognitive tasks (sustained attention, task switching, verbal memory) with brain fNIRS monitoring (48-channels), provided a venous blood sample, underwent DEXA body composition assessment, and a VO_2max test.

Preliminary findings indicate that higher brain fog was associated with slower sustained attention reaction times and greater right ventrolateral prefrontal activation, suggesting poorer performance alongside increased cortical recruitment. Higher brain fog was also associated with greater right ventrolateral prefrontal activation during the task switching paradigm, which was in turn associated with more switching errors. Brain fog was not associated with verbal memory performance or temporal activation during this task. Importantly, physical health moderated these relationships: higher visceral fat and lower VO_2max amplified adverse associations between brain fog and cognition / cortical activation. Finally, higher RMSSD predicted lower switch cost and lower prefrontal activation across all tasks, suggesting reduced cortical effort in participants with lower physiological stress. Hormonal assays are to be conducted ahead of the conference to enhance this data set.

Findings suggest that menopausal brain fog may be characterised by executive inefficiency and increased cortical effort, detectable using fNIRS. Importantly, physiological stress, adiposity, and fitness appear to shape these associations, highlighting potential lifestyle targets for supporting cognitive health during the menopausal transition.

Poster - IDa005

Physical Fitness as Predictor of Affective Health in Middle-Aged Women with Psychological Distress: The Exer-WAPA Project

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Introduction: Physically inactive middle-aged women with psychological distress face a significantly heightened risk for developing severe emotional disorders. However, the role of objective physical fitness components as independent protective factors on affective health remains underexplored in this population. Objective: To examine the associations between objective physical fitness components and affective profile, anxiety, and depressive symptoms in inactive middle-aged women. Methods: This cross-sectional study within the Exer-WAPA project included 130 physically inactive middle-aged women (35–60 years) with psychological distress. Physical fitness was assessed through cardiorespiratory fitness (6MWT), muscular strength, flexibility, and motor fitness (T-test), classifying participants as Fit or Unfit according to their performance. Psychological outcomes included positive and negative affect (PANAS), anxiety (BAI), and depressive symptoms (BDI-II). Correlation, group comparisons, and hierarchical multiple regression analyses adjusted for age, BMI, and SES were performed. Results: Participants classified as Fit based on 6MWT-distance showed significantly lower depressive (MD = -4.62, p = 0.012) and anxiety symptoms (MD = -6.56, p = 0.010), whereas T-test-Fit individuals only exhibited lower anxiety (p=0.030). Bivariate correlations showed 6MWT-distance linked with anxiety (r = -0.239, p = 0.008), while T-test performance correlated with anxiety (r = 0.303, p < 0.001) and depression (r = 0.262, p = 0.004). In adjusted models, 6MWT-distance independently predicted lower negative affect (β = -0.237, p = 0.020) and showed marginal trends-toward lower depression (β = -0.221, p = 0.068) and higher positive affect (β = 0.206, p = 0.069). No fitness components predicted anxiety; instead, SES emerged as the primary predictor for positive affect (β = 0.298, p = 0.010). Conclusion: Cardiorespiratory fitness, but not muscular strength or motor fitness, is a key independent predictor of reduced negative affect in inactive middle-aged women with psychological distress. While aerobic capacity buffers emotional distress, SES remains the primary driver of well-being.

Poster - IDa006

Anterior Midcingulate Cortex Volume and Cognitive Performance in Aging: Independence from Fitness and Alzheimer's Disease Biomarkers

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Normal aging is associated with alterations in frontocingulate regions, including the anterior midcingulate cortex (aMCC), a domain-general region supporting cognitive control and attentional regulation. Although cingulate morphology has been linked to cognitive performance, the contribution of aMCC structure to domain-specific cognition in cognitively unimpaired older adults remains unclear. Alzheimer's disease (AD) risk factors, including APOE ε4 carriage and elevated plasma phosphorylated tau217 (pTau217), are associated with cortical vulnerability and cognitive decline, yet their influence on aMCC–cognition relationships in aging is unknown. Cardiorespiratory fitness (CRF), a modifiable protective factor, may further shape these associations. We examined whether total aMCC volume relates to episodic memory and executive function (EF)/attentional control and whether these associations are moderated by CRF, APOE ε4 status, or pTau217-defined amyloid risk.

A total of 641 cognitively unimpaired older adults (mean age=69.85±3.75 years) from the IGNITE study underwent T1-weighted structural MRI, graded treadmill testing to assess VO_2peak, plasma pTau217 assays to determine amyloid status, and neuropsychological evaluation to derive latent cognitive factors. Total aMCC volumes were derived using Freesurfer (Destrieux atlas). Linear regression models examined associations between aMCC volume and cognition, controlling for age, sex, education, site, and estimated total intracranial volume (eTIV). Interaction models evaluated moderation by CRF, amyloid status, and APOE4 carriage.

Greater total aMCC volume was associated with better episodic memory (β=0.10, p=.017), working memory (β=0.11, p=.005), and visuospatial ability (β=0.10, p=.017). CRF, APOE4 carrier status, and amyloid positivity did not significantly moderate these associations (all p>.05). No associations were observed for EF/attentional control or processing speed (all p>.05).

Greater aMCC volume is associated with preserved cognitive performance in late adulthood, independent of aerobic fitness and AD-related pathology. Frontocingulate integrity may represent a potentially important neural correlate of cognitive resilience in older adults, although longitudinal studies are needed to clarify its role in cognitive aging trajectories.

Poster - IDa008

HIIT and HIIT plus Resistance Training on Cerebral Blood Flow in Individuals with Coronary Artery Disease: Preliminary Findings from The Heart-Brain Randomized Controlled Trial

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Background: Individuals with coronary artery disease (CAD) are at higher risk of cognitive decline and dementia, in which gray matter cerebral blood flow (CBF) plays a critical role. This study investigated the effects of High Intensity Interval Training (HIIT) and HIIT combined with resistance training (RT) on global and regional CBF in individuals with chronic CAD.

Methods: This trial included 105 participants (age 62.1±6.6 years, 21% women) randomly assigned to HIIT+RT (n=37), HIIT (n=35) or usual care (n=33). Multiple-delay pseudo-continuous arterial spin labelling data were used to estimate resting global gray matter and regional CBF, including the hippocampus, precuneus, and anterior/posterior cingulate cortex), before and after 12-week exercise interventions. Data were analyzed using available-case intention-to-treat constrained (baseline-adjusted) linear mixed models. Predefined subgroup analyses were conducted for age, sex, education, and CBF baseline level.

Results: No significant between-group differences were observed in CBF changes in the whole sample. However, participants with lower CBF at baseline showed greater CBF increases in the HIIT group compared to both usual care (+7.1 ml/100g/min, P=0.02) and HIIT+RT (+5.53 ml/100g/min, P=0.04). No effects were found on regional CBF.

Conclusion: Twelve weeks of HIIT+RT or HIIT did not increase CBF in the whole sample with CAD, but HIIT effectively increased CBF in those who had poorer CBF at baseline, i.e. those who potentially need it the most. Given the cognitive burden and elevated dementia risk in individuals with CAD, future studies should further investigate the impact of exercise on brain health, particularly in more vulnerable individuals.

Poster - IDa009

Associations of Muscular Strength with Anxiety Symptoms in Familial Hypercholesterolemia: Preliminary Analyses from the UPPA-FH Study

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Familial hypercholesterolemia (FH) is an inherited disorder associated with elevated LDL cholesterol and high cardiovascular risk, although its mental health impact remains unclear. Physical performance may represent a modifiable factor related to cardiovascular and mental health. However, the relationship between muscular strength and anxiety in FH is poorly understood. This study aimed to describe anxiety symptoms and examine their association with muscular strength in FH.

This cross-sectional study included 85 participants with FH (49.55 ± 13.18 years; 38.8% men) from the UPPA-FH study (Granada, Spain). Anxiety was assessed using the Hospital Anxiety and Depression Scale anxiety subscale (normal [0-7], mild [8-10], or moderate-to-severe [11-21]). Upper-and lower-body strength were measured via handgrip strength (HGS) and the 30-second chair stand test (30CST), respectively. Associations between anxiety and muscular strength were examined using linear regression models: crude (model 1), adjusted for age and sex (model 2), and additionally for BMI and smoking status (model 3).

Anxiety prevalence was 42.4%, with a higher rate in women (53.8%) than men (24.3%), moderate-to-severe cases were threefold higher in females (26.9% vs. 9.1%). In regression analyses, higher HGS was associated with lower anxiety in the crude model ($\beta = -0.370$; $p < 0.001$), but this association became borderline non-significant after adjusting for potential cofounders (model 2, $p = 0.063$; model 3, $p = 0.061$). No significant associations of 30CST with anxiety were observed (all $p > 0.05$).

These preliminary findings indicate that anxiety symptoms are prevalent in patients with FH, with a higher frequency observed in women. The disparity between physical markers suggests upper-body strength may be a more sensitive indicator of anxiety symptoms than lower-body strength in this population. Consequently, studies with larger sample sizes and intervention studies, such as the UPPA-FH study, are needed to clarify the role of muscular fitness in mental health among patients with FH.

Poster - IDa010

Domain-specific physical activity and Alzheimer's disease blood-based biomarkers in cognitively normal older adults: preliminary cross-sectional analysis from the AGUEDA trial

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Background: Physical activity (PA) is a modifiable lifestyle factor that may contribute to Alzheimer's disease (AD) prevention. However, whether specific PA domains are differentially associated with amyloid and tau biomarkers remains unclear. This study examined the cross-sectional associations of present domain-specific PA with AD-related blood-based biomarkers in cognitively normal older adults from the AGUEDA study.

Methods: In this cross-sectional study from the AGUEDA trial (NCT05186090), 89 cognitively normal older adults (mean age =71.7±3.9y, 60.3% females, 16.7% APOEε4 carriers) participated. PA was assessed using the International PA Questionnaire (IPAQ) and expressed as leisure-time PA, transport-related PA, and household PA in MET-min/week. The main outcomes were PET amyloid burden expressed as Centiloid and AD-related blood-based biomarkers, including Aβ42/40 ratios measured by IPMS and SIMOA, p-tau181, p-tau217, and p-tau217/Aβ42 ratios. Multiple linear regression models were adjusted for sex, age, education, and APOE-ε4 status. Variables were transformed when appropriate.

Results: No domain-specific PA variable was significantly associated with Centiloid, Aβ42/40, p-tau181, p-tau217, or p-tau217/Aβ42 after correction for multiple testing. The largest nominal associations were observed for transport-related PA with p-tau217 (βstd = 0.208, 95% CI: -0.015 to 0.430, p = 0.067), leisure-time PA with Aβ42/40 ratio measured by SIMOA (βstd = 0.198, 95% CI: -0.033 to 0.429, p = 0.092), transport-related PA with p-tau217/Aβ42 ratio measured by SIMOA (βstd = 0.194, 95% CI: -0.030 to 0.418, p = 0.089), and household PA with Aβ42/40 ratio measured by IPMS (βstd = 0.182, 95% CI: -0.045 to 0.409, p = 0.114). Overall, associations were small to moderate in magnitude and heterogeneous across biomarker and physical activity domains.

Conclusion: Leisure-time, transport-related, and household PA were not significantly associated with AD-related blood-based biomarkers in cognitively normal older adults. Longitudinal analyses and larger samples are needed to clarify whether domain-specific PA is associated with Alzheimer's disease biomarker trajectories over time.

Poster - IDa011

The association between sedentary behaviour and cognitive performance depends on muscle power

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Background: Sedentary behaviour has been associated with poorer cognitive outcomes, although findings are inconsistent and may depend on measurement methods and cognitive domains. Physical function may influence this association, but its potential moderating role remains unclear.

Objective: To examine the association between sedentary time and cognitive performance, and whether this association is moderated by lower-limb muscle power.

Methods: A cross-sectional analysis was conducted in 493 community-dwelling adults (60% women) aged 50–79 years from the Inlife-Aging project*. Sedentary time (hours/day) was assessed using the Global Physical Activity Questionnaire, and lower-limb muscle power was derived from the five-times sit-to-stand test. Global cognition was computed as a composite z-score covering memory, attention, executive function and language. Linear regression models examined whether the association between sedentary time and cognitive performance differed according to muscle power, adjusting for age, sex, education, physical activity, and body mass index.

Results: Sedentary time was not independently associated with cognitive performance ($B = 0.006$, $p = 0.881$). A significant interaction was observed between sedentary time and muscle power ($B = -0.061$, $p = 0.029$), even after adjustment for physical activity and other covariates, suggesting that the association between sedentary time and cognitive performance varies according to muscle power levels. Muscle power was positively associated with cognitive performance ($B = 0.35$, $p < 0.001$) but not with sedentary time ($B = 0.08$, $p = 0.068$), supporting its role as a potential moderator rather than a confounder.

Conclusion: Lower-limb muscle power moderates the association between sedentary behaviour and cognitive performance. These findings suggest that muscle power may represent a functional reserve influencing how sedentary behaviour relates to cognitive performance.

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Poster - IDa012

Exploring the Role of Cardiac Autonomic Modulation, Cardiorespiratory Fitness, and Sleep Quality in Psychological Distress: The Exer-WAPA Study in Middle-Aged Women.

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Introduction. Reduced cardiac autonomic modulation, low cardiorespiratory fitness (CRF), and poor sleep quality are associated with anxiety and depression. However, the contribution of these physiological and behavioural markers to anxiety and depressive symptoms remains under-investigated in physically inactive middle-aged women with psychological distress. Objective. To examine the associations and predictive value of cardiac autonomic modulation, CRF, and sleep quality regarding anxiety and depressive symptoms in this population. Methods. Cross-sectional study involving 130 physically inactive women (35–60 years) with psychological distress (GHQ-12 > 3). Anxiety and depressive symptoms were assessed using the Beck Anxiety Inventory (BAI) and Beck Depression Inventory-II (BDI-II). Cardiac autonomic modulation (RMSSD), CRF (6MWT-distance and cardiovascular efficiency index [CEI]), and sleep quality (PSQI) were evaluated. Statistical analyses included group comparisons, partial correlations, and hierarchical linear regressions adjusted for age, sleep quality, autonomic modulation and CRF. Results. Women at risk of anxiety and depression showed poorer sleep quality (all $p < 0.01$). Depressive symptom risk was additionally associated with higher resting heart rate ($p = .017$) and lower cardiovascular efficiency during exercise ($p = 0.038$). Weak-to-moderate inverse correlations emerged between anxiety symptoms and 6MWT distance ($\rho = -0.278$, $p = 0.002$) and cardiovascular efficiency ($\rho = -0.222$, $p = 0.017$), with comparable findings for depressive symptoms ($\rho = -0.196$ to -0.207; all $p < 0.05$). Sleep quality demonstrated the strongest associations with affective symptomatology ($\beta = 0.385–0.461$; all $p < 0.001$), explaining 18–22% of symptom variance. Resting RMSSD showed weak inverse associations with anxiety and depressive symptoms ($\rho = -0.05$ to -0.15), but were attenuated after adjustment for confounders. Conclusions. Sleep quality, rather than physical fitness or autonomic modulation, appears to be the primary independent correlate of anxiety and depressive symptoms in middle-aged women with psychological distress. Findings suggest that sleep-focused interventions should be integrated alongside physical activity programs to manage anxiety and depressive symptoms in this population.

Poster - IDa014

Association between dietary patterns and biomarkers of Alzheimer's disease in cognitively normal adults: preliminary findings from AGUEDA trial

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Background: Dietary patterns, such as the Mediterranean (MED), Dietary Approaches to Stop Hypertension (DASH), and Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diets, have shown cognitive benefits during aging; however, limited evidence exists regarding their direct impact on plasma and brain AD biomarkers in preclinical stages.

Objective: To determine the association between dietary patterns and brain amyloid-beta (Aβ) burden and plasma p-tau217/Aβ42 ratios in cognitively normal individuals over 65 years of age.

Methods: This cross-sectional analysis included 89 cognitively healthy participants (57% women) from the AGUEDA trial (NCT05186090). Semi-quantitative Food Frequency Questionnaire (FFQ) and daily consumption (resulting from FFQ) were used to calculate MED (range 0 to 55 points) DASH (range 0 to 10 points) and MIND (range 0 to 15 points) dietary patterns. Brain Aβ was quantified using the Centiloid scale. Plasma p-tau217 and Aβ42/40 ratios were measured using Immunoprecipitation-Mass Spectrometry (IP-MS) and Single Molecule Array (Simoa®) technology. Pearson correlation analyses, controlling for age, sex, and educational level were evaluated.

Results: Mean adherence scores were 25.67 ± 5.50 (MED), 4.61 ± 1.05 (DASH) and 7.72 ± 1.64 (MIND). There were no significant correlations of dietary patterns with brain Aβ (r range: -0.037 to 0.041; all $p > 0.712$), ptau217 Aβ42/40 IPMS (r range: -0.182 to 0.077; all $p > 0.485$), and ptau217 Aβ42/40 Simoa (r range: -0.035 to 0.077; all $p > 0.062$).

Conclusion: Adherence to MED, DASH, or MIND dietary patterns was not associated with brain amyloid burden or plasma p-tau217/Aβ42 ratios in cognitively normal older adults. These findings may suggest that the influence of dietary patterns on AD-related pathology is subtle during preclinical stages, potentially requiring more advanced disease states to become detectable. Larger longitudinal and interventional studies are needed

to clarify the role of diet in early AD prevention.

Poster - IDa015

Associations Between Physical Fitness Components and Regional Cortical Thickness in University Students

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Background: Cortical thickness is an important marker of cortical morphology and neurodevelopment that has been linked to physical fitness, primarily to cardiorespiratory fitness, across the lifespan. However, evidence in young adults is limited. Sex at birth has been proposed as a relevant factor that may influence the fitness-brain structure associations. The present study examines the relationships between fitness components and regional cortical thickness in university students, considering potential sex differences in them.

Methodology: This cross-sectional study included 88 university students aged 18-25 years (43 females). Cardiorespiratory fitness, muscular strength, balance, and flexibility were assessed. Regional cortical thickness measures were obtained. The associations between fitness components and cortical thickness measures were examined in the full sample using multiple linear regression models adjusted for age, sex, and vocabulary. Sex-stratified analyses were also conducted, with multiple linear regression models adjusted for age and vocabulary.

Results: In the full sample, cardiorespiratory fitness was negatively related to cortical thickness in the precuneus (β = -.349, p = .034), and muscular strength was positively related to entorhinal cortex thickness (β = .330, p = .037). In males, higher cardiorespiratory fitness was associated with greater cortical thickness in the frontal pole (β = .322, p = .041), while in females, higher cardiorespiratory fitness was associated with reduced cortical thickness in the anterior cingulate gyrus (β = -.366, p = .029) and the precuneus (β = -.422, p = .011), while higher muscular strength was linked to greater cortical thickness in the entorhinal cortex (β = .404, p = .007).

Conclusions: These findings underscore the complex interplay between fitness components and cortical thickness in early adulthood, likely reflecting region-specific neurodevelopmental processes. The results also point to potentially different association patterns by sex.

Poster - IDa016

Associations between Life's Essential 8 and white matter integrity in cognitively normal older adults from the AGUEDA trial.

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Background: Cardiovascular risk and poor cardiovascular health are strongly associated with later development of dementia. Reduced white matter integrity is an important marker of brain aging and cerebrovascular damage and has been linked to cognitive decline and dementia. Life's Essential 8 (LE8) is a multidomain cardiovascular health indicator that includes several modifiable health factors and behaviors. However, the association between LE8 and brain white matter integrity remains insufficiently explored. Therefore, this study aimed to examine the association between LE8 total score and white matter integrity in cognitively normal older adults.

Methods: We analyzed baseline data from 91 cognitively normal older adults from the AGUEDA randomized controlled trial (71.8 ± 3.9 years). The LE8 score (range 0-100) was derived from the unweighted average of standardized scores across eight health factors: physical activity, sleep, diet, nicotine exposure, glucose, lipids, body mass index, and blood pressure. Higher LE8 total score means better cardiovascular health. White matter integrity was assessed using peak width of skeletonized mean diffusivity (PSMD) and white matter hyperintensity (WMH) volume. WMH analyses included 80 participants, whereas PSMD data were available for 88 participants. Linear regression models adjusted for age, sex, and years of education examined associations between LE8 and white matter integrity markers.

Results: Higher LE8 score was significantly associated with lower whole-brain WMH (βstd = -0.258, p = 0.024), deep WMH (βstd = -0.238, p = 0.043), and periventricular WMH (βstd = -0.247, p = 0.029). No significant association was observed between LE8 score and PSMD (βstd = 0.015, p = 0.876).

Conclusion: Better cardiovascular health, reflected by higher LE8 score, was associated with lower macrostructural white matter damage, but not with microstructural damage (PSMD). These findings support multidomain cardiovascular health metrics as potential targets for reducing macrostructural cerebrovascular damage during aging. However, longitudinal studies are needed to confirm these associations and clarify their clinical significance.

Poster - IDa017

Can Physical Exercise boost Digital Literacy Learning in Older Adults: A pilot study

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Background: Physical exercise positively influences cognitive functions critical for learning. Consequently, an acute bout of moderate exercise may enhance attentional capacity and subsequent learning in older adults. This study uses digital literacy training—a vital yet often deficient skill in this population—to assess whether preceding aerobic exercise potentiates learning outcomes.

Objective: To evaluate whether a bout of moderate aerobic exercise prior to digital literacy classes could enhance learning outcomes, compared to a low-intensity stretching protocol.

Methods: Sixteen older adults (4 men, 12 women; 62-79 years) participated in an 8-session program. Baseline assessments showed no significant group differences in age, education, physical condition (6-Minute Walk Test), or initial self-perceived digital literacy (Mobile Device Proficiency Questionnaire - MDPQ). Sessions comprised 25 minutes of exercise followed by 25 minutes of digital literacy training. Participants were assigned to a moderate aerobic group (60-80% max HR) or a low-intensity group (<60% HR). Heart rate (HR) was monitored to ensure compliance. A Stroop test was administered in a single session, pre- and post-exercise, to assess acute attentional changes. Pre- and post-intervention MDPQ scores were analyzed using repeated-measures ANOVA.

Results: Both groups significantly improved their MDPQ scores post-intervention ($p = 0.024$), with no significant between-group differences. Baseline MDPQ correlated negatively with age, but not with fitness or education. HR data revealed that while intensity differed between groups, the aerobic group spent only an average of 8 minutes in the target zone. Furthermore, the Stroop test showed no significant acute effects on attention in either group.

Conclusion: The training program effectively improved self-perceived digital skills. The lack of superiority in the aerobic group may be due to insufficient time spent in the moderate-intensity zone, failing to elicit the acute cognitive improvements in attention (as shown by the Stroop test) necessary to potentiate subsequent learning.

Poster - IDa018

Effects of a 12-Week Cardiac Rehabilitation Program on Stroop Performance in Patients with Coronary Artery Disease.

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Background: Patients with coronary artery disease (CAD) are at increased risk of cognitive decline. Cardiac rehabilitation primarily improves cardiovascular health, although exercise adaptations may also benefit cognitive function. Previous evidence suggests that exercise-based CR may improve psychomotor speed, attention, memory, and executive function. However, it remains unclear whether acute cognitive responses to exercise lead to chronic adaptations in inhibitory control after CR.

Purpose: To evaluate the chronic effects of a 12-week cardiac rehabilitation program on inhibitory control in patients with CAD.

Methods: Forty-one patients with coronary artery disease (CAD) (mean age: 59.4 ± 8.9 years) performed a cardiopulmonary exercise test (CPET) at baseline and after completing a 12-week CR program. Cognitive performance was assessed using a computerized Stroop test administered immediately before and 15 min after each CPET. Changes in cardiorespiratory fitness were analysed using paired-samples t-tests. Additionally, a two-factor repeated-measures ANOVA was conducted to examine chronic changes in Stroop.

Results: Cardiorespiratory fitness significantly improved after the 12-week intervention ($t = -8.197$, $p < .001$, $d = -1.280$). Repeated-measures ANOVA revealed significant improvements in Stroop response times across congruent, neutral, and incongruent conditions following the intervention. In the incongruent condition, significant main effects were observed for both baseline/post-intervention assessments ($F = 8.436$, $p = .006$, $\eta^2p = 0.174$) and exercise condition ($F = 19.361$, $p < .001$, $\eta^2p = 0.326$), with post hoc analyses showing improved response times both before ($p = .006$) and after CPET ($p < .001$). Similar improvements were observed in the congruent and neutral conditions, with trends toward interaction effects.

Conclusions: A 12-week CR program improved cardiorespiratory fitness and was associated with improved Stroop response times in patients with CAD. Significant chronic improvements were observed before and after CPET across all conditions, together with significant changes in the acute effects of exercise on cognitive inhibition.

Poster - IDa019

Physical Activity and All-Cause Mortality by Depression and Treatment Status: data from the U.S. National Health Interview Survey

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AIMS. To examine the association of physical activity (PA) intensity and volume with all-cause mortality depending on depressive status, and to assess whether these associations differ according to depression treatment.

METHODS. We analyzed pooled data from 2010-2018 U.S. National Health Interview Survey, a nationally representative cross-sectional survey with prospective mortality linkage. Leisure-time PA was self-reported and categorized according to WHO recommendations. Depressive symptoms and treatment status (i.e., pharmacological and/or psychotherapy) were also self-reported. Cox proportional hazards models were used to estimate hazard ratios (HR) and 95% confidence intervals (CI) for all-cause mortality across PA levels and depression groups, adjusting sequentially for potential confounders. Dose-response associations were analyzed, testing interactions between PA and depression status/treatment using Wald test.

RESULTS. From a total of 129,818 participants, 8,872 (6.8%) reported depressive symptoms. During a mean (SD) follow-up of 4.74 (2.5) years, 7,904 (6.1%) all-cause deaths occurred. Mortality risk was elevated in individuals with depressive symptoms compared with those without (HR [95% CI] =1.60 [1.45-1.76]). Greater levels of any PA intensity were generally associated with lower all-cause mortality across groups. The highest level of MVPA (>300 min/week) was associated with a 50% lower mortality risk in individuals without depression and a 59% lower risk in those with depression, compared with no MVPA. Moderate PA showed the most consistent inverse association, with a graded reduction in mortality risk and a significant interaction with depression status/treatment (p for interaction = 0.017); the strongest mortality benefits were observed among adults without treatment, followed by those receiving combined pharmacotherapy and psychotherapy.

CONCLUSION. PA was associated with a lower all-cause mortality risk among U.S. adults with depressive symptoms, with moderate PA showing the most consistent benefits. The magnitude of benefit varies by depression treatment status, suggesting that MPA may be particularly relevant for untreated individuals.

Poster - IDa020

Using steps to improve functional capacity, cardiovascular and brain health in adults with heart failure: design of the STEP-IN randomized controlled trial

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BACKGROUND: Heart failure (HF) affects >60 million people globally. Its clinical management is challenging, as HF often coexists with several cardiovascular- and brain-health related comorbidities (e.g., hypertension, dyslipidemia, diabetes, cognitive impairment). The prescription of physical activity (PA) represents a promising adjuvant to pharmacological treatments to improve patients' functional capacity, manage modifiable risk factors influencing the heart-brain axis, and maintain a physically active lifestyle long-term as patients' exercise tolerance improves. However, most patients with HF have shown low PA levels. In response, the STEP-IN trial aims to develop and evaluate an individualized, accessible, and digitally supported step-based PA intervention adapted to the needs of this population.

METHODS: This two-arm, single-blind multicenter randomized controlled trial will enroll 200 adults with HF with reduced (≤40%) or mildly reduced left ventricular ejection fraction (41-49%) and a NYHA functional class II or III. Participants are randomized 1:1 to a 9-month step-based PA intervention or usual care. The intervention uses wearable devices (Fitbit), a personalized online platform (HealthyChronos©) and behavior change techniques to progressively increase participants' daily step count (volume) and step cadence (intensity), with increments individually planned every 2 weeks. The primary outcome is the change in functional capacity measured with a six-minute walk test from baseline to 9 months. Additional outcomes related to cardiovascular and brain health are also measured at baseline and 9 months, including blood-based biomarkers of systemic inflammation and neurodegeneration, cardiac function and structure measured by echocardiography, brain structure and function measured by magnetic resonance imaging, and cognitive function assessed by paper-based and computerized tests.

CONCLUSION: If proven effective, STEP-IN will provide insight into the mechanisms through which step-based PA programs may improve cardiovascular and brain health in adults with HF. The scalable nature of STEP-IN may subsequently facilitate its translation into routine clinical, making PA more accessible to this population.

Poster - IDa021

Two-decade trends in the association between physical activity and psychological distress in US adults: evidence from the National Health Interview Survey, 1998–2018.

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Aim: To examine trends in the prevalence and association of physical activity (PA) and psychological distress (PD) over two decades in the US adult population.

Methods: We analyzed data from 560,519 adults across 21 waves of the US National Health Interview Survey (NHIS, 1998-2018). Moderate-to-vigorous PA and PD (Kessler 6-item scale [K6] score; K6≥6 for moderate-to-serious PD) were self-reported. The association between meeting PA recommendations (≥150 min/week) and PD was estimated using design-corrected linear and logistic regression models incorporating PA×year interaction terms, with predicted marginal estimates derived at each survey year. Temporal stability was further characterized through 21 independent annual cross-sectional models.

Results: Both the prevalence of meeting PA recommendations and mean K6 scores increased across the observation period, with persistent gaps in distress levels favoring physically active individuals. In the pooled sample, meeting PA recommendations was associated with lower mean K6 scores ($\beta = -0.24$; 95% CI −0.27, −0.21; $p<0.001$) and lower odds of moderate-to-serious PD (OR = 0.80; 95% CI 0.78, 0.82; $p<0.001$). Year-specific analyses revealed that the inverse association between PA and mean K6 score strengthened progressively across survey waves, with the gap in distress severity between PA groups widening over time (PA×year interaction: $F=20.66$; $p<0.001$). By contrast, no significant temporal interaction was observed for the odds of moderate-to-serious PD ($F=1.09$; $p=0.296$), suggesting that this widening reflected a growing divergence in symptom severity across the full K6 distribution rather than a differential shift in the population prevalence of clinically relevant distress.

Conclusion: PA was consistently and inversely associated with PD over two decades of nationally representative US data, with the magnitude of this association growing progressively stronger for symptom severity but remaining stable for the prevalence of moderate-to-serious PD. These findings support the role of PA as a robust and increasingly relevant correlate of population mental health.

Poster - IDa022

Acute Effects of Exercise on Executive Function and Memory in Patients with Ischemic Heart Disease.

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Background: Patients with coronary artery disease (CAD) are at increased risk of cognitive decline, affecting not only executive functions such as inhibitory control but also memory domains, including declarative and visuospatial memory (Taylor, 2023). Although growing evidence suggests that exercise-based cardiac rehabilitation (CR) is an effective non-pharmacological strategy to mitigate cognitive decline, most studies have primarily focused on executive function, with limited attention to memory-related processes.

Purpose: To determine the acute impact of exercise on cognitive interference and memory performance in patients with coronary artery disease.

Methods: Eighteen patients with coronary artery disease (CAD) and with a mean age of 58.22 ± 8.9 years performed a cardiopulmonary exercise test (CPET). Memory function was assessed using the Rey Auditory Verbal Learning Test (RAVLT) for declarative memory and the Corsi Block-Tapping Test for visuospatial memory, administered at baseline and immediately after the CPET. Cognitive interference was evaluated using a Stroop test, administered immediately before and 15 minutes after the CPET. Normality was assessed using the Shapiro–Wilk test. Acute changes in cognitive performance were analysed using paired-samples t-tests.

Results: Paired-samples t-tests revealed significant changes in cognitive performance following acute exercise. In the Stroop Test, a significant effect was observed in the congruent condition ($t = 7.271$, $p < .001$, $d = 1.714$), whereas no significant changes were found in the neutral ($p = .360$) or incongruent conditions ($p = .770$). No significant effects were observed in visuospatial memory. Declarative memory showed significant improvements in medium-term ($t = 3.201$, $p = .005$, $d = 0.754$) and long-term recall ($t = 2.296$, $p = .037$, $d = 0.574$).

Conclusions: Acute exercise elicited improvements in specific cognitive domains rather than a generalized effect. Significant changes were observed in processing speed and declarative memory. These findings suggest a domain-specific cognitive response to acute exercise.

Poster - IDa023

Integrating muscle function and cognition as healthspan outcomes in a multimodal lifestyle intervention for individuals with subjective cognitive decline: preliminary framework from the VITA study

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Background: Subjective cognitive decline (SCD) represents a critical window for early interventions aimed at preserving brain health and promoting healthy aging. Cognitive trajectories in later life are closely linked to modifiable lifestyle factors, including physical activity, muscle function, metabolic health, and inflammation. Within a healthspan framework, preserving cognition should therefore be considered alongside physical capacity and muscle health, as these domains may interact bidirectionally during aging.
Objective: The VITA study evaluates whether a multimodal lifestyle intervention combined with epigallocatechin gallate (EGCG, a natural flavanol from green tea) can improve healthspan-related outcomes in individuals with SCD. In this meeting, we present the rationale and preliminary framework for integrating objective muscle-mass assessment into the evaluation of cognitive and physical outcomes.
Methods: VITA is a randomized controlled trial enrolling adults aged 60–80 years with SCD. Participants are allocated to an intervention group receiving EGCG plus a multimodal lifestyle intervention (Mediterranean diet counselling, personalized physical activity emphasizing strength and balance, and cognitive and social stimulation) or to a control group receiving healthy lifestyle recommendations. Outcomes include cognitive function, assessed with the NIH Toolbox cognitive battery, and physical performance and muscle function, assessed through the 6-minute walk test, the knee extensor power, and the push/pull power. The D3-creatine dilution test will be used to objectively estimate muscle mass before and after the intervention.
Expected results: Preliminary pre-post data are expected for approximately 20 participants, including changes in muscle mass, physical function, and cognition. These data will explore the feasibility and added value of incorporating D3-creatine dilution as a sensitive marker of muscle health in multidomain brain-health interventions.
Conclusion: This preliminary work positions muscle health as a key component of healthspan-oriented strategies for brain health. Integrating objective muscle-mass measures may help clarify how lifestyle interventions targeting physical activity contribute to cognitive resilience in aging.

Poster - IDa024

Efficacy of Combining Multicomponent Training with Physically Active Lifestyle Recommendations on Cognitive Function of Older Adults with Probable Mild Cognitive Impairment: MOVEMENTE Study Protocol

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Purpose: Our aim is to describe the MOVEMENTE trial, a 16-week randomized trial (RBR-109qrbcj) designed to assess the combined effects of a multicomponent training program and strategies to promote a physically active lifestyle on cognitive function in older adults with probable mild cognitive impairment (pMCI).

Methods: A sample of 108 older adults aged ≥65 years with pMCI (e.g., subjective cognitive complaints or objective scores of MCI) will be recruited. Participants will be randomly allocated to either the intervention or control group, both attending sessions twice weekly. The intervention group will participate in a multicomponent training program including moderate-intensity strength/power and balance training, gait and dual-task exercises. Beginning in the 8th week of the intervention, participants will receive an activity tracker with individualized weekly step-count goals. They will also receive standardized recommendations via WhatsApp to increase physical activity (PA) levels and reduce sedentary behavior (SB). The control group will perform light-intensity, non-structured PA and will receive the same PA/SB recommendations. The primary outcome will be a composite score of cognitive performance. Secondary outcomes will include individual cognitive measures (MoCA, Stroop, Trails, Digit Span, DSST, and verbal fluency); device-based (GT3X-BT) and self-reported measures of the 24-hour activity cycle (e.g., PA, SB, and sleep); functional performance; body composition; cardiometabolic health; psychological well-being; and health-related quality of life. Assessments will be conducted at baseline and after the 16-week intervention. For the 24-hour activity cycle, an additional assessment will be conducted at week 8.

Results: Between July and December 2025, 88 participants were screened; 42 met the eligibility criteria (age=72±4years; 79%women; MoCA=20±4) and were randomized, with 33 completing the trial protocol.

Conclusion: Establishing the efficacy of exercise training combined with recommendations promoting a physically active lifestyle to support cognitive health may improve our ability to prescribe exercise interventions for older adults with cognitive impairment.

Poster - IDa025

Cardiorespiratory fitness supports working memory through adaptive neural recruitment in cognitively unimpaired older adults

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Background: Cardiorespiratory fitness (CRF) is consistently linked to better cognitive performance in aging, yet the neural mechanisms underlying this relationship remain incompletely understood. This study examined whether CRF is associated with working memory performance and task-related brain activation, and whether neural activation mediates the CRF–performance relationship in older adults.

Methods: Baseline data from 624 cognitively unimpaired older adults (69.8 ± 3.7 years; 72% female) from the IGNITE trial were analyzed. CRF was indexed by VO_2peak from a graded treadmill test. Participants completed an n-back working memory task during fMRI scanning. Whole-brain analyses tested associations between VO_2peak and task-evoked activation (one-back, two-back, and two-back > one-back contrasts). ROI-based bootstrapped mediation analyses (5,000 iterations) examined whether CRF-related activation mediated associations between VO_2peak and task accuracy, adjusting for age, sex, education, and site.

Results: Higher VO_2peak was associated with better working memory performance (one-back: $\beta = 0.09$, $p = 0.035$; two-back: $\beta = 0.13$, $p = 0.003$). Greater CRF was also linked to increased activation in frontal, parietal, temporal, and motor-related regions during the two-back condition, including precuneus, middle temporal gyrus, superior frontal gyrus, precentral gyrus, and supplementary motor area. Mediation analyses revealed that activation in left-lateralized frontoparietal and motor regions partially mediated the relationship between VO_2peak and two-back accuracy. Effects were stronger under higher cognitive load and absent for the one-back condition. No evidence supported reduced activation in higher-fit individuals.

Conclusions: Higher CRF is associated with better working memory and greater recruitment of task-relevant neural systems in older adults. Rather than reflecting neural inefficiency, increased activation in higher-fit individuals appears adaptive, particularly under high cognitive demand. These findings identify task-evoked

neural recruitment as a key pathway linking CRF to cognitive performance, supporting CRF as a modifiable factor for promoting cognitive resilience in aging.

Poster - IDa027

Effects of resistance training on brain age and the pace of aging derived from magnetic resonance imaging: preliminary results from the AGUEDA trial.

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Introduction: Investigating potential interventions that delay brain age and the pace of aging is relevant from a clinical and public health perspective. Emerging evidence has suggested that brain age can be reduced with aerobic exercise or combined diet-exercise programs. The effect of other exercise types, such as resistance exercise (RE), remain unclear. This study examined the impact of a 24-week RE program on brain age and the pace of aging in cognitively unimpaired older adults and explored moderating factors.

Methods: Ninety participants (mean age: 72 ± 4 years; 58% female) were randomly assigned to a 24-week RE group (3 sessions/week, 60 min/session, n = 46) or a wait-list control group (n = 44). Brain-predicted age difference (brain-PAD) and Dunedin Pace of Aging Calculated from NeuroImaging (DunedinPACNI) were derived from T1 magnetic resonance imaging at baseline and post-intervention. A negative brain-PAD means a younger brain relative to chronological age, and lower DunedinPACNI scores indicate slower pace of aging. Therefore, reductions in either outcome are interpreted as beneficial. Baseline-adjusted mixed models were used to test per-protocol intervention effects (>80% attendance). Moderators included sex, education, APOE-ε4 status, PET-amyloid status, and baseline outcome level (younger vs. older brain for brain-PAD, and median split for DunedinPACNI). All analyses were adjusted for chronological age and image quality.

Results: No differences between the RE and control groups were found for brain-PAD (standardized mean difference = +0.06; 95% CI: -0.06 to 0.18; p = 0.34) or DunedinPACNI (standardized mean difference = +0.06; 95% CI: -0.17 to 0.28; p = 0.62). No moderation effects were observed for either brain-PAD or DunedinPACNI.

Conclusion: The 24-week RE program appears insufficient to counteract physiological brain aging or the pace of aging of the entire body in cognitively unimpaired older adults.

Poster - IDa028

Exercise modulates proteins of circulating extracellular particles in the elderly at risk of accelerated cognitive decline

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Background: Physical activity improves whole-body metabolism and brain health in older adults at increased risk of neurodegenerative disease. Exercise-regulated extracellular particles (EPs) emerge as key mediators of interorgan communication and potential modulators of brain plasticity. This study examines exercise-induced changes in cerebrospinal fluid (CSF) and circulating EPs protein profiles in older adults.

Methods: Cerebrospinal fluid (CSF) was collected from elderly individuals with and without mild cognitive impairment (MCI; F/M 20/5; median age 66 years [IQR 60–80], BMI 26.5 kg/m² [IQR 21.1–34.6]) before and after a 3-month supervised combined aerobic–strength exercise intervention (3×1 h/week) using atraumatic lumbar puncture (Sprotte). Serum samples were obtained at baseline, immediately after, and 60 min following acute exercise (40min cycling, 65–75% HRmax), before and after the intervention. EPs were isolated from serum and CSF using ExoQuick. and characterized by NTA, TEM, immunoblotting, and Exo-Check Array. Cognitive performance (ACE-R, DSST) was assessed pre- and post-intervention.

Results: Serum-derived EPs ApoE levels were significantly reduced after the 3-month intervention, with decreases also observed at baseline and immediately after acute exercise ($p<0.01$). In CSF-derived EPs, ApoE levels increased following the intervention ($p<0.01$), while adiponectin remained unchanged. In sedentary cognitively healthy elderly, adiponectin increased immediately after acute exercise and returned to baseline at 1h postexercise (both $p < 0.05$), with a similar but attenuated response after training ($p<0.1$). Exercise training tended to improve cognitive performance (ACE-R, $p<0.1$). EPs adiponectin correlated positively with DSST score and ACE-R memory subscore (both $p<0.05$). Immunogold labelling confirmed adiponectin localization within serum-derived EPs.

Conclusion: Our findings indicate that physical exercise modulates metabolic and neuroplasticity-related proteins in CSF and circulating EPs in older adults at risk of accelerated cognitive decline, suggesting systemic exercise-induced molecular adaptations in aging.

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Poster - IDa031

Differential prefrontal and parietal activity in surgeon brains between conventional and robotic-assisted arthroplasty

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Background: Monitoring brain function during physically demanding, real-world tasks presents a significant methodological challenge. Functional Near-Infrared Spectroscopy (fNIRS) is well-suited to naturalistic settings given its portability, and tolerance of motion, making it a strong candidate for brain health monitoring during real-world tasks. Standard GLM-based analysis, however, requires predefined task timings, limiting its utility in unstructured or continuous activity. Hidden Markov Models (HMMs) offer a data-driven alternative, identifying discrete recurring modes of brain activity without prior knowledge of task structure. Time-Delay Embedded HMMs (TDE-HMMs) extend this by capturing temporospatial signal dynamics, improving sensitivity in naturalistic recordings.

Objectives: To demonstrate a fNIRS and TDE-HMM pipeline capable of characterising cortical dynamics during a prolonged, naturalistic task, using orthopaedic surgery as a proof-of-concept setting.

Methods: Six orthopaedic surgeons completed 27 procedures (12 conventional, 15 robotic-assisted) during total hip and knee arthroplasty, wearing an Artinis Brite MkII fNIRS system (48 channels) covering prefrontal cortex and bilateral parietal lobes. HbDiff (HbO - HHb) was analysed using TDE-HMMs with +/-5 s lags and PCA retaining 60 components. K = 10 states was selected via variational free energy. Mean state occupancy was compared between surgical modalities using independent-samples t-tests and within-surgeon paired tests.

Results: The pipeline decoded 10 brain states, with a covariance profile across prefrontal and parietal cortex. States differentiated surgical modalities: State 8 (bilateral DLPFC coupling) was more prevalent in conventional surgery (0.194+/-0.148 vs 0.076+/-0.093; t(3)=2.78, p=0.069, d=1.61), while State 7 (reduced inter-regional covariance) predominated in robotic procedures (d=-0.80), demonstrating the method's sensitivity to differences in cognitive engagement.

Conclusion: This pipeline demonstrates that wearable fNIRS combined with TDE-HMMs can characterise cortical dynamics during prolonge, naturalistic tasks without requiring predefined task structure. This approach is directly applicable to exercise and brain health research, enabling monitoring of cortical engagement during training, rehabilitation, and occupational performance in natural settings.

Poster - IDa032

Effects of a 24-Week Resistance Exercise Intervention on regional White Matter Hyperintensities: findings from The AGUEDA Trial

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Introduction:

Cerebral small vessel disease, represented by white matter hyperintensities (WMH), is a key contributor of cognitive decline and Alzheimer's Disease (AD). We examined whether a 24-week resistance exercise (RE) intervention modifies regional WMH burden, specifically in periventricular and deep regions and its association with attentional control.

Methods:

Ninety cognitively normal older adults (mean age: 72 ± 4 years; 58% female) from the AGUEDA randomized controlled trial were assigned to a 24-week RE group (3 times/week, n = 46) or a wait-list control group (n = 44). Brain MRI data (3T Siemens Magnetom TIM Trio; T1-weighted and 3D FLAIR) were acquired and subsequently processed using the UBO-Detector pipeline to quantify periventricular and deep WMH volumes, where higher values indicate greater lesion burden. Attentional control was derived from a comprehensive cognitive test battery. Intention-to-treat (ITT) analysis was applied to regional WMHs using constrained linear mixed models and post-intervention between-group contrasts.

Results:

ITT analysis revealed no significant between-group differences in periventricular WMH progression (standardized mean difference (SMD) = -0.13; 95% CI -0.33 to 0.08; p = 0.225). However, a trend toward reduced deep WMH progression was observed in the RE group compared to controls (SMD = -0.27, 95% CI -0.58 to 0.04; p = 0.089). In the control group, periventricular WMH changes (β = -0.68, p = 0.031) and deep WMH changes (β = -0.78, p = 0.001) were significantly associated with a decline in attentional control changes. Conversely, these associations were not observed for periventricular WMH changes in the RE group, while a positive association between deep WMH changes and attentional control changes was observed (β = 0.31, p = 0.046).

Conclusion:

Although no significant structural changes were observed in WMHs regional volumes over 24 weeks of RE, the intervention was associated with preserved attentional control, suggesting a potential neuroprotective effect that appears independent of underlying WMH progression

Poster - IDa033

10-year associations between cardiorespiratory fitness and brain structures in older adults

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Background: Cardiorespiratory fitness (CRF) is an established biomarker of physical health and has also been associated with brain health, particularly cortical and hippocampal structures. However, longitudinal evidence linking CRF to brain structures in later life is limited. In this study, we followed older adults over a 10-year period and examined associations between CRF (at baseline, follow-up and across time) and brain structural outcomes at 10 years. Methods: A subsample of 396 participants between 70-77 years at baseline from the Generation 100 Study was included. Brain MRI was performed at the 10-year follow-up, while CRF, assessed as peak oxygen uptake, was measured at both baseline and 10-year. Freesurfer was used to extract cortical area and thickness, and subcortical volumes. To assess associations between CRF and brain structures, mixed linear models were performed. Results: Baseline CRF was significantly associated with cortical area at the 10-year follow-up, while CRF at 10-year showed a similar but non-significant trend. There were no associations between change in CRF from baseline to 10-year and cortical area. Further, no significant relationship was found between CRF and hippocampal volume, cortical volume, or cortical thickness. Conclusion: Higher CRF at baseline was associated with greater cortical area 10 years later, suggesting that fitness level in early old age is linked to more favorable brain structural characteristics later in life.

Poster - IDa035

A step-based physical activity program to enhance functional capacity and heart-brain health in patients with heart failure: design of the STEP-IN intervention.

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Background: Heart failure (HF) is a chronic condition that not only causes physical fatigue but also increases the risk of cognitive decline. Being physically active may attenuate such disabling symptoms, yet adherence to structured exercise programs remains low. To address this gap, this study aims to describe the intervention of the STEP-IN trial.

Methods: STEP-IN is a multicenter, randomized controlled trial including 200 adults with HF (ejection fraction <50%; New York Heart Association class II–III). Participants are randomly assigned (1:1) to usual care or to the STEP-IN intervention, which aims to progressively increase daily step count (volume) and step cadence (intensity).

Participants in the intervention wear a wrist-worn activity tracker (Fitbit Inspire 3) for self-monitoring over 9 months. During the first three months, step count goals (steps/day) are updated every two weeks, following a graded progression of approximately 5% increase based on each participant's median step count over the previous 14 days and individual perceptions. From month four onwards, cadence targets (daily minutes spent at 80–120 steps/min) are introduced to promote moderate-intensity physical activity through gradual increases at individualized cadence thresholds.

To support behaviour change, HealthyChronos©, an online platform, provides real-time visual feedback and enables remote monitoring by research staff. Additional components include three face-to-face coaching sessions, personalized WhatsApp prompts, motivational badges and technical support. The coaching sessions use a person-centred approach to enhance motivation, address barriers, provide physical activity education, and support practical skills such as goal setting, action planning and long-term physical activity maintenance.

Main assessments include functional capacity, cardiovascular/brain-health biomarkers, cardiac and brain imaging, and cognitive function.

Conclusion: The STEP-IN intervention offers a scalable strategy to promote physical activity and aims to improve

health outcomes in patients with HF. If effective, its replication and future implementation in research and clinical settings will improve care for them.

Poster - IDa036

Interactions between physical activity and psychological distress in relation to mortality: temporal trends in US adults, 1998-2018

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Aim: To examine multiplicative and additive interactions between physical activity and psychological distress (PD) on all-cause and cardiovascular (CVD) mortality, and to assess the temporal stability of these interactions over two decades. Methods: We analyzed data from the 1998-2018 US National Health Interview Survey (NHIS) linked to the National Death Index (censored December 31, 2019). Moderate-to-vigorous physical activity (MVPA) and PD (Kessler 6-item scale, K6) were self-reported. Associations with all-cause and CVD mortality were estimated with Cox proportional hazards models adjusting for covariates, with dose-response relationships characterized via restricted cubic splines. Multiplicative interaction was tested using Wald tests and additive interaction was quantified using the relative excess risk due to interaction (RERI). Temporal trends were examined through three-way interaction models (MVPA×PD×survey year). Results: Among 560,519 pooled adults (mean age 46.2 years; 49.4% male), 53.3% did not meet MVPA recommendations (≥150 min/week) and 15.5% had moderate-to-serious PD (K6 ≥6). K6 score was associated with higher all-cause and CVD mortality regardless of MVPA status; MVPA was associated with lower mortality regardless of PD status. No multiplicative interaction was observed between meeting MVPA recommendations and K6 score (all-cause: p=0.091; CVD: p=0.296) or between having moderate-to-serious PD and MVPA (all-cause: p=0.691; CVD: p=0.709). Joint analyses revealed a clear risk gradient, with the highest mortality risk in the doubly-exposed group (not meeting PA + moderate-to-serious PD; all-cause: HR [95% CI]=1.65 [1.60, 1.70]; CVD: 1.82 [1.71–1.92]), consistent with a purely additive joint effect (all-cause: RERI [95%CI]=0.052 [-0.037, 0.141]; CVD: 0.059 [-0.113, 0.230]). Interaction estimates remained stable across survey waves (all-cause: p=0.218; CVD: p=0.220). Conclusion: PA and PD are independently associated with all-cause and CVD mortality, with no multiplicative interaction and a temporally stable additive joint effect, underscoring the importance of addressing both risk factors simultaneously in public health strategies.

Poster - IDa037

Association of cardiovascular health with psychosocial outcomes in patients with coronary artery disease: Preliminary findings from the Heart-Brain trial

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Background

Depression, anxiety and poorer quality of life are more prevalent in individuals with coronary artery disease (CAD). Psychosocial and cardiovascular health share behavioral and biological pathways, including lifestyle behaviors and cardiometabolic risk factors. Yet, the association between Life's Essential 8 (LE8) -a comprehensive score of cardiovascular health- and the psychosocial health of individuals with CAD remains unclear. We aimed to examine the associations between the LE8 score and psychosocial outcomes in individuals with CAD.

Methods

This cross-sectional analysis included 101 individuals (21% females) aged 50–75 years with stable CAD and no psychiatric diagnosis or depression from the Heart-Brain randomized controlled trial. The LE8 score (range 0–100) was derived from diet, physical activity, nicotine exposure, sleep, body mass index, blood lipids, blood glucose, and blood pressure. Participants completed psychosocial health questionnaires to assess self-reported depressive and anxiety symptoms (Hospital Anxiety and Depression Scale, HADS), depressive symptoms (30-item Geriatric Depression Scale, GDS-30), stress (Perceived Stress Scale), loneliness (UCLA Loneliness Scale), self-esteem (Rosenberg Self-Esteem Scale), and health-related quality of life (36-item Short Form Health Survey, SF-36). Linear regression models were adjusted for sex, age, and education.

Results

Descriptive characteristics of the sample were (mean±SD): age, 62.2±6.6 years old; LE8 score, 66.6±8.7 points; HADS depression, 3.4±3.1 points; HADS anxiety, 8.0±4.3 points; SF-36 physical component, 52.7±6.6 points; SF-36 mental component, 48.6±9.6 points. Associations are reported as standardized beta coefficients (βstd) and 95% confidence intervals (CI). LE8 score was not significantly associated with HADS depression (0.01;

-0.20–0.22), HADS anxiety (-0.17; -0.37–0.02), GDS-30 (-0.05; -0.25–0.15), stress (-0.12; -0.32–0.08), loneliness (0.03; -0.18–0.23), self-esteem (0.01; -0.19–0.22), SF-36 physical component (0.14; -0.06–0.34), or SF-36 mental component (-0.08; -0.28–0.12).

Conclusion

In individuals with stable CAD enrolled in an exercise trial, LE8 score was not associated with mental health or quality of life. Larger studies are warranted to confirm these findings.

Poster - IDa038

From Daily Functioning to Life Satisfaction: The Mediating Role of Mental Health

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Background: Daily functioning is reflected in people's activity performance and participation across different daily contexts. When this functioning is compromised, participation restrictions may arise and affect well-being and satisfaction. Resilience and mental health may play a relevant role in this relationship; however, these factors may also be influenced by daily functioning itself. Understanding these relationships is essential to explain the direct and indirect influence of daily performance and participation restrictions on perceived well-being. Thus, the aim was to test the mediating role of resilience and mental health outcomes (i.e., anxiety, depression and stress symptoms) in the relationship between daily performance and satisfaction with life in young adults.

Methods: 140 typically developing young adults participated in the study (78% females; mean age: 22.2±2.6). Resilience, mental health symptoms, satisfaction with life, and daily performance were assessed with self-reported, well-validated tools such as the BRS, the DASS-21, the LISAT-11, and the AAC-Q. Direct, indirect, and mediating effects were tested using a structural equation modelling approach.

Results: The model revealed a complex combination of direct, indirect, and mediating effects between daily performance and satisfaction with life, in which mental health symptoms completely mediate this relationship. While daily performance has a direct effect over resilience and depression, anxiety and stress, and these factors also have a direct effect on satisfaction with life, only when mental health outcomes are involved does daily performance significantly influence satisfaction with life.

Conclusion: Daily performance may contribute to perceived well-being in young adults through its association with resilience and mental health symptoms. These findings suggest that limitations in everyday activities and participation extend beyond functional outcomes, also shaping psychological adjustment and life satisfaction. Interventions designed to promote well-being in young adults should therefore address daily activity performance alongside strategies aimed at strengthening resilience and supporting mental health.

Poster - IDa040

Interaction Between Cardiorespiratory Fitness and Cognition in Heart Failure: The Moderating Role of Cerebral Pulsatility

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Introduction: Patients with heart failure (HF) frequently exhibit cognitive impairment, particularly affecting executive functions. Cardiorespiratory fitness, assessed by peak oxygen uptake (peak VO_2), is a key prognostic marker in HF and has been associated with cognitive performance. Cerebral pulsatility (CP), a marker of cerebrovascular health influenced by cardiac function, may also contribute to cognitive decline, although its role remains poorly understood. Objective/Methods: This study examined the relationships between peak VO_2, cerebral pulsatility, and cognition in 41 HF patients (67 ± 8 years, 34% women, left ventricular ejection fraction 39% ± 12). Cerebral pulsatility was assessed using transcranial Doppler ultrasonography at the right middle cerebral artery. Patients were divided into three groups according to peak VO_2 (<12, 12–16, and >16 $mL \cdot kg^{-1} \cdot min^{-1}$). Results: Patients with lower peak VO_2 demonstrated significantly poorer cognitive performance, particularly on executive tasks including Stroop inhibition, Stroop switching/flexibility, and Trail Making Tests A and B. Adjusted MoCA scores also differed significantly between groups, indicating worse global cognition in patients with reduced cardiorespiratory fitness. Although cerebral pulsatility was not significantly associated with peak VO_2 and did not differ between groups, higher pulsatility was independently associated with poorer Stroop inhibition and switching performance after adjustment for age, sex, and education. Moderation analyses revealed a significant interaction between peak VO_2 and cerebral pulsatility ($\beta = -7.64$, $p = 0.002$). The beneficial association between higher peak VO_2 and executive performance decreased as cerebral pulsatility increased. Conversely, the detrimental effect of elevated pulsatility on cognition was attenuated in patients with higher peak VO_2. Conclusion: These findings suggest that impaired executive functioning in HF is associated with reduced cardiorespiratory fitness and altered cerebrovascular hemodynamics. Further studies should investigate additional echocardiographic and cerebrovascular parameters, particularly according to sex and HF phenotype.

Poster - IDa041

Association Between Handgrip Strength and Global Cognitive Function in Adults Aged 60 and Older: ExerMOT4Health Project

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Introduction: Handgrip strength has been proposed as a biomarker associated with cognitive function in older adults, reflecting neural and motor system integrity (1). Previous studies have reported associations between strength and cognitive performance, although findings vary across settings (2,3). Examining this relationship in community-dwelling and institutionalized older adults may help clarify(1).

Objective: To examine the association between handgrip strength and global cognitive function in adults aged ≥60 years, considering the role of living arrangements.

Methods: This cross-sectional study included 362 adults (121 institutionalized) aged ≥60 years (mean age 72.2±10 years; 141 men) from the ExerMOT4Health project. Global cognitive function was assessed using the Montreal Cognitive Assessment (MoCA)(4). Handgrip strength was measured in a seated position with the arm extended, and the best recorded value was used for analysis. Spearman's correlation assessed the association between handgrip strength and MoCA score in the sample. Linear regression models were used to examine this association in the overall sample, adjusting for age and sex (Model 1) and then for living arrangement (Model 2). Stratified analyses by living arrangement were conducted, adjusting for age and sex.

Results: In the overall sample, handgrip strength was positively correlated with MoCA score (ρ=0.560, $p<0.001$). In linear regression analyses, this association was significant in Model 1 (β=0.369, $p<0.001$), but not in Model 2

(β=0.057, p=0.273). In stratified analyses adjusted for age and sex, handgrip strength was positively associated with MoCA score in community-dwelling participants (β=0.271, p=0.008), but not in institutionalized participants (β=0.007, p=0.951).

Conclusion: Handgrip strength was associated with global cognitive function in older adults, particularly among those living in the community. These findings suggest that living arrangements may play a role in the relationship between physical and cognitive function in later life.

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Poster - IDa043

Associations between physical condition parameters, working memory performance, and task-related brain activation in older adults: fMRI findings from the AGUEDA trial

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OBJECTIVE:To examine the associations between physical condition parameters with working memory performance and task-related brain activation in cognitively normal older adults.

METHODS:A cross-sectional analysis was conducted within the AGUEDA trial (NCT05186090), including 89 cognitively healthy older adults (mean age=71.61±3.85 years;41.6% males). Participants completed an n-back working memory task during functional magnetic resonance imaging. Working memory was assessed using accuracy, reaction time, and inverse efficiency (reaction time/accuracy) under low (1-back) and high (2-back) cognitive load conditions. Hgher values of reaction time and inverse efficiency reflected better performance. Physical condition parameters included cardiorespiratory fitness (6-minute walk test), muscular strength (handgrip), and gait velocity variability (OptoGait system). Multiple linear regression models examined associations between physical condition parameters and both task performance and whole-brain task-evoked activation during the 1-back, 2-back, and 2-back minus 1-back contrasts, adjusting for age, sex, and education.

RESULTS:Higher performance on cardiorespiratory fitness was significantly associated with greater accuracy (β=0.362,p=0.002) and better inverse efficiency (β=0.33,p=0.009) during the 2-back condition, but not for 1-back condition. No significant associations were observed for muscular strength or gait variability in relation to working memory (all p>0.05). Higher cardiorespiratory fitness, but not muscular strength or gait variability, was significantly associated with greater task-related activation in the 2-back minus 1-back contrast, specifically in left-lateralized fronto-parietal and subcortical networks (i.e., precentral and postcentral gyrus, middle frontal gyrus, and inferior parietal cortex), as well as subcortical regions (i.e., putamen, caudate, and thalamus), and the right anterior cingulate cortex (Zmax range=3.37–4.39). No significant associations were observed for 1-back or 2-back contrasts.

CONCLUSION:Cardiorespiratory fitness, but not muscular strength or gait variability, was associated with working memory performance and greater recruitment of task-relevant fronto-parietal and subcortical networks in older adults during working memory-related brain activation.These findings suggest that cardiorespiratory fitness is associated to working memory by neural recruitment of specific functional networks.

Poster - IDa045

Associations between multidimensional sleep measures and domain-specific cognitive function across repeated observations in adults aged 55 years and older

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Background: Sleep is increasingly recognised as a modifiable factor in cognitive ageing, but evidence remains inconsistent and is often limited by cross-sectional designs, single sleep measures and global cognitive outcomes. This study examined whether multiple device-measured and self-reported sleep characteristics were associated with domain-specific cognitive function across repeated observations in community-dwelling adults aged 55 years and older, and whether these associations differed across time points.

Methods: Adults aged ≥55 years were assessed at three time points over two years (baseline n=233; 51.1% women; mean age 68.3±7.7 years). Sleep measures included device-measured sleep duration and sleep efficiency from seven-day wrist accelerometry, sleep quality assessed using the Pittsburgh Sleep Quality Index, and a multidimensional sleep health score integrating device-measured and self-reported dimensions of sleep duration, efficiency, timing, regularity, alertness and perceived sleep quality. Cognitive outcomes were Cambridge Neuropsychological Test Automated Battery composite z-scores for short-term memory, long-term memory, executive function and processing speed. Mixed-effects models examined associations between time-varying sleep characteristics and cognitive outcomes and tested sleep-by-time interactions. Models were fitted within 20 imputed datasets, pooled using Rubin's rules, and adjusted for age, sex, educational level, living situation and total physical activity, with a random intercept for participant.

Results: Sleep duration, subjective sleep quality and multidimensional sleep health were not significantly associated with short-term memory, long-term memory, executive function or processing speed. Higher sleep efficiency was associated with better executive function, and sensitivity analyses using wake after sleep onset showed a comparable pattern. Sleep-by-time interactions were not significant, providing no evidence that sleep–cognition associations differed across time points.

Conclusion: In adults aged ≥55 years, sleep characteristics were not associated with domain-specific cognitive function, except for a positive association between sleep efficiency and executive function. Findings suggest that sleep continuity may be more relevant than measured sleep dimensions in relation to cognitive ageing.

Poster - IDa048

Students' Perceived Attention in Fifth-Grade Classrooms that Promote Movement: The MOVI-OLE Study

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Introduction: The school day, characterised by long, uninterrupted periods of sedentary behaviour, may negatively affect students' health and attention. The MOVI-OLE intervention replaces traditional desks and chairs with versatile and dynamic furniture that facilitates movement and participatory, experiential learning. However, evidence regarding its impact on cognitive processes such as attention remains limited.

Objective: To explore primary school students' perception of their level of attention in movement-promoting classrooms equipped with versatile and dynamic furniture, using the qualitative Photovoice technique.

Methods: A total of 24 fifth-grade primary education students (CEIP Félix Grande, Tomelloso, Ciudad Real) participated in this pilot study. The Photovoice technique was implemented in three phases. First, students photographed the MOVI-OLE classroom following the prompt: "Take a photo of the area where you concentrate best," and answered guided written questions. One week later, in small groups, they presented their responses and answered the researchers' questions. Finally, a plenary discussion was held to share the main findings. Data (images, written responses, and audiovisual recordings) were analysed using thematic analysis with NVivo 15 support.

Results: Students reported improved attention in the MOVI-OLE classroom, supported by dynamic furniture that allows posture changes and the selection of workspaces according to personal preferences. In particular, dynamic seating promotes self-regulation and enhances comfort compared to traditional chairs, helping students redirect their attention to tasks. Additionally, the furniture generates less noise when moved, which, according to students, facilitates concentration. The reorganisation of the classroom space encouraged movement-based and multisensory learning activities. An improved learning climate was also reported.

Conclusion: The MOVI-OLE classroom is perceived as an environment that enhances students' attention by facilitating self-regulated movement, postural comfort, and a more flexible and participatory spatial organisation. The incorporation of dynamic furniture may contribute to the creation of more active and learning-supportive classrooms.

Poster - IDa049

Effects of controlled breathing techniques on cognitive function in adolescents: a systematic review

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Adolescence is a critical developmental period characterized by ongoing brain maturation and heightened vulnerability to academic, social, and emotional stressors. These factors can compromise brain health, particularly executive functions, attention, and memory, which are essential for cognitive performance and psychological well-being. Controlled breathing techniques have emerged as accessible, low-cost interventions capable of modulating autonomic activity, emotional regulation, and cognitive processes. However, evidence regarding their specific effects on adolescent cognitive function remains fragmented and largely extrapolated from adult or university-based populations.

The aim of this systematic review is to synthesize the scientific evidence on the acute and chronic effects of controlled breathing techniques on objectively measured cognitive functions in adolescents aged 12–18 years. This protocol follows the PRISMA 2020 guidelines and has been registered in PROSPERO (registration pending). A comprehensive search will be conducted in MEDLINE/PubMed, Scopus, Web of Science, PsycINFO, and SPORTDiscus from inception to March 2026. Eligibility criteria will be defined using the PICOS framework, including experimental and quasi-experimental studies assessing explicit breathing interventions (e.g., slow breathing, diaphragmatic breathing, pranayama, paced breathing, or structured protocols such as box breathing) and objective outcomes related to attention, memory, executive functions, processing speed, or neurophysiological activity (EEG/ERP).

Two independent reviewers will perform study selection, data extraction, and methodological appraisal. This review is expected to clarify which breathing techniques are most effective for enhancing adolescent cognitive performance and brain health, identify knowledge gaps, and inform evidence-based educational and preventive interventions aimed at optimizing cognitive functioning during secondary education.

Poster - IDa050

Changes in serum levels of GPLD1 in healthy older adults predict future risk of Alzheimer's disease

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Background: Higher peak oxygen uptake (VO2peak) is associated with lower Alzheimer's disease (AD) risk, but underlying biological mechanisms are not well understood. The liver-derived enzyme glycosylphosphatidylinositol-specific phospholipase D1 (GPLD1), shown in rodents to mediate exercise-related cognitive benefits, may represent a biomarker of AD risk in older adults. Objective: To determine whether serum GPLD1 levels and changes over one year predict future AD, and whether GPLD1 mediates the association between fitness and reduced AD risk. Methods: A prospective case-control study nested from the Generation 100 Study, a randomized, exercise training intervention study on healthy, older adults. GPLD1 and VO2peak were measured at baseline (2012) and one-year follow-up (2013). AD and all-cause dementia outcomes were identified from hospital records (2014–2022). Age- and sex-matched controls (ratio 2:1) remained cognitively unimpaired at 10-year follow-up. Associations were estimated using logistic regression. Results: A total of 261 adults (50.6% women, mean age 73.1) who were healthy at both measurement points were included. Cases (n=87) developed AD (n=58) or other dementias (n=29). Higher GPLD1 at one-year follow-up, but not baseline, was associated with lower AD risk (OR 0.88, 95%CI 0.78–1.00). Increases in GPLD1 from baseline to one year were associated with lower AD risk (OR 0.77, 95%CI 0.62–0.95). No significant associations were observed for all-cause dementia. Higher baseline VO2peak was associated with reduced AD risk (OR 0.93, 95%CI 0.87–0.98), and adjustment for GPLD1 did not materially change this association. Conclusions: In healthy older adults, increases in GPLD1 levels over time were associated with a lower risk of developing AD up to a decade later, suggesting that GPLD1 may serve as a disease-specific biomarker. Although fitness was protective, its association with AD was not mediated through GPLD1, suggesting independent pathways. Validation in external cohorts is needed before GPLD1 can be incorporated into preclinical AD risk stratification.

Poster - IDa051

Plasma microRNAs distinguish preclinical Alzheimer's disease from cognitively healthy aging

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Background: Blood-based biomarkers offer a promising, minimally invasive approach for early detection of Alzheimer's disease (AD), which is crucial for timely intervention. We aimed to identify microRNAs in plasma samples that could detect AD up to 10 years before clinical symptoms.
Methods: Plasma samples were collected from 70-77-year-old individuals who were free from cognitive impairment at baseline and either remained cognitively healthy or were diagnosed with AD during a 10-year follow-up. Next-generation sequencing (NGS) was employed for microRNA discovery in 84 samples (n=28 AD, n=56 control). The validity of the identified microRNAs was tested using quantitative PCR in another set of samples from similarly defined subjects (n=20 AD, n=20 control). The ability of the microRNAs to distinguish patients with AD from cognitively normal individuals was evaluated utilizing an external microarray dataset (n=1021 AD, n=288 control). Bioinformatic tools were employed to explore pathways enriched with targets of the microRNAs.
Results: NGS identified 11 dysregulated microRNAs in men and 1 in women that were later diagnosed with AD ($p < 0.05$). While unable to detect significant differences, the targeted PCR analysis confirmed 4 of the microRNAs (miR-99b-3p, miR-671-5p, miR-26b-3p, and miR-3151-3p) expressed in majority of the samples. In the external microarray dataset, both the 12 miRNAs from NGS and the 4 most expressed microRNAs showed equally high discriminative ability to distinguish AD patients from cognitively healthy individuals (area under the curve 0.87, $p < 0.0001$, and overall classification accuracy of about 85%).
Conclusions: Plasma microRNA expression patterns may reveal AD in preclinical stage. However, some microRNAs that differentiate AD from healthy cognitive aging may not be detectable with PCR due to low expression levels. Further investigations in larger cohorts and with longitudinal assessment of microRNA levels are warranted.

Poster - IDa053

Effects of a 24-week resistance exercise intervention on gray matter volume and dynamic functional connectivity in cognitively normal older adults: The AGUEDA randomized controlled trial

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Background: Resistance exercise (RE) may support healthy brain aging, but its effects on structural and dynamic functional brain outcomes remain unclear. This study examined the effects of a 24-week RE intervention on whole-brain gray matter volume (GMV) and resting-state dynamic functional connectivity (rs-dFC) in cognitively normal older adults, and whether these effects were moderated by baseline amyloid-β (Aβ) status.

Methods: Ninety cognitively normal older adults were drawn from the AGUEDA randomized controlled trial. Whole-brain voxel-wise analyses assessed between-group differences in pre-to-post GMV change and in local and distant rs-dFC change. GMV analyses used a peak-level uncorrected threshold of $p < 0.001$ with cluster-extent correction, whereas rs-dFC analyses used $p \leq 0.01$ and cluster-level family-wise error correction at $p < 0.05$. Additional analyses tested whether baseline Aβ status moderated intervention effects.

Results: Significant between-group differences in GMV change were observed in temporal regions. Compared with controls, the RE group showed lower GMV change in the right superior temporal pole ($t = 5.331$) and right middle temporal pole ($t = 4.103$), whereas the control group showed higher GMV change in a second right superior temporal cluster ($t = 4.008$) and the left middle temporal pole ($t = 4.361$). No significant between-group differences were found for local or distant rs-dFC. Baseline Aβ status significantly moderated intervention effects on GMV in the right inferior temporal gyrus ($t = 3.712$), left inferior occipital cortex ($t = 4.293$), and left postcentral gyrus ($t = 2.631$), but not on local or distant rs-dFC.

Conclusions: RE was associated with region-specific GMV changes, but not rs-dFC changes, in cognitively normal older adults. The structural pattern was heterogeneous and not uniformly favorable relative to controls. Baseline Aβ status may contribute to inter-individual variability in structural brain responses to exercise.

Poster - IDa054

Effects of physical exercise interventions on cognitive outcomes in children and adolescents with cancer: an umbrella review of systematic reviews with meta-analyses.

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INTRODUCTION: Children and adolescents with cancer frequently experience cognitive impairments affecting attention, memory, and executive function during and beyond treatment. Exercise interventions are a promising adjuvant strategy to counteract these adverse effects. However, evidence on their effects on cognitive outcomes remains heterogeneous, and overall certainty has not been systematically assessed.

OBJECTIVE: To synthesise the effects of exercise interventions on cognitive outcomes in children and adolescents with cancer, and to assess the methodological quality and certainty of the available evidence.

METHODOLOGY: An umbrella review of systematic reviews with meta-analyses was conducted in PubMed, Web of Science, Scopus, SPORTDiscus and CINAHL from their inception to January 2026. Eligible studies were systematic reviews with meta-analyses of controlled trials (randomised or non-randomised) evaluating exercise interventions in individuals aged ≤19 years with cancer. Cognitive outcomes were defined as cognitive performance (objective measures) and cognitive function (patient- or proxy-reported outcomes).

RESULTS: Two systematic reviews with meta-analyses, including 18 primary studies (n=1,232 participants) were identified. Based on the most comprehensive meta-analyses, exercise interventions induced significant benefits on cognitive performance (5 primary studies and n=245; standardised mean difference [SMD]=0.41; 95%CI: 0.17 to 0.65; p=0.001) and cognitive function (13 primary studies and n=987; [SMD]=0.26; 95%CI: 0.08 to 0.44; p=0.004). The certainty of the evidence was moderate in both cases. These effects were observed in meta-analyses including studies conducted during and/or after treatment.

CONCLUSIONS: Physical exercise appears to be a promising complementary intervention for improving cognitive outcomes in children and adolescents with cancer. Although the certainty of the evidence is moderate, these findings support the inclusion of exercise in supportive care strategies aimed at promoting brain health.

KEYWORDS: physical exercise; cognitive outcomes; paediatric cancer; brain health; umbrella review.

Poster - IDa055

Effects of High-Intensity Interval Training and Creatine Administration on Adult Hypothalamic Neurogenesis and Inflammation in Middle-Aged Mice

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Background: The hypothalamus is a key brain region that integrates sensory information and regulates essential physiological processes by combining hormonal and metabolic signals. Recently, adult neurogenesis has emerged as a crucial mechanism by which the hypothalamus maintains neuroplasticity, allowing it to adapt continuously to changes in the internal and external environments. Aging disrupts this adaptability through a progressive decline in adult neurogenesis and an exacerbation of neuroinflammation. Middle age represents a transitional phase when these changes begin to manifest, providing a vital window for early preventive interventions. Physical exercise has been shown to significantly modulate hypothalamic neurogenesis and mitigate neuroinflammation. Furthermore, creatine is a vital modulator of cellular energy homeostasis with recognized neuroprotective and anti-inflammatory properties. However, the synergistic effects of exercise and bioenergetic strategies, such as creatine administration, remain largely unexplored.

Objective: This study examines body weight changes and concurrent modulations in adult hypothalamic neurogenesis and microglial-mediated neuroinflammation in middle-aged mice exposed to a high-intensity interval training (HIIT) protocol and creatine administration.

Methods: Middle-aged, wild-type C57BL/6J mice were randomized into three experimental groups: a sedentary control group, a HIIT group, and a HIIT plus intranasal creatine (HIIT+Cr) group. Over a 29-day interventional period, the HIIT+Cr group received intranasal creatine administration five days per week. The HIIT regimen comprised three weekly sessions on a motorized treadmill. Body weight was monitored throughout. BrdU was administered on alternate days. Following the intervention, brain sections were processed for immunohistochemistry to examine neurogenesis and assess hypothalamic neuroinflammation.

Results: Compared to baseline, HIIT mice exhibited a significant improvement in physical performance and a significant reduction in body weight compared to the control group. Furthermore, immunohistochemical analyses revealed observable modulations in both adult hypothalamic neurogenesis and the inflammatory profile.

Poster - IDa056

From Movement Behaviors to Academic Performance: The Serial Mediating Role of Cardiorespiratory Fitness and Executive Functions

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Adolescents' daily movement patterns, including physical activity, screen time, and sleep, may play an important role in academic-related cognitive outcomes. However, the mechanisms linking compliance with the 24-hour Movement Guidelines to arithmetic fluency remain insufficiently understood. This study analyzed 595 Spanish adolescents to examine whether cardiorespiratory fitness and executive functions sequentially mediate the relationship between compliance with physical activity, screen time, and sleep recommendations and arithmetic fluency. Physical activity and sleep were assessed using accelerometry, screen time was measured through a questionnaire, cardiorespiratory fitness was evaluated with the ALPHA-Fitness test battery, executive functions were assessed using NIH Toolbox software, and arithmetic fluency was measured with the Woodcock test 6. Compliance with the guidelines was categorized into three groups, using the lowest compliance group as the reference category. Results showed that adolescents in the higher compliance groups presented greater cardiorespiratory fitness, which was positively associated with executive functions. In turn, both cardiorespiratory fitness and executive functions were positively related to arithmetic fluency. Significant indirect effects were found through cardiorespiratory fitness alone and through the serial pathway from cardiorespiratory fitness to executive functions, whereas the indirect effect through executive functions alone was not significant. These findings suggest that adolescents who comply with more physical activity, screen time, and sleep recommendations may achieve better arithmetic fluency partly because they show higher cardiorespiratory fitness, which is also linked to better executive functioning. Promoting healthy 24-hour movement behaviors may support arithmetic learning by fostering both physical and cognitive pathways.

Poster - IDa057

Personality shapes motivation but not psychological outcomes in older adults: evidence from the PRO-Training randomized controlled trial

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Background

Personality traits are known to influence motivational processes, yet their role in shaping psychological responses to exercise interventions remains unclear in older adults. The aim of this study was to examine whether personality traits are associated with motivation and whether they predict changes in depressive symptoms and anxiety over time.

Methods

A total of 120 older adults (60–75 years) were randomized into five groups: supervised with motivation (SUP+), supervised without motivation (SUP), unsupervised with motivation (UNSUP+), unsupervised without motivation (UNSUP), and control (CON). All exercise groups participated in a 24-week multicomponent training program comprising three 60-minute sessions per week. Baseline personality traits were assessed using the 60-item Big Five Inventory. Motivation was evaluated at baseline using the 24-item Behavioural Regulation in Exercise Questionnaire-3. Depressive symptoms and anxiety were assessed at baseline and post-intervention using the 15-item Geriatric Depression Scale (GDS-15) and the 20-item Zung Self-Rating Anxiety Scale. Linear regression analyses were conducted to examine associations between personality traits and motivation at baseline. Mixed-effects models were used to assess whether personality traits predicted changes in psychological outcomes over the 24-week intervention.

Results

Extraversion was positively associated with intrinsic motivation at baseline ($\beta = 0.31$, 95% CI [0.13, 0.48], $p < .001$). No other personality traits were significantly associated with motivation. However, no personality traits predicted changes in depressive symptoms or anxiety over the 24-week intervention (all $p > .10$). Supervised groups (SUP and SUP+) showed greater reductions in depressive symptoms compared to unsupervised groups.

Conclusion

Personality traits appear to influence motivation towards exercise in older adults but do not predict changes in depressive symptoms or anxiety following a structured exercise intervention. These findings suggest that intervention characteristics, such as supervision, may be more relevant than individual predispositions in determining psychological outcomes.

Poster - IDa058

Acute Aerobic Exercise Enhances Inhibition Across Anxiety Levels with Distinct Neural Effects

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Acute exercise is widely recognized as a factor that enhances cognitive performance. However, in young adults, these effects are often subtle due to typically high baseline cognitive functioning. At the same time, evidence suggests that individuals with high trait anxiety exhibit poorer cognitive performance and may benefit more from exercise.

This study examined whether a single session of moderate-intensity aerobic exercise improves inhibitory control and its neural correlates—specifically the N2 and P3b components measured during a Flanker task—in high trait anxiety (HA; n = 37) and low trait anxiety (LA; n = 37) groups.

A randomized, counterbalanced, cross-over, partially blinded design was used. Each participant completed a 20-minute moderate-intensity cycling session (65–75% HRmax) and a 20-minute seated rest condition. Inhibitory control was assessed before and after each condition using a modified Flanker task, with behavioral (accuracy, RT) and event-related potential measures.

Results showed improved behavioral performance following exercise in both groups, reflected in increased accuracy for incongruent stimuli. Neural measures revealed increased N2 amplitude after exercise in the HA group, independent of congruency. The other effects were not significant.

Overall, these findings suggest that moderate-intensity acute exercise benefits behavioral markers of inhibition, even in a population considered to be at peak cognitive performance and regardless of anxiety levels. However, additional neural benefits may be observed in more anxious individuals, possibly indicating greater neural responsiveness to exercise in this vulnerable population.

Poster - IDa060

Effects of different types of exercise training on intra-individual variability in cognitive performance in older adults with mild cognitive impairment

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Mild cognitive impairment (MCI) is a prodromal stage of dementia, accompanied by subtle changes in cognitive performance. One aspect of cognition which may be affected by MCI is intraindividual variability(IIV): the within-person variability across trials in a neuropsychological test, wherein higher IIV is indicative of lapses of attention or executive control. Exercise is a promising strategy to promote cognitive outcomes– including IIV –in older adults with MCI, with key modalities being aerobic training (AT) and resistance training (RT). However, no study has examined the individual and combined effects of AT and RT on cognitive function in older adults with MCI.

We conducted a secondary analysis of a 6-month 2x2 factorial arm randomized controlled trial with older adults with MCI. Participants were randomized to either: balance & tone (BAT; control); AT+BAT; RT+BAT; or AT+RT. IIV was indexed using the residual intraindividual standard deviation (rISD) for the: Flanker Test (congruent and incongruent conditions), and Dimensional Card Change Sort (DCCS) Test. We examined the main effects of AT and RT, and the interaction effect of AT+RT at 6-months using planned contrasts, adjusting for age, sex, baseline Montreal Cognitive Assessment score, baseline outcome, and COVID-19 impact.

Two-hundred and twenty-six participants (mean age of 74±6 years; 56.1% females) were randomized. Using complete case analysis, we observed a significant interaction effect of AT+RT on rISD for the Flanker Test incongruent condition (est= -1.954, p= 0.018), such that 6-months of combined AT+RT had lower rISD on Flanker incongruent condition than the AT or RT groups(estimated marginal means [95% CI]: AT+RT: 2.75 [1.40 to 4.10]; RT: 4.43 [3.07 to 5.79]; AT: 5.43 [3.99 to 6.86]). No interaction or main effects were observed for the Flanker Test congruent condition or DCCS Test.

Thus, targeting both AT+RT might be more beneficial for improving cognitive function, than AT or RT alone.

Poster - IDa061

Executive Functions in Closed- and Open-Skill Sports: Protocol for a Descriptive and Inferential Pilot Study in Competitive Youth Athletes

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Physical activity has been consistently associated with the development of executive functions (EF) in in children, contributing not only to cognitive and mental health outcomes but also potentially enhancing athletic performance in elite populations. Emerging evidence suggests that open-skill (OS) sports, characterized by dynamic and unpredictable environments, may confer greater benefits to EF compared to closed-skill (CS) sports. Additionally, specific EF components, such as working memory, have been linked to performance in disciplines like artistic gymnastics. However, research in competitive youth populations remains scarce, particularly studies that account for the distinct physical and cognitive demands of different sports and apparatus.

This study presents a 12-week pilot protocol with a descriptive and inferential design. The primary objective is to compare EF performance and physical activity levels among three groups: athletes engaged in CS individual sports (artistic gymnastics), OS sports (tennis), and a sedentary control group. Secondary objectives include analyzing the association between EF and both overall and apparatus-specific performance in gymnasts aged 6–12 years, as well as exploring potential sex differences in EF.

Executive functions will be assessed using standardized cognitive tasks (Stroop, Go/No-Go, and 2-back) administered via the CogniFit platform. Physical activity will be measured through the Physical Activity Questionnaire for Children (PAQ-C) and accelerometer recordings. Gymnastics performance will be obtained from official competition scores. Statistical analyses will be conducted using JASP software (version 0.18.30).

Conducted within a doctoral program at the Institute of Sport Research of the Autonomous University of Barcelona, this study, aims to generate preliminary evidence on the relationship between EF and sport performance in young athletes. Findings may inform the design of evidence-based training strategies and early specialization approaches that optimize both cognitive development and athletic performance, while promoting lifelong brain and mental health.

Poster - IDa062

Differences in mental health outcomes in IPVAW survivors considering hits to the head exposure

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Introduction: Intimate partner violence against women (IPVAW) is a serious social and public health problem. Between 70% and 92% of women who have experienced IPVAWreport being hit on the head (Dams-O'Connor et al., 2023), which is linked to mental health problems such as depression, anxiety, and PTSD. However, most studies are limited and rarely examine Complex PTSD (CPTSD).

Methods: The study included 301 women divided into five groups. Three IPVAW victims groups: survivors with a history of hits to the head by their partner (IPVAW_HITS, n = 95), victims with hits to the head from other causes (IPVAW_oHITS, n = 43), and victims without hits to the head (IPVAW_nHITS, n = 60); and two groups of non-victimized women: those with hits to the head from other causes (NV_HITS, n = 46) and those without hits to the head (NV_nHITS, n = 57). Participants completed assessments of depression (PHQ-9), anxiety (GAD-7), PTSD (PCL-5), CPTSD (ITQ), and adverse childhood experiences (ACE). ANCOVAs and chi-square tests were used to compare differences between groups, introducing ACE as a covariate.

Results: The IPVAW_HITS group exhibited a severe psychopathological profile across all domains, including depression ($F = 10.33$; $p < .001$), anxiety ($F = 6.58$; $p < .001$), and PTSD ($F = 18.69$; $p < .001$), with a descending pattern observed in the IPVAW_oHITS group, followed by the IPVAW_nHITS, the NV_HITS, and finally the NV group. This pattern was also reflected in the prevalence of CPTSD diagnosis ($\chi^2=31.03$; $p< .001$), which was highest in the IPVAW_HITS group (41%).

Conclusions: Survivors of IPVAW show a broad psychopathological profile, and those who have suffered hits to the head present greater severity in their clinical symptoms. These findings highlight the need to integrate both TBI screening protocols and psychological assessments into IPVAW victim support services in order to ensure personalized and effective interventions.

Poster - IDa063

Relationship between hits to the head and immune dysregulation in women exposed to intimate partner violence.

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Introduction: Intimate partner violence against women (IPVAW) is a major social and public health problem worldwide, which affects mental, cognitive, and physical health (WHO., 2024). In addition, many of these women experience hits to the head that may worsen these consequences (Iverson et al., 2019). This violence can lead to systemic inflammation causing impaired lymphocyte, monocyte and neutrophil activity (Muscaritoli et al., 2025).

Methods: The study included 98 women distributed into three groups: IPVAW victims with a history of hits to the head by their partner (IPVAW_HITS, n = 30), IPVAW victims without hits to their head by their partner (IPVAW_nHITS, n = 29), and non-victims (NV, n = 39). Blood samples were collected and absolute lymphocyte, monocyte and neutrophile counts, as well as immunological indices such as neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), monocyte-to-lymphocyte ratio (MLR) were assessed.

Group differences were analyzed using ANCOVAs; and within the IPVAW_HITS group, partial Spearman correlations assessed associations between hits to the head and inflammatory markers, controlling for age.

Results: The IPVAW_HITS group exhibited higher absolute neutrophil (F=6.78; p = .046) and lymphocyte counts (F=4.90; p = .010), followed by the IPVAW_nHITS group. Regarding immunological indexes, the IPVAW_HITS group showed lower PLR values, followed by the IPVAW_nHITS group (F= 3.54; p = .046). Within the IPVAW_HITS group, the number of head impacts was positively associated with neutrophil (r=.264; p = .010) and lymphocyte counts (r=.237; p = .021), and negatively associated with PLR (r=-.232; p = .024).

Conclusion: Women exposed to IPVAW, particularly those who experienced hits to the head, exhibited a peripheral inflammatory profile that was significantly different from non-victims. Moreover, greater exposure to such impacts was associated with potential immune alterations. Future studies in IPVAW populations could examine whether non-IPVAW-related head impacts (e.g., in athletes) are associated with similar immunological alterations.

Poster - IDa064

Assessing an inclusive lifestyle-based intervention program that supports individuals living with chronic neurological conditions, their care partners and healthy agers.

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With rising prevalence of chronic neurological conditions, there is a need to establish programs that are accessible, holistic and barrier free to sustain quality of life and to promote healthy aging even in the face of underlying brain conditions. The BCBWP was launched in 2019 as an extension to clinical activities at the outpatient clinics of the Djavad Mowafaghian Centre for Brain Health at the University of British Columbia. The BCBWP supports individuals throughout British Columbia living with chronic brain conditions, their care partners, and older adults with lifestyle-based interventions for prevention and holistic health management. The BCBWP offers group programming that is function-based rather than condition-specific, requires no referral, and is free of charge.

When joining the program, participants sign up for an individual online functional assessment, which includes outcome measures validated for use in a virtual health setting. The participants are offered an evidence-informed selection of approximately 30 live online classes each semester including exercise, nutrition, cognitive health, music, arts, coping skills, and care partner classes as well as educational events offered by an interdisciplinary team. Participant retention is monitored through attendance. Surveys are sent out upon intake and at the end of each term to collect participant reported benefits and satisfaction rate on the program.

1,418 participants have participated in BCBWP in 2025. 97% of participants have reported high program satisfaction, and 98% reported perceived benefits in physical, cognitive, mental, and social health as well as improved condition management. The BCBWP has effectively implemented an innovative, group-based model aimed at enhancing well-being and functional outcomes for individuals living with chronic brain conditions, their care partners, and healthy agers.

Poster - IDa065

Physical Literacy and Its Relationship with Mental Health Outcomes in children and adolescents: A Systematic Review

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Physical literacy (PL), encompassing physical, affective, and cognitive domains, has been identified as a key determinant of lifelong physical activity and physical health. Emerging evidence suggests that PL may also play an important role in shaping mental and social well-being during childhood and adolescence, yet the evidence remains fragmented. This systematic review synthesized empirical evidence on the association between PL and mental health outcomes in children and adolescents. Following PRISMA guidelines and a protocol registered in INPLASY, a comprehensive search of six electronic databases was conducted for studies published between 2000 and 2025. Observational studies involving apparently healthy participants aged 5–17 years that examined associations between PL and mental health outcomes using validated PL measures were included. Fourteen studies comprising 6,982 participants from nine countries met the inclusion criteria. Overall, higher PL was consistently associated with fewer internalizing symptoms, including depression, anxiety, stress, loneliness, and negative affect, as well as fewer externalizing symptoms such as behavioral problems, aggression, and hostility. Positive associations were also observed between PL and indicators of mental well-being, including resilience, quality of life, vitality, self-esteem, life satisfaction, happiness, enjoyment, and overall mental health. Social well-being outcomes, particularly prosocial behavior and peer relationships, were likewise positively associated with PL. Although the overall risk of bias was low, effect sizes were small and evidence was predominantly cross-sectional, with considerable heterogeneity in PL measurement. These findings highlight PL as a promising correlate of mental and social well-being in youth while underscoring the need for longitudinal and intervention-based research.

Poster - IDa066

Sex-specific phenotypic risk clusters and the CAIDE Paradox in dementia prevention: baseline findings from CITA GO-ON

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Background: Multidomain dementia prevention trials often utilize uniform inclusion criteria, such as the CAIDE score. However, the CAIDE scale awards a point for male sex, potentially masking a higher burden of modifiable factors in women with similar total scores ("CAIDE Paradox"). We characterized the divergent baseline risk architectures of male and female participants entering a multidomain dementia-prevention trial to identify sex-specific intervention priorities.

Methods. We analysed baseline data from 920 older adults (69.55±6.19 years; 48.3% women) randomized in CITA GO-ON (60-85 years; CAIDE ≥6; cognitive underperformance). Ten modifiable indicators were compared across the cardiovascular (BMI, blood pressure, total cholesterol), lifestyle (alcohol intake, ever-smoker prevalence, Mediterranean diet adherence [PREDIMED], sleep quality [Pittsburgh Sleep Quality Index]), socioemotional (anxiety and depression [Goldberg´s Anxiety and Depression Scale], and physical function (30-s sit-to-stand) domains. Sex differences were tested with Welch's t-tests and quantified via Cohen's d effect sizes to assess clinical relevance.

Results. Despite equivalent total CAIDE scores, participants displayed divergent risk profiles. Men exhibited a profile characterized by higher cardiovascular and lifestyle-related risks, including greater BMI (d=0.17), systolic blood pressure (d=0.15), and hazardous alcohol intake (d=0.65), alongside superior relative physical function (d=0.32). In contrast, the female profile was dominated by a significantly higher dyslipidemic burden (total cholesterol d=0.76) and a heavier socioemotional and perceptual load, with markedly higher anxiety (d=0.46), depression (d=0.42) and poorer subjective sleep quality (d=0.56), as well as lower educational reserve ($p<0.001$). Mediterranean diet adherence was similar. Conclusion. Identical dementia risk scores encapsulate fundamentally different clinical drivers. The "CAIDE Paradox" masks a profile in women that is characterized by lower educational reserve, and greater dyslipidemic and socioemotional burden. These findings underscore the need for sex-stratified prevention strategies that prioritize vascular-toxic control in men while addressing the

lipid and socioemotional axis in women to maximize the impact of multidomain trials.

Poster - IDa069

Ameliorating aging-associated cognitive decline by exercise: systemic integrated adaptive response.

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Regular exercise ameliorates processes of aging, including chronic inflammation, mitochondrial dysfunction and insulin resistance, and exerts positive effects on brain plasticity. However, knowledge of underlying mechanisms is still limited, and exercise is rarely implemented in clinical practice. Aim of our studies is to (i) identify putative molecular mediators of exercise-induced systemic adaptations, and to (ii) demonstrate efficiency and long-term sustainability of exercise interventions in older adults.

RCTs EMBRACE (n=64) and AMETHYST (n=50) explore the effects of 3 and 9-month supervised aerobic-strength interventions and stretching (control) (3x1h/week); and effects of a long term (≥5yrs) supervised training (2x1h/week) on cognitive functions (ACE-R/DSST/TMT-A&B Cogstate), functional capacity (dynamometry/motor tests), brain (MRI&S: brain volumetry/DTI/ fMRI), muscle (P-MR spectroscopy) and systemic metabolism (oGTT, euglycemic hyperinsulinemic clamp) in older adults. Cerebrospinal fluid/CSF and plasma samples were obtained before and after interventions.

Exercise improved cognitive functions (ACE-R total score, memory domain, $p<0.05$), functional capacity (muscle strength, motor tests, $p<0.05$), anthropometric and metabolic parameters ($p<0.05$) in the intervention compared to the stretching control group, with more pronounced effects in individuals with mild MCI. Effects on cognition and metabolism were maintained over the 5-year follow-up in a subpopulation of those who continued to exercise regularly. Longer exercise training (≥1yr, 2x1h/yr) distinctively modulated volume of several brain areas. Changes in clinical parameters were paralleled by distinct changes in the molecular profile in circulation.

We demonstrated the efficiency and sustainability of supervised aerobic-strength training in older adults. Exercise-induced regulations of circulating bioactive molecules suggest their potential role in the adaptive response to exercise. Participation in the TEIDe consortium provides an excellent opportunity to generate robust evidence and be a part of an excellent interdisciplinary multinational network, with the ultimate goal to implement individualized exercise prescriptions in clinical practice.

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Poster - IDa070

The acute effects of dance on cognition and mobility in older adults: a pilot study

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The objective of this study was to compare the immediate effects of dance to aerobic training and a passive control condition on cognition and mobility in older adults. Fifteen females (72.4 ± 5.0 years old) completed a within-subject cross-over design with 3 sessions scheduled 1 week apart. Participants were randomized to 1 of 3 sequences (Control-C, Aerobic-A, Dance-D: CAD, ADC, DCA). Testing was conducted pre and post each training session. Cognitive (Stroop and Random Number Generation-RNG) as well as mobility performances (balance and gait speed) were assessed. In addition, affect (Rejeski's scale) and workload (NASA-TLX) were measured. Two-way ANOVAs (time*session) were performed, and effect sizes (Hedges'grm) were calculated. Reaction time (Stroop) differed across conditions (counting < inhibition < non switching < switching). A time effect and a time by session interaction were noted. Reaction time was faster after each session with larger effect sizes following sessions A and D compared with C (A: $-0.27 \leq g \leq -0.12$; D: $-0.27 \leq g \leq -0.25$; C: $-0.15 \leq g \leq 0.09$). For RNG, a time effect was observed for Runs (inhibition). Effect sizes suggest these improvements were limited to experimental sessions (C: $g = 0.13$; A: $g = -0.45$; D: $g = -0.23$). For mobility outcomes, no significant time effect was observed, and the time by session interaction was not significant. Mental load was higher after D (D > A > C) while physical load was higher after A (A > D > C). Affect was higher after C (C > D > A). Results suggest that exercise can lead to acute cognitive benefits without compromising mobility.

Poster - IDa071

Thinking while walking: Performance on executive functioning dual-tasks in adults with and without ADHD

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Executive functions are higher order forms of cognition that humans use every day to regulate behavior and actions. Such behaviors and actions are rarely completed in isolation as thinking often occurs with concurrent movement. These facets can be indexed with the dual-task paradigm. Previous research has identified that walking can differentially impact dual-task performance across the various types of executive functions. However, limited research has examined adults with and without ADHD in the context of all three executive functions. Therefore, we examined task performance in working memory (NBack 3-back), inhibition (Stroop), and switching (local-global) tasks across three movement conditions (sitting, standing, walking) in N = 58 adults (n = 29 typically developing; n = 29 confirmed ADHD). All participants completed a series of questionnaires and had their brain activity recorded via mobile EEG during executive functioning tasks. A MANOVA of behavioral accuracy indicated that the ADHD group had descriptively lower accuracy in all tasks and conditions, supported by a significant between-group difference [$F(56, 1) = 5.09$, $p = .028$]. Significant effects were also found by executive functioning task type [$F(54, 2) = 84.65$, $p < .001$] and movement condition [$F(54, 2) = 4.64$, $p = .014$]. Non-significant but descriptive differences were implicated in the degree of dual-task costs, which were more favorable in the ADHD group. Notably, executive functioning task performance did not correlate significantly with age or the reported number of physically active days in the last week. Collectively, this indicates that executive functioning performance was most impacted by walking in switching and working memory tasks overall. Furthermore, adults with ADHD had lower baseline accuracy but also showed a descriptively reduced degree of performance losses in the dual-task, potentially due to behavioral compensation. Further explanations will be drawn from EEG data.

Poster - IDa072

An intergenerational cognitive-physical activity program for mild cognitive impairment: cognitive, behavioural and psychosocial outcomes

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Background
Multicomponent interventions combining physical, cognitive and social stimulation may support brain health in older adults with mild cognitive impairment (MCI). Intergenerational formats may further enhance motivation, connectedness and sustainable behaviour change. This study examined cognitive, behavioural and psychosocial outcomes of the 12-week Brain in Motion program, an intergenerational cognitive-physical activity intervention based on the Ronnie Gardiner Method (RGM©), a multisensory, socially engaging rhythm- and music-based training approach.

Methods
A quasi-experimental pretest-posttest control group design was used (n=18; 13 intervention, 5 control; mean age 70.3±6.4 years; 42% female). Participants with MCI attended 12 weekly group sessions together with their adult child, complemented by home-based exercises and motivational interviewing. Cognitive performance was assessed using the CANTAB battery. Physical (in)activity and sleep were measured using wrist-worn accelerometry. Intention-to-treat linear mixed models adjusted for age and sex examined Group×Time effects. Post-intervention process evaluation questionnaires explored perceived psychosocial impact and program experiences.

Results
Compared with controls, intervention participants showed greater improvement in visual recognition memory (β=1.39, p=.050). Moderate-intensity physical activity increased (+53.8 min/day, p=.008), inactivity decreased (-66.1 min/day, p=.021), and total sleep time increased (+45 min/night, p=.037). Participant-reported findings reinforced these results: 90% of participants reported feeling more connected to their adult child, 89% reported increased motivation for physical activity, 82% greater cognitive engagement, and 64% improved mental well-being and quality of life. Adult children and partners also reported perceived gains in activity, well-being and family connectedness, with 100% indicating they would recommend the program.

Conclusions
An intergenerational, multisensory RGM-based program may support brain health in MCI through improvements in visual memory, movement behaviours and psychosocial well-being. Combining physical, cognitive and social stimulation within a socially engaging and family-oriented context appears to be a promising strategy to promote sustainable engagement and quality of life in early cognitive decline.

Poster - IDa074

Cognitively enriched handball training improves executive functions and academic performance in prepubertal schoolchildren

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Cognitively enriched sport-based training may represent a feasible strategy to support brain health and school-related learning during childhood. This study reports findings from the 2024 pilot phase of the Sport+EF Project, designed to examine whether intentionally increasing the cognitive demands of sport enhances its effects on executive functions and academic performance in prepubertal schoolchildren.

This 12-week pilot study used a quasi-experimental pretest-posttest design. A total of 59 schoolchildren (mean age: 9.40 ± 0.49 years) participated in a control group (n=28), traditional handball (n=14), or cognitively enriched handball (n=17). Intervention participants were randomly assigned to traditional or cognitively enriched handball. The intervention was delivered three times per week, 90 min/session, totaling 270 min/week of extracurricular handball, in addition to regular physical education classes, which remained unchanged for all groups. Executive functions were assessed using the Neuropsychological Assessment of Executive Functions in Children battery (ENFEN), academic performance using the Reading Comprehension Test (LECTUM) and the Early Grade Mathematics Assessment (EGMA), and physical activity level using the Physical Activity Questionnaire for Older Children (PAQ-C). Additional measures included physical fitness and anthropometric parameters. Outcome assessors were blinded to group assignment. At baseline, groups were comparable in executive function and anthropometric measures; only PAQ-C ($p=0.041$) and reading comprehension ($p=0.002$) were significantly higher in controls.

After 12 weeks, both handball groups improved significantly across all ENFEN tasks, whereas controls declined in five of six measures. The cognitively enriched group showed greater pre-post improvements, particularly in semantic fluency, color trails, and interference control. Academic outcomes followed the same pattern: both intervention groups improved in LECTUM and EGMA total score, whereas controls declined in both. Physical activity level also increased in both intervention groups.

These findings suggest that deliberately manipulating the cognitive demands of sport may strengthen its benefits for executive functioning and academic learning in educational settings.

Poster - IDa075

Determinants of cognitive decline during acute hospitalization in older adults: a longitudinal analysis

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Introduction: Acute hospitalization has been associated with accelerated cognitive decline in older adults. Pre-existing characteristics such as advanced age, comorbidities, and pre-admission cognitive impairment are considered relevant risk factors. However, factors related to functional status and physical activity behaviors during hospitalization remain underexplored. This study aimed to identify the main predictors of cognitive decline during acute hospitalization.

Methods: For this longitudinal analysis, older adults aged ≥ 65 years and admitted to a public hospital (University Hospital of Navarre, Spain) for acute medical conditions were included. Functional status was assessed using Barthel Index and Short Physical Performance Battery (SPPB), while cognitive state was evaluated using Mini-Mental State Examination (MMSE). Sedentarism, physical activity, sleep quantity, and quality of sleep were measured using accelerometry. Linear regression analyses were performed to identify significant predictors of cognitive decline during hospitalization.

Results: A total of 40 participants (mean age 81.88 ± 7.06, 25 men and 15 women) were included. During hospitalization, MMSE score worsened (≥ 2-point decrease) in 27.5% of participants, SPPB worsened (≥ 1-point decrease) in 32.5% of participants, and Barthel Index worsened (≥5-point decrease) in 42.5% of participants. After adjusting for age, baseline cognitive status, and hospitalization duration, linear regression analyses showed that Barthel Index at admission ($p = 0.002$) and sleep quality during hospitalization ($p = 0.017$) were significantly associated with cognitive state at discharge.

Conclusion: This study reveals that functional status at admission and sleep quality during hospitalization may be relevant predictors of cognitive decline during hospitalization. These findings may contribute to the risk stratification of acutely hospitalized older adults.

Keywords: older adults, hospitalization, cognitive decline, sleep.

Poster - IDa076

Effects of Concurrent Exercise on Cognitive Inhibition in Adolescents

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This study investigates whether a structured concurrent exercise program can enhance cognitive functions such as attention in adolescents. Physical activity and fitness are positively associated with cognitive processes and academic performance during adolescence, a critical period for brain development. Attention and memory are essential for behavioral regulation and learning, making their optimization particularly relevant in this population.

A randomized controlled trial was conducted with 60 adolescents assigned to either an experimental group or a control group. The experimental group participated in a nine-week concurrent training program combining resistance and endurance exercises three times per week, while the control group maintained their usual routines. Inhibitory control was assessed pre- and post-intervention using the Stroop test. Physical fitness and lifestyle factors, including sleep and diet quality, were also evaluated.

Mixed-effects models revealed a significant reduction in the Stroop effect over time ($F(1, 52.47) = 9.44$, $p = .003$), indicating improved inhibitory control. The experimental group showed a significant improvement ($p = .021$, $d = 0.65$), while the control group showed a trend toward improvement ($p = .055$, $d = 0.54$). However, no significant between-group differences were observed. Model fit indices indicated that fixed effects explained a small proportion of variance (marginal $R^2 = 0.057$), while the full model accounted for a larger proportion (conditional $R^2 = 0.604$).

Analyses including sex showed a significant time effect ($F(1, 50.28) = 10.96$, $p = .0017$), but no significant group or interaction effects. Although some sex-specific patterns emerged, these did not support a differential effect of the intervention. Model fit remained similar (marginal $R^2 = 0.078$; conditional $R^2 = 0.622$).

In conclusion, although inhibitory control improved over time, the concurrent exercise program did not show a clear advantage over usual activity. These findings may suggest that longer intervention periods, higher training adherence, or more tightly controlled exercise doses are necessary to elicit more robust cognitive effects during adolescence.

Poster - IDa078

Evaluation of a working memory training with and without physical exercise on executive function in a military cohort

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Executive functions are essential for the flawless performance required of individuals in a military environment. In Switzerland, all men aged from 18 years are required to complete 18 weeks of basic military training. Military life is characterized by high levels of physical and psychological stress, sleep deprivation and time pressure. All these factors can impair executive functions, which is why it is crucial to identify factors that may potentially enhance these functions. Previous research has shown that both physical exercise and cognitive training have potential to improve executive functions. However, few studies have examined the effect of cognitive training, physical exercise or the combination of both on executive function in a military setting. We therefore aimed to investigate the effects of a working memory training with and without antecedent physical exercise on executive functions. Our sample comprised 134 male recruits from an infantry school with an average age of 19.8 years. Participants were randomly assigned to two intervention groups completing 21 sessions of 15 min working memory training or 15 min working memory training with 15 min antecedent exercise or a control group in a 1:1:1 ratio. Before and after the eight-week intervention, they performed computerized versions of the spatial 2-back task and the Flanker task. Analyses using linear mixed models showed no differences in changes from pre- to posttest in working memory and inhibitory control between the intervention groups compared to the control group. While cognitive training and physical exercise have been shown to enhance executive function in different contexts, these effects do not seem to generalize to the military setting.

Poster - IDa080

How duration and intensity of physical activity influence the association of stroke and higher-order cognition in older adults

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Stroke is a leading cause of global disability, with post-stroke cognitive impairment affecting up to 60% of survivors. While physical activity (PA) is a known modulator of cognitive health, the specific roles of PA intensity and duration for executive function (EF) and memory in stroke survivors remain unclear. This study aimed to examine the association of stroke and higher-order cognitive function as well as its mediation by PA intensity and duration. We employed a cross-sectional design using data from the National Health and Nutrition Examination Survey (NHANES) 2011–2014 cycles. 2,523 participants (178 with stroke history) aged ≥ 60 with valid accelerometer and cognitive data were analyzed. PA was quantified via the Intensity Gradient (IG) and overall duration over a 24-h cycle (> 40 mg). Cognition was assessed using the Digit Symbol Substitution Test (DSST), Animal Fluency, and CERAD Delayed Recall tests. Stroke history was associated with significant deficits in EF and reduced PA levels. Higher PA intensity showed small positive associations with both EF and memory, whereas duration showed little to no association. Intensity emerged as a mediator for EF, though effect sizes were trivial. Mediation effects for memory were statistically compatible with the null. PA intensity is more consistently linked to post-stroke cognition than duration. Older adults engaging in physical activity at higher intensities show better executive function and working memory. For executive function in particular, higher intensity physical activity seems to ameliorate the cognitive deficits that stroke survivors face. Clinical post-stroke protocols should prioritize increasing movement intensity to optimize cognitive outcome.

Poster - IDa081

Towards earlier identification of cognitive decline and its prevention through physical activity: The EMPICATExt project

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Early identification of cognitive decline and the development of effective preventive strategies are key challenges in ageing research. The EMPICATExt project, funded by the Regional Government of Extremadura (Spain) through European Union funds, aims to address these challenges by integrating physical activity and cognitive neuroscience approaches. The main objectives of EMPICATExt are: (i) to design novel procedures for earlier identification of brain-related functional decline; (ii) to develop more effective physical activity-based interventions to prevent cognitive deterioration; and (iii) to identify underlying mechanisms of both cognitive decline and the beneficial effects of physical activity.

To date, three empirical studies have been conducted within the project. The first study examined mental fatigability in older adults with equivalent Mini-Mental State Examination (MMSE) scores. Results showed significant differences in mental fatigability between physically active and sedentary individuals, suggesting that mental fatigability—defined as the duration over which an individual can sustain cognitive effort—may serve as a more sensitive early marker of cognitive decline than global cognitive screening measures.

The second study investigated the mechanisms underlying the cognitive benefits of physical activity. Findings indicated that these benefits are partially mediated by cardiometabolic biomarkers, highlighting the relevance of systemic physiological health in brain function and cognitive ageing.

The third study evaluated the effects of a combined intervention involving structured physical activity and Brain Endurance Training (BET) in a rural population. Results demonstrated significant improvements in cognitive performance following the intervention, supporting its potential applicability in underserved and rural contexts.

Overall, the evidence generated within EMPICATExt suggests that cognitive decline can be more sensitively detected through mental fatigability, and that physical activity exerts its cognitive benefits through cardiometabolic pathways and targeted training approaches. These findings contribute to a better understanding of the mechanisms underlying cognitive ageing and support the development of more precise and accessible preventive strategies.

Poster - IDa082

Combined physical and cognitive priming enhances subsequent cognitive performance and prefrontal oxygen saturation in Alzheimer's disease: Evidence from the EMPICAText Project

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Introduction: Priming refers to the phenomenon whereby prior exposure to a stimulus facilitates subsequent cognitive processing. To date, few studies have examined the effects of priming in Alzheimer's disease (AD).

Aim: The present study aimed to investigate the acute effects of combined physical and cognitive priming on cognitive performance and prefrontal cortex (PFC) oxygen saturation in patients with AD.

Method: Fourteen patients (8 females, 6 males) with AD (MMSE = 21.50) were recruited from a day care center for AD in Extremadura (Spain). Cognitive performance was assessed based on the number of correct responses within one minute on an incongruent Stroop test, while PFC oxygenation was measured using near-infrared spectroscopy (NIRS). Differences between a control (rest prior to testing) and a priming (10 min. of combined physical and cognitive tasks) condition were analyzed.

Results: The results showed a significant improvement in cognitive performance following the priming compared to the control condition ($p < .001$). Additionally, changes in cognitive performance were significantly associated with changes in PFC oxygen saturation in the right hemisphere ($p < .01$), but not in the left hemisphere.

Discussion: The observed benefits of priming are consistent with previous research suggesting that acute physical and cognitive stimulation can transiently enhance cognitive functioning (in other populations). The prefrontal cortex plays a central role in executive functions and cognitive control. The lateralized pattern observed may be explained by the dominant role of the right hemisphere in attentional processing.

Conclussion: Overall, these findings support that combined priming enhances cognitive performance in AD's patients. Also, findings suggest a lateralized neural mechanism underlying this effect. From a clinical perspective, these transient improvements in cognitive performance may be particularly relevant in AD, as they could support functioning in activities of daily living and optimize the effectiveness of interventions delivered in specialized care settings.

Poster - IDa083

Influence of 24-hour movement behaviors stability on academic performance and core executive functions

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Introduction: Brain health promotion has traditionally focused on the amount of physical activity or sleep. However, the stability of these habits (intra-subject variability) emerges as a key associated factor for the academic and cognitive performance of adolescents.

Objective: To analyze the association between the stability of moderate-to-vigorous physical activity (MVPA), sleep, and sedentary time across the week with academic performance and core executive functions in adolescents.

Methodology: Cross-sectional study with 966 adolescents (12.4 ± 0.7 years). MVPA, sleep, and sedentary time were measured via accelerometry. Stability was calculated as the Coefficient of Variation (CV) across a seven-day period. Academic performance was assessed via grade point average, and core executive function (cognitive flexibility, inhibition, and working memory) through the NIH-EXAMINER battery. Associations were analyzed using linear mixed models adjusted for age, sex, and the daily average of each behavior separately, including the classroom as a random effect.

Results: Regarding academic performance, greater instability (higher CV) in both MVPA and sleep was significantly associated with poorer grades, (β = -0.66, $p < 0.001$ and β = -1.41, $p < 0.001$, respectively). These associations remained significant even after controlling for daily averages. Specifically, while MVPA stability was linked to academic outcomes, average MVPA duration was not ($p = 0.590$). Cognitively, sleep instability was associated with poorer cognitive flexibility ($p = 0.019$). No further significant associations were found between the studied movement behaviors and core executive functions.

Conclusions: Stability in physical activity and sleep routines is fundamental for academic success, beyond the total amount. These findings suggest that brain health promotion strategies should prioritize not only the promotion of healthy habits but also their regularity and consistency throughout the days of the week.

Poster - IDa084

The Optimal Combination of Physical and Cognitive Activity in Older Adults to Promote Cognitive Functioning

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Although life expectancy has increased due to medical advances, there has not been a corresponding rise in healthy life expectancy without cognitive decline. There is growing evidence that combining physical and cognitive activity (PA + CA) can promote healthy cognitive ageing, yet the optimal combination of PA intensity and CA difficulty remains unclear. Clarifying tis balance is particularly important in ageing societies, as it may inform the design of effective interventions to prevent or delay cognitive decline.

The present study aims to identify which combination of PA intensity and CA difficulty yields the greatest acute cognitive benefits in healthy, community-dwelling older adults. Seventy-two adults aged 65 years and older with varying levels of cardiorespiratory fitness participated in a familiarization session to individually determine two PA intensity levels (light and moderate) and two CA difficulty levels (easy and challenging). PA intensity was defined using heart-rate zones based on heart-rate reserve, while CA difficulty was determined based on subjective difficulty ratings. Following familiarization, fifty-four participants completed four experimental conditions in a randomized order, combining PA and CA in a 2 x 2 design. Conditions were performed in a controlled laboratory setting during which participants walked on a treadmill while simultaneously performing cognitive tasks at the assigned difficulty level. Inhibition, cognitive flexibility, and complex attention were assessed before and after each condition. In addition, feasibility and enjoyment were evaluated after each session to assess participant engagement.

This study is the first to experimentally manipulate both PA intensity and CA difficulty within a controlled dual-task paradigm to identify the optimal PA + CA “dose” for acute cognitive enhancement. Results will be presented at the conference and are expected to advance current understanding of how PA + CA can be tailored to maximize short-term cognitive benefits and inform future applied research on brain health promotion.

Poster - IDa085

Correlates of Psychological Distress and Cognitive Function in Young Adults: Exploratory Findings from a Pilot Randomized Controlled Trial

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Background: Young adulthood is a formative period in which psychosocial demands and shifting lifestyle patterns may influence brain-health-related outcomes. Interventions targeting modifiable physical and mental factors may therefore be especially relevant during this stage, yet the contribution of these factors remains insufficiently understood. This study aimed to identify potentially modifiable factors associated with psychological distress and cognitive function within a trial of physical exercise and mind-body interventions.

Methods: This predefined exploratory analysis was conducted within a pilot three-arm randomized controlled trial. Fifty-three university students (aged 18-25 years) were assigned to Mindfulness-Based Stress Reduction (MBSR; n=18), Qigong (QG; n=18), or High-Intensity Functional Training (HIFT; n=17). Participants completed three online sessions per week for 12 weeks. Primary outcomes in the trial were psychological distress and cognitive domains, including attention/processing speed, executive function, and memory. Regression models were used to examine whether changes in mindfulness, self-esteem, sleep quality, physical activity, and cardiorespiratory fitness (CRF) were associated with changes in the primary outcomes.

Results: Greater improvements in sleep quality were associated with greater reductions in psychological distress in the MBSR group ($p = .021$) and the HIFT group ($p = .023$). Greater increases in self-esteem were also associated with greater reductions in psychological distress in the MBSR group ($p = .003$). In addition, greater increases in CRF were associated with greater improvements in executive function in the Qigong group ($p = .049$), whereas greater increases in moderate-to-vigorous physical activity were associated with greater improvements in executive function in the HIFT group ($p = .004$).

Conclusion: In this exploratory analysis, changes in psychological distress were associated with changes in sleep quality and self-esteem, whereas changes in executive function were associated with changes in CRF and moderate-to-vigorous physical activity in specific intervention groups. These associations should be confirmed in larger studies of young adults.

Poster - IDa086

The Impact of Movement Breaks on University Students' Cognitive Performance and Well-being: A Systematic Review

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Introduction: Students in university spend an average of 9 hours a day sitting, which is associated with mental fatigue, attention deficits, and increased cardiometabolic health risks. Prolonged mental exertion without breaks impairs executive functions and reduces motivation to learn. The aim of this review is to synthesize studies on the impact of active movement breaks taken during lectures on students' cognitive performance, psychological well-being, and academic success.
Methodology: Following PRISMA guidelines, two independent researchers assessed study quality using the CASP checklist. The review included 14 experimental studies (N > 900). The studies primarily used randomized crossover designs and controlled trials. Interventions lasted 5–15 minutes and included aerobic exercise, calisthenics, yoga, dance, or the use of active desks. The measured variables included cognitive functions (attention, working memory), psychological state (anxiety, stress, vitality), academic performance, and physiological indicators (heart rate variability, cortical activation).
Results: The results show that short movement breaks significantly improve on-task attention and reduce mind wandering at the end of a lecture. Active breaks (e.g., running or calisthenics) increased subjective vitality and reduced mental fatigue, with the effects lasting for at least 20 minutes after the lecture resumed. Moderate-intensity breaks (60–80% VO2 max) improved performance on math tests and increased reaction speed in attentional tasks. Neurobiologically, increased prefrontal cortex activation and dilation of blood vessels in the fundus of the eye were observed following exercise, indicating improved blood supply to the brain. Long-term (12-week) interventions improved students' resilience and decision-making ability.
Conclusions: Active movement breaks are a feasible and effective tool for integration into teaching, helping to offset the negative effects of a sedentary lifestyle. Optimal cognitive benefits are achieved with 10–15-minute sessions of moderate-intensity exercise. Universities are encouraged to systematically integrate movement breaks into their curricula to support students' mental health and academic performance.

Poster - IDa087

Delayed Improvements in Attention Following a Brief Active Break in Preschool Children

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Introduction: Early childhood is a critical period for the development of executive functions, particularly attention and inhibitory control. Although physical activity has been shown to improve cognitive functioning, evidence regarding the immediate effects of classroom-based active break interventions in pre-school children remains limited, particularly with regard to the timing of these effects.

Objective: To examine the immediate effects of an active break on attention and inhibitory control in 5-year-olds, before, immediately after, and 20 minutes after the intervention.

Methods: Thirty-two preschool children (mean age ≈5 years) from two state schools were assigned to an intervention group (IG; n = 16) or a control group (CG; n = 16). The IG undertook a 4-minute classroom-based active break involving functional Tabata-style exercises at moderate-to-vigorous intensity (20 s work/10 s rest), whilst the CG remained seated. Cognitive performance was assessed using a modified Flanker task at three time points: before an active break, immediately after, and 20 minutes later. Outcomes included total score, accuracy, and reaction time. Linear mixed-effects models and difference-in-differences (DiD) analyses were performed.

Results: No significant differences were observed between the groups at the various assessment time points. However, a significant interaction between group and time was found for the total score ($p = 0.035$). The DiD analyses revealed greater improvements in the IG compared with the CG at 20 minutes in terms of total score ($\Delta = 0.46$, $p = 0.026$) and accuracy ($\Delta = 3.52$, $p = 0.029$), but not immediately after the intervention. Reaction time improved in both groups, with no differences observed between them.

Conclusion: These results suggest that brief active breaks may improve attention and inhibitory control in pre-school children, with benefits emerging after a short period delay rather than immediately, highlighting their potential as a strategy to promote early cognitive development in educational settings.

Poster - IDa088

Physical Activity and Motor Competence in Relation to Working Memory Capacity in School-Aged Children: The Moderating Role of Preterm Birth

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Background. Very preterm birth (< 32 weeks of gestation) is a risk factor for impairments in working memory that persist into adolescence. These impairments affect learning, academic performance, and everyday functioning. While physical activity and motor competence can promote working memory in typically developing children, evidence in very preterm-born children remains limited. The present study examined the associations of moderate-to-vigorous physical activity (MVPA) and motor competence (MC) with working memory capacity (WMC), as well as their moderation by birth status.

Methods. The sample comprised very preterm (n = 65) and full-term born (n = 44) children aged 8 to 14 years (M = 10.67, SD = 1.66; 49.5% female). Visuospatial working memory was assessed using a bilateral Change Detection Task, with k-scores indexing working memory capacity. MVPA was extracted from a 7-day physical activity recall protocol, and motor competence was evaluated with the Movement Assessment Battery for Children (M-ABC, second edition).

Results. Children born very preterm showed significantly lower k-scores than full-term born peers, whereas no group differences were found for MVPA and MC. Higher motor competence was associated with greater WMC across both groups. In contrast, the association between MVPA and WMC was more pronounced in participants born very preterm compared to those born full-term.

Conclusion. Independent of the birth status, children and adolescents with higher motor competence show better visuospatial working memory. In addition, physical activity appears particularly relevant for working memory in very preterm-born children and adolescents, providing first indications that this vulnerable group may benefit from targeted physical activity interventions.

Poster - IDa089

Boosting positivity: Does acute aerobic exercise strengthen positive memory acquisition among healthy, inactive adults?

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Background: Exercise has well-established benefits for mental health, including improvements in affect and cognition. One proposed pathway underlying these effects is the modulation of emotional memory via neuroplasticity-related processes. This study investigates whether acute exercise facilitates positive memory acquisition and its transfer to affective state. A Cognitive Bias Modification (CBM)-Memory paradigm was used to induce a positive memory bias through repeated cued retrieval of verbal information. Exercise timing (before encoding vs. during consolidation) was manipulated to explore the optimal temporal window for maximizing these effects. In addition, exercise-induced biomarkers, including brain-derived neurotrophic factor (BDNF) and endocannabinoids (anandamide [AEA] and 2-arachidonoylglycerol [2-AG]), will be analyzed after completion of data collection.

Methods: To date, 36 relatively inactive healthy adults (≤1 exercise session/week) completed two lab sessions in a randomized, counterbalanced order. In the experimental condition, participants performed positive CBM-Memory combined with acute exercise (before or after CBM-Memory), while the control condition involved a duration-and context-matched rest period. Affect and memory for positive and negative words were tested both directly and 24-hours post intervention. A Bayesian sequential design was employed, with interim analyses conducted after each cohort of 24 participants. Data collection is ongoing, and we will present full results.

Results: Interim analyses indicate that the evidence is inconclusive (BF_{10} = 0.63), with the data slightly favoring the absence of an enhancing effect of exercise on positive word recall. There is no convincing evidence for differential effects of exercise timing (encoding vs. consolidation), and transfer to affect is inconclusive at this stage.

Conclusion: Current findings provide no clear support for an enhancing effect of acute exercise on positive

memory acquisition or affect within the CBM-Memory paradigm. While theoretical frameworks support a role for exercise-induced plasticity in modulating emotional memory, additional data are required to confirm whether these effects emerge with a larger sample.

Poster - IDa090

Association of muscular fitness and irritability in children with and without mood disorders

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Background:
Irritability is characterized by increased proneness to anger and aggressive responses. Clinically significant irritability is one of the most common reasons families seek psychiatric evaluation (Evans et al., 2023), because it has a predictive value for depression and anxiety disorders (Vidal-Ribas et al., 2016). Pathophysiological models link irritability to deficits in executive functioning, particularly inhibitory control (Brotman et al., 2017). Muscular fitness has been associated with executive function, suggesting a potential protective role. This study examined the association of irritability and muscular fitness, while considering the mediating role of inhibitory control in healthy youth and those with depression and anxiety.

Methods:
Cross-sectional analyses were conducted with a sample of the Healthy Brain Network (n = 238, 12.6 ± 2.9 years), including 119 healthy and 119 age- and sex-matched youth with depression and anxiety. Irritability was assessed using the parent-reported Affective Reactivity Index. Muscular fitness was indexed using a composite score derived from z-standardized FitnessGram measures (grip strength, push-ups, curl-ups, trunk lift). Inhibitory control was assessed using the z-standardized Flanker task from the NIH Toolbox.

Results:
Path analysis revealed a small negative association between muscular fitness and irritability ($\beta = -.21$, $p = .047$) in the clinical group after controlling for age, sex, and BMI. This association indicated that participants with higher muscular fitness had lower parent-reported irritability. However, this association was independent of inhibitory control.

Conclusion:
Muscular fitness was inversely associated with irritability among youth with depression and anxiety disorders, but not among healthy controls. No mediating effect of inhibitory control was observed, indicating that other mechanisms may underlie this relationship. Overall, greater muscular fitness may be linked to enhanced resilience to irritability in youth with mood disorders.

Poster - IDa091

The Dynamics of Physical Activity and Affect: Investigating Memory-Based Event Appraisal as Potential Mechanism

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Background. It is well-known that physical activity in needed for brain- and mental health, but still 30% of adults do not meet the prescribed activity level (150 minutes/week; WHO, 2022). The uptake of physical activity is hampered by limited understanding of how it improves mental health. Insight into mechanisms will aid psychoeducation about the benefits of physical activity and targeted intervention design. In a longitudinal cohort study, we examined the relation between objective physical activity and affect and whether emotional memory mediates this association. Positive emotional memory is a hallmark feature and mechanisms of mental health as it represents adaptive brain-based emotional regulation skills.
Methods. In the Healthy Brain Study, 209 adults aged 30–40 were following for one year, implementing three burst-weeks of ecological momentary assessment and accelerometry (pre-registration: osf.io/593ac). Physical activity, defined as continuous movement, was assessed with an activPal, while affect and emotional memory were measured via smartphone-based surveys (3x6 days, 10 prompts/day).
Results. More recent physical activity (i.e., active minutes in the last hour) was associated with higher positive and lower negative affect, both in the moment as well as up to three hours later. Longer physical activity duration was also associated with more positive appraisal of recalled recent events, which was in turn associated with better affect in that moment as well as a few hours later. Pre-existing depressive and anxiety symptoms did not moderate these contemporaneous and temporaneous associations. This mediation pattern indicates that emotional memory processing partly explains how physical activity influences affect, independent of emotional mental health symptoms.
Discussion. These findings suggest that self-initiated physical activity may support mental well-being by shaping our memory of recent emotional experiences, possibly through improved emotional regulation. These insights help pave the way for personalized interventions and prevention strategies to optimize mental and cognitive health.

Poster - IDa092

Effects of a multicomponent exercise program on muscle function in patients with severe mental illness: A randomized controlled trial.

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Introduction:

Individuals with severe mental illness (SMI) frequently exhibit physical deconditioning compared to the general population, contributing to an increased risk of adverse events. Evidence suggests that structured physical exercise can improve physical performance in patients with SMI.

Objective:

To evaluate the impact of a short-term exercise program on muscle function among middle-aged adults with SMI.

Methods:

Patients from the Mental Health Rehabilitation Center at the Hospital Universitario de Navarra were randomly assigned to an intervention group (IG) or the control group (CG). The CG received standard medical care, whereas the IG completed an individualized 6-week, twice-weekly multicomponent exercise program. Changes in muscle function were assessed by maximal strength (1RM) and muscle power output outcomes in leg press, knee extension, chest press, and seated row exercises.

Results:

A total of 51 participants were included in the study (IG, n=25; CG, n=26). Participants were primarily male (64.7%) with a mean age of 42.74 (12.46) years. The primary diagnosis was schizophrenia and other psychotic disorders (74.5%). Baseline characteristics did not differ between groups. After the intervention, significant time × group interactions were observed for leg press 1RM ($p = 0.006$, $\eta^2p = 0.175$) and power output ($p = 0.017$, $\eta^2p = 0.138$), knee extension 1RM ($p = 0.012$, $\eta^2p = 0.149$) and power output ($p < .001$, $\eta^2p = 0.246$), and chest press 1RM ($p = 0.020$, $\eta^2p = 0.144$) and power output ($p = 0.003$, $\eta^2p = 0.221$). No significant time × group interaction was observed for 1RM ($p>0.05$) in the seated row exercise, whereas the interaction was significant for power output ($p = 0.017$, $\eta^2p = 0.133$).

Conclusion:

A 6-week multicomponent exercise program appears effective for improving muscle function in patients with SMI.

Poster - IDa094

Impact of a short-term exercise program on clinical symptomatology in patients with severe mental illness: A preliminary randomized controlled trial.

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BACKGROUND:

Clinical symptomatology is associated with a reduced quality of life in patients with severe mental illness (SMI). Physical exercise appears effective to improve clinical symptomatology; however, short-term beneficial effects remain unclear. The aim of the present study was to evaluate the impact of a 6-week multicomponent physical exercise intervention on clinical symptoms in middle-aged adults with SMI.

METHODS:

Patients with SMI from the Mental Health Rehabilitation Centre in Pamplona (Navarre, Spain) were randomly assigned to either the intervention Group (IG) or the control Group (CG). The IG performed a 6-week (twice a week) supervised multicomponent exercise program, including strength and balance exercises and a high-intensity interval training (HIIT). The CG received usual medical care. Changes in clinical symptomatology were assessed by the PANSS total score and positive, negative and general subscales, and the Beck Depression Inventory (BDI-II) scale.

RESULTS:

A total of 40 patients (IG=20 and CG=20) were included and completed both pre- and post-intervention assessments (mean age, 44.45±14.41 years; 62.5% male). After the intervention, the IG showed a significant reduction in the PANSS total score (mean change (Δ) of -9.05 points; p=0.003), PANSS negative (Δ -2.40 points; p= 0.011), PANSS general (Δ -4.70 points; p=0.027) and the BDI-II scores (Δ -7.20 points; p=0.006). No significant changes were observed in the CG (p>0.05). In the between-group analysis, the IG showed significant improvements in the PANSS total score (mean difference (MD) 7.9; 95% confidence interval [CI]: 0.73, 15.07; p= 0.032) and PANSS negative (MD 2.35; 95% CI: 0.22, 4.48; p=0.032) score compared to the CG. No significant between-group differences were observed in the remaining outcomes (p>0.05).

CONCLUSION:

A 6-week multicomponent physical exercise program seems to provide beneficial effects in overall clinical symptomatology and negative symptoms in adults with SMI.

Poster - IDa095

Mixed-Methods Process Evaluation of Take A Walk With Your Brain, a Cognitively Enriched Walking Program for Community-Dwelling Older Adults.

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Because of the promising effects of combined cognitive and physical activity (PA) on cognitive functioning in lab-based settings, we co-designed a real-life cognitively enriched walking program, Take a Walk With Your Brain, together with older adults (over 65 years old) and walking coaches. This cognitively enriched walking program consisted of twice-weekly supervised group-based sessions during which walking and cognitive tasks were simultaneously performed, complemented by one unsupervised weekly session. To reflect real-life implementation, the program was delivered in a community-based setting by walking coaches rather than researchers, enabling insights into its practical delivery.

Tested in a 6-month three-arm randomized controlled trial in older adults (n= 148; over 65 years old), this cognitively enriched walking program did not show significant cognitive benefits compared to either the non-enriched walking program or the control group. We performed a mixed-methods process evaluation to explore the program's implementation. Fidelity, dose delivered, dose received, reach, recruitment and context were evaluated following the framework of Saunders et al. (2005). Data were collected through questionnaires during and after the intervention and through conducting focus groups with participants (n=85) and coaches (n=8) supervising the intervention. The findings clearly demonstrate that the program was enjoyable and feasible for participants, with strong adherence to group sessions and the social aspect as a motivation for continued participation. However, both participants and coaches experienced several challenges during the implementation, including difficulties in maintaining a moderate level of PA intensity, providing adequate cognitive challenge for all participants, low adherence to unsupervised cognitively enriched walking sessions, and the study suffered selection bias. Additionally, coaches could have benefited from more intensive training and greater inter-coach support during the intervention period. Future combined cognitive and PA interventions should address these challenges to enhance effectiveness.

Poster - IDa097

Associations of physical activity and sedentary time from childhood to adolescence with cognition in adolescence: The PANIC study

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Purpose

Investigate the associations of cumulative exposure to physical activity (PA), sedentary time and screen time from childhood to adolescence over an 8-year follow-up with cognition in adolescence.

Methods

Altogether, 260 adolescents (136 boys) who were 15–17 years at 8-year follow-up were analysed. PA and sedentary time were assessed using an Actiheart®-device, and different types of PA, non-screen-based sedentary time and screen time were assessed by a questionnaire at baseline, 2-year and 8-year examinations. Psychomotor function, attention, working memory, paired-associate learning and overall cognition were assessed using CogState tests at 8-year examinations.

Results

Self-reported cumulative unsupervised PA from childhood to adolescence was inversely associated with accuracy in working memory task (standardized regression coefficient (β)=-0.127, 95% confidence interval (CI) -0.247 to -0.008) in adolescence. Self-reported non-screen-based sedentary time was inversely associated with reaction time (β=-0.176, 95% CI -0.299 to -0.053) and accuracy (β=-0.149, 95% CI -0.274 to -0.024) in working memory tasks. Self-reported screen time was inversely associated with reaction time (β=-0.194, 95% CI -0.316 to -0.071) and (β=-0.233, 95% CI -0.355 to -0.112) in both working memory tasks and directly associated with overall cognition (β=0.187, 95% CI 0.070-0.305). Device-assessed cumulative PA or sedentary time was not associated with cognition.

Conclusion

Accumulating less unsupervised PA and more screen time from childhood to adolescence was associated with better cognition in adolescence. Screen time can include activities that may improve cognition, such as reading, writing, doing homework and playing video games. In contrast, unsupervised PA might displace certain activities that enhance cognition, such as reading and doing homework. Notably, device-assessed cumulative PA or sedentary time was not associated with cognition, suggesting that the associations of PA and sedentary time from childhood to adolescence with cognition in adolescence depend on the context and assessment method of PA and sedentary time.

Poster - IDa098

Muscular Strength and Executive Functions Across Youth: Age-Dependent Associations

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Executive functions (EF) are higher-order cognitive processes central to goal-directed behavior. Maturation of EF extends across childhood and adolescence, resulting in a longer period of heightened developmental sensitivity [1]. Because muscular strength (MS) and EF emerge in early childhood and remain responsive across the lifespan, MS may be a promising target to support EF in youth. We aimed to investigate the association of MS and EF in children and adolescents and whether this association is moderated by age.

348 healthy children and adolescents (5-21 years) from the Healthy Brain Network (HBN) cohort [2] completed a Flanker (inhibition/attention; NIH), a Card Sorting (cognitive flexibility; NIH) and a Digit Span task (working memory updating; WISC-V). Additionally, they performed the FitnessGram curl-up, push-up and trunk lift tests. Scores of individual strength tests were combined to a composite score.

Structural equation modelling revealed that greater MS was significantly associated with better working memory updating ($\beta = .223$, $p = .006$), cognitive flexibility ($\beta = .193$, $p = .001$) and inhibition ($\beta = .219$, $p < .001$) across all participants. Age moderated the association of MS with both inhibitory control ($\beta = -.184$, $p < .001$) and cognitive flexibility ($\beta = -.097$, $p = .048$), so that younger participants showed a higher strength of the association.

Our findings indicate that higher MS is associated with better EF in youth. However, the moderating role of age suggests that with regard to inhibitory control and cognitive flexibility, younger children might benefit more from higher MS than their older peers.

References

[1] Ferguson, H., Brunsdon, V., & Bradford, E.(2021). The developmental trajectories of executive function from adolescence to old age. Scientific Reports, 11(1), 1382.

[2] Alexander, L. M., Escalera, J., Ai, L., et al.(2017). An open resource for transdiagnostic research in pediatric mental health and learning disorders. Scientific Data, 4(1), 170181.

Poster - IDa099

Effects of Group-Based and Individualized Exercise on Global Cognition and Executive Function in Older Adults: A Systematic Review

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Background and aims

Physical activity has been well-evidenced to support cognitive function in older adults. In general, exercise promotes neuroplasticity, aerobic exercise has been found to improve hippocampal volume and memory, and resistance training has separately demonstrated benefits in executive function and attention. Beyond these benefits, the social context in which exercise is performed may influence cognitive outcomes. Few studies compare group-based exercise with individualized formats. It remains unclear whether a social component provides cognitive benefits beyond those achieved through individually performed exercise.

Methods

This systematic review aims to evaluate randomized controlled trials comparing group-based and individualized exercise programs in adults aged 55 years and older with a focus on cognitive outcomes. Studies were examined that reported at least one cognitive outcome assessing global cognition or executive function using validated neuropsychological tests. After data were extracted, risk of bias was assessed via the Cochrane Risk-of-Bias tool.

Results

The search identified 2629 records. After removing duplicates, forty-nine full texts were reviewed, and four articles met eligibility criteria for inclusion. Three of the four trials showed improvement in cognitive domains in group-based intervention. The other trial demonstrated preservation of cognitive status compared to a decline in the control group. All trails raised concerns for reporting bias amongst other concerns.

Conclusion

Results show modest benefits for group-based exercise formats, with the caveat that social and structured interaction may enhance these effects. Future studies should focus on well-powered randomized controlled trials that directly compare identical exercise interventions delivered in group and individualized formats with cognitive outcomes as primary endpoints.

Poster - IDa101

Chronic exercise induces a pathway-dependent electrophysiological signature in the mouse hippocampus[

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Chronic physical exercise is known to benefit hippocampal activity, but the functional correlates are unclear. We explored if chronic treadmill running leaves time-persistent imprints on hippocampal network activity through electrophysiological techniques and spatial transcriptomics. Field potentials (FPs) were recorded across hippocampus layers in anesthetized adult mice 24 hours after the final training session of a chronic physical exercise protocol. Activity patterns of FP generators obtained through spatial discrimination were analyzed across animals with machine learning procedures to determine whether prior exercise could be identified from electrophysiological fingerprints alone.

We found this to be the case for the lateral perforant path (81.08% accuracy, p=0.013), whereas Schaffer collateral and lacunosum-moleculare generators showed high-magnitude (but heterogeneous) shifts that didn't reach group-level significance. Exercise shifted the LPP activity signature toward greater complexity and higher-frequency oscillations. The main driver of the classification in PLL for our algorithm was signal complexity. Parallel spatial transcriptomics revealed convergent gene expression programs consistent with synaptic plasticity in CA1 and structural maturation in the dentate gyrus, a region previously shown to exhibit exercise-induced neurogenesis. We propose that sustained exercise leads to durable pathway-specific alterations in hippocampal activity as a result of activations of cellular programs supporting spatially localized plasticity mechanisms.

Poster - IDa102

Sex Moderates the Association Between Brain Age Gap and Gait Speed in Older Adults with Mild Cognitive Impairment

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Background: Gait speed is a clinically relevant marker of both physical and cognitive impairment in aging. Declines in gait speed are also associated with structural brain changes measured using magnetic resonance imaging (MRI). In parallel, machine learning approaches can estimate brain-predicted age from structural MRI scans. The difference between predicted and chronological age, known as brain age gap (BAG), serves as a marker of accelerated brain aging, where larger gaps indicate greater deviation from normal aging. We examined the moderating effect of sex on the relationship between BAG and gait speed in individuals with mild cognitive impairment (MCI).

Methods: Using baseline data from two randomized controlled trials, this cross-sectional analysis computed brain-predicted age from T1-weighted MRI scans with the brainageR model in 158 community-dwelling adults aged 55-85 years with MCI. BAG was then computed as the difference between brain-predicted age and chronological age. Usual gait speed was measured using the 4-meter walk test. Linear regression was used to examine the association between gait speed and BAG, with an interaction term between gait speed and sex. Models were adjusted for trial cohort, body mass index, and Montreal Cognitive Assessment (MoCA) scores.

Results: Our sample included 98 females (mean age = 73.1 years, SD = 5.39) and 60 males (mean age = 73.5 years, SD = 5.23). A significant interaction was observed between gait speed and sex (β = -13.43, SE = 4.65, p = .004), whereby slower gait speed was associated with a larger BAG in males (β = -0.79, 95% CI [-17.91, -3.67] but not in females (β = 2.64, 95% CI [-3.36, 8.64]).

Conclusion: These findings suggest that slower gait speed was linked to a larger BAG in males but not in females. Thus, interventions targeting gait speed may be particularly relevant for mitigating accelerated brain aging in older males.

Poster - IDa103

Exercise-induced metaplastic windows in learning and memory

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Acute exercise enhances learning and memory, yet the temporal mechanisms linking a single exercise bout to subsequent plasticity remain poorly defined. We propose that exercise initiates two temporally distinct metaplastic windows: an immediate period of heightened sensitivity to brain stimulation, followed by a delayed period favouring long-term memory-trace formation.

Acute exercise produced a transient, intensity-dependent modulation of hippocampal plasticity-related signalling, characterized by an inverted-U dose–response relationship with maximal effects following moderate-intensity exercise. Immediately after exercise, phosphorylation of AMPA receptor subunits increased ($F_{4,33}$=14.2, p<0.0001), alongside activation of protein kinase A (PKA; $F_{4,28}$=19.5, p<0.0001) and AKT ($F_{4,34}$=10.9, p<0.0001). Exercise also produced a sex-dependent suppression of glycogen synthase kinase-3β activity in females ($F_{4,15}$=13.6, p<0.0001). These effects returned toward baseline within approximately one hour, defining a short-lived period during which synapses may be especially responsive to stimulation capable of inducing persistent potentiation. Our ex vivo studies further identified PKA and calcium-permeable AMPA receptors as critical mediators of exercise-relevant late-phase long-term potentiation mechanisms.

However, we identified a second, delayed phase that may instead represent increased sensitivity to behavioural interventions and long-term memory-trace formation. CREB is a critical regulator of neuronal excitability, memory allocation, and engram formation. Experimentally increasing CREB biases which neurons are recruited into an engram and influences the size and composition of the resulting neuronal ensemble. CREB expression demonstrated a significant temporal response to exercise (one-way ANOVA: $F_{2,23}$=6.039, p=0.0078). A priori comparisons indicated no significant increase immediately after exercise (mean=69±33, p=0.09), but a significant increase one hour later (mean=116±33, p=0.004).

Together, these findings support a temporally ordered model in which exercise first primes synapses for stimulation-induced potentiation and subsequently establishes a CREB-associated state favouring engram allocation and memory consolidation.

Poster - IDa104

Brain capital and lifestyle habits in Argentina: disparities by educational level

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Lifestyle habits and driver factors—perceived mental health, social support, access to learning—are central, modifiable components of brain capital. This study aimed to compare these indicators between individuals with fewer than 12 years of education and those with more than 12 years of education, and to estimate their associations by age and sex using logistic regression. Quantitative, descriptive study based on a structured telephone survey of 1,052 individuals aged 18–70 residing in seven Argentine cities, selected through systematic random sampling. For the comparison, 826 cases were analyzed: fewer than 12 years of education (n=347) and more than 12 years of education (n=479). Mean age was 40.9 years, and 49.2% were women. Associations were estimated using logistic regression adjusted for age and sex. Compared with individuals with fewer than 12 years of education, those with more than 12 years of education showed higher rates of recommended physical activity (29.0% vs. 16.7%; adjusted OR=2.07; 95% CI 1.46–2.94), higher daily fruit and vegetable consumption (38.4% vs. 14.7%; OR=3.51; 95% CI 2.46–5.00), better perceived mental health (59.5% vs. 45.2%; OR=1.80; 95% CI 1.35–2.38), greater full social support (74.1% vs. 61.4%; OR=1.81; 95% CI 1.34–2.45), and more frequent access to continuous learning (64.9% vs. 34.6%; OR=3.44; 95% CI 2.57–4.61), all with $p<0.001$ after adjusting for age and sex. Sufficient sleep (≥7 hours) was the only exception: the difference was small (56.6% vs. 53.0%) and did not reach statistical significance (OR=1.16; 95% CI 0.87–1.53; p=0.31). More than 12 years of education is independently associated with better physical activity and dietary habits, as well as with key driver factors of brain capital, even after adjusting for age and sex. Sleep showed no statistically significant association, suggesting the need to explore other determining factors. Strengthening education appears to be an effective strategy for several pillars of brain capital.

Poster - IDa105

24-hour movement behaviors and MRI markers of brain health in the general aging population: Results from the Rotterdam Study

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Physical activity (PA) is considered a promising strategy for promoting brain health. However, PA occurs within a fixed 24-hour time frame, meaning that increasing PA necessarily displaces time from sedentary behavior (SB) or sleep, both also influencing brain outcomes.

This cross-sectional analysis included 1195 participants from the Rotterdam Study (mean age 69.9, 51% female). Movement behaviors (moderate-vigorous PA [MVPA], light PA [LPA], SB and sleep) were measured with wrist-worn accelerometers analyzed using compositional data analysis. Multiple linear regressions and isotemporal substitutions tested the association between movement behaviors and brain structure, white matter microstructure and cerebrovascular health markers on MRI. First model was adjusted for age, sex, education and intracranial volume. Second model was additionally adjusted for depressive symptoms, diabetes, hypertension, coronary heart disease, alcohol consumption, smoking and body mass index.

Higher MVPA composition was associated with greater white matter (model 1: β=29.28, Pfdr<0.001; model 2: β=27.11, Pfdr=0.002) and total brain volumes (β=27.61, Pfdr<0.001; model 2: β=28.21, Pfdr<0.001), higher fractional anisotropy (models 1 and 2: β=0.008, Pfdr=0.02), lower mean diffusivity (models 1 and 2: β=-0.017, Pfdr=0.001), lower white matter hyperintensity volume (model 1: β=-0.19, Pfdr=0.03), lower likelihood of cortical infarcts (models 1 and 2: odds ratio [OR]=0.04, Pfdr=0.02) and microbleeds (model 1: OR=0.22, Pfdr=0.02; model 2: OR=0.24, Pfdr=0.02), and greater cerebral blood flow (model 1: β=42.27, Pfdr=0.03; model 2: β=40.83, Pfdr=0.04). No significant associations were found for gray matter, hippocampus, lacunar infarcts, or brain perfusion (all Pfdr>0.09). Isotemporal substitutions showed greater benefit when reallocating time from LPA to MVPA, except for cerebrovascular markers, which benefited more from SB reallocations.

Higher accelerometer-measured MVPA, compared to the rest of behaviors, was associated with better brain health, especially with white matter and cerebrovascular outcomes. Further longitudinal studies and interventional designs are needed to establish whether increasing MVPA causally contributes to better brain health.

Poster - IDa106

The 24-Hour Activity Cycle, Allostatic Load, and Early Neurodegeneration in Midlife

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Background: Healthy lifestyle activity behaviours are associated with better brain health; however, most evidence considers behaviours independently despite their interdependence within the 24-hour day. Allostatic load, an index of cumulative physiological stress, may represent a biological pathway linking unfavourable movement profiles to early neurodegenerative changes in midlife.
Objective: We will examine associations between the 24-hour activity cycle and MRI-derived markers of early neurodegeneration and myelin, and whether allostatic load mediates or moderates these associations.
Methods: We will conduct a cross-sectional study of 160 adults aged 40-59 years recruited across a cardiometabolic risk continuum in the Greater Montréal area. Approximately two-thirds will have at least one cardiometabolic condition. Recruitment will aim to reflect Montréal's ethnically diverse population including 40% Black, Arab, Latin American, and 60% non-Hispanic White participants. Lifestyle activity behaviours, including sleep, sedentary behaviour, light physical activity, and moderate-to-vigorous physical activity, will be derived from 7-14 days of wrist-worn ActiGraph LEAP 2.0 accelerometry and modelled using compositional data analysis. Multimodal 3T MRI will be used to derive machine learning indices of early neurodegeneration signatures, myelin water fraction, white matter hyperintensity burden, and functional connectivity. Allostatic load will be measured across cardiovascular, metabolic, and inflammatory systems using physiological monitoring. Covariate-adjusted linear models will test associations between each lifestyle activity behaviour and brain outcome. Mediation and moderation models will examine the role of allostatic load, with missing data handled using multiple imputation and the false-discovery rate controlled using the Benjamini–Hochberg procedure.
Expected Results: More favourable 24-hour activity profiles are expected to be associated with lower expression of early neurodegenerative signatures and greater myelin content. Higher allostatic load is expected to attenuate these associations.
Significance: This study will clarify whether cumulative physiological stress explain heterogeneity in the brain health benefits of lifestyle activity behaviours during midlife.

Poster - IDa107

Associations of Physical Activity and Sleep Quality with Preclinical Neurodegeneration in Older Adults at Risk for Alzheimer's Disease

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Background: Low physical activity (PA) and poor sleep contribute to Alzheimer's disease (AD)-related neurodegeneration; however, their independent effects remain underexplored. We examined PA and sleep quality in preclinical AD and assessed the mediating role of white matter hyperintensities (WMH).

Methods: We conducted an exploratory cross-sectional analysis of the PREVENT-AD cohort. PA and sleep were derived from Lifetime Total Physical Activity Questionnaire and Pittsburgh Sleep Quality Index, respectively. T1-weighted MRI scans were processed with machine learning algorithms (SPARE-AD, SPARE-BA, SurrealGAN) and FreeSurfer. Robust linear models tested independent PA or sleep associations with these indices, adjusting for age, educational years, body mass index, sex, APOE e4, and intracranial volume. WMH, segmented by random forest classifier, was tested as mediator in post-hoc models.

Results: We included 137 participants (mean [SD] age 65.69 [5.18] years; 74.5% female). Higher PA was associated with lower cortical volume in lateral orbitofrontal (Unstandardized B = -0.006, 95% CI [-0.011, 0.000], p=0.047), attenuated after sleep adjustment, and higher cortical volume in pericalcarine (0.007 [0.002, 0.012], p=0.007) and transverse temporal (0.002 [0.000, 0.004], p=0.015), independent of sleep quality. Worse sleep quality was associated with higher atrophy measured with SurrealGAN (R-index 1, 0.015 [0.002, 0.027], p=0.025), independent of PA, and nominally significant with lower cortical volume in rostral anterior cingulate cortex (-0.032 [-0.064, 0.000], p=0.051). WMH did not mediate any of these associations. In a secondary analysis expanding the sample beyond the MRI timepoint (n=252; mean 1.17 [1.84] years between questionnaire and MRI), the PA-lateral orbitofrontal remained the sole significant association.

Conclusions: PA may have a complex, nominal region specific relationship with neurodegeneration. Poor sleep was modestly associated with greater neurodegeneration in data-driven atrophy patterns and regional grey matter. In the secondary analysis, the PA-lateral orbitofrontal association was the sole finding to persist, suggesting this regional effect may be the most robust.

Poster - IDa108

Functional connectivity of anterior insular subdivisions following the IMOVE study: an arts-based intervention in people with cognitive impairment

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Background: Alzheimer's disease (AD) affects emotional and social function. The insular cortex (part of the salience network) integrates internal states with environmental cues and is implicated in immediate memory performance. The IMOVE trial (NCT03333837) found that 12 weeks of social, arts-based activities in people with cognitive impairment led to improvements in immediate memory. Therefore, we investigated whether functional connectivity within insular subnetworks related to immediate memory performance.

Methods: The IMOVE trial was a randomized, single-blind trial designed to test the effects of adding twice-weekly movement and/or social engagement classes in people with MCI or early-stage dementia and their caregivers (n=101). Participants were split into one of four study conditions for 12 weeks: movement alone, movement group, social group, and usual care control group. fMRI images and Repeatable Battery for the Assessment of Neuropsychological Status were collected before and after intervention. A voxel-wise seed-based functional connectivity analysis was used to measure functional connectivity of the whole-brain at resting state using 8mm spherical region of interest (left ventral anterior insula, LvAI; right dorsal anterior insula, RdAI). Each voxel in the ROI was correlated to every other voxel in the brain. The resulting maps for each seed voxel were averaged, resulting in the average correlation between the seed voxels and the whole brain. A Gaussian spatial smoothing kernel (8mm3 FWHM) was applied. Statistical maps were thresholded at $p < 0.005$ (uncorrected voxel-wise) and $p < 0.05$ FWE-corrected at the cluster level.

Results: In PWCI whose immediate memory performance improved, LvAI exhibited negative connectivity with left superior parietal lobule and right inferior parietal lobule, bilateral cerebellar crus I/II, and PCC, while RdAI is negatively correlated with right cerebellum crus I/II. Improvement in immediate memory in PWCI was associated with decreased anterior insula connectivity with default mode and dorsal attention networks, suggesting increased network differentiation

Poster - IDa109

Active Lives, Agile Minds: Co-production and Pilot Evaluation of the Movement Inspired by Martial Arts Programme for Older Adults

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This project aimed to promote physical activity and cognitive function among older adults from diverse ethnic communities. Guided by the Double Diamond co-production framework, the project had two objectives: (1) to develop the multicomponent Movement Inspired by Martial Arts Programme (MIMA); (2) to evaluate and refine the programme with women from ethnically diverse communities.

Methods
In Phase 1, development of MIMA involved system mapping with older adults, healthcare professionals, and third-sector organisations to identify key factors influencing physical activity. Through two co-design workshops involving stakeholders and older adults, and three taster sessions, the MIMA exercise session format and delivery model were developed.
In Phase 2, MIMA pilot programme was delivered in a church hall in collaboration with Women Connect First charity, with participants joining on a rolling basis. A mixed-methods evaluation was conducted using focus groups, instructor reflective logs, questionnaires, and field-based assessments to evaluate acceptability and explore potential impacts on physical and cognitive function.

Findings
Seventeen women participated in the pilot (97% non-British; mean age = 67 years). Participants reported moderate exercise intensity during sessions. Qualitative findings indicated strong engagement and positive experiences. Participants reported benefits related to social interaction, flexibility, and balance.
Mobility was also assessed using Short Physical Performance Battery (SPPB). Changes in SPPB scores were not statistically significant but they showed the expected direction. Mean SPPB scores increased over the three-month intervention period, with 78% of participants showing improvement in the 4-m walking test and 56% in the chair-rise test.

Conclusion
Co-production and stakeholder engagement enhanced recruitment, acceptability, and perceived feasibility of the programme. Future work will focus on scaling up MIMA, evaluating its effectiveness, and adapting it for people living with dementia and their carers while maintaining accessibility in home and care settings. Ambassadors and community partnerships will support wider implementation among disadvantaged groups.

Poster - IDa110

The effects of exercise training on spatial entropy in the brain in obese older adults

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Background: We tested effects of 20 weeks of aerobic exercise on resting-state fMRI (rsfMRI) scans in 95 sedentary older adults with obesity and obesity-related heart failure with preserved ejection fraction (HFpEF) using spatial entropy, a new measure of spatial disorder of brain network communities.

Methods: rsfMRI scans were collected before and after intervention in two trials of exercise training for 20 weeks in older adults with similar metabolic characteristics. In both studies, all participants received supervised treadmill walking (aerobic training: AT). Both studies included caloric restriction (CR) arms and one study included resistance training (RT) added to AT. The INFINITE study randomized older adults with obesity to one of three study arms: AT only, AT+lowCR, AT+HighCR. The SECRET-II study randomized older adults with HFpEF to either AT+CR or AT+CR+RT. We evaluated associations between spatial entropy at baseline and metabolic variables of interest (self-reported type 2 diabetes, cardiorespiratory fitness, blood pressure). We then tested whether entropy changed after exercise, adjusting for study, age, and sex. Statistical significance was determined by a p-value<0.005 combined with correction for multiple comparisons using cluster size.

Results: At baseline, the presence of self-reported type 2 diabetes was associated with increased entropy in superior frontal gyrus and somatomotor cortex. Better cardiorespiratory fitness was associated with lower entropy in somatomotor cortex, temporoparietal junction, and
parietal cortex. There were no statistically significant associations between blood pressure and entropy. After 20 weeks of aerobic exercise, entropy was reduced in prefrontal and somatomotor cortices.

Conclusions: Type 2 diabetes status and cardiorespiratory fitness were associated with spatial disorganization of brain networks at baseline in older adults with obesity and obesity-related HFpEF. Twenty weeks of supervised exercise training resulted in decreased entropy in regions associated with cognition and movement.

Poster - IDa111

Effects of acute physical activity on neural correlates of working memory in children with and without ADHD: insights from the Break4Brain project

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Introduction: Acute physical activity (PA) may enhance working memory (WM) in children with and without Attention Deficit/Hyperactivity Disorder (ADHD). However, which PA characteristics yield the greatest cognitive benefits remains unclear. This study examined behavioural and electroencephalographic (EEG) responses during WM across different experimental conditions varying in PA and cognitive demands.

Methods: This crossover within-subject study included 52 children aged 10–12 (25 ADHD, 27 non-ADHD). Participants completed four sessions separated by seven-day washout periods, comprising a baseline assessment and three 10-minute experimental conditions: (A) cognitively engaging control without PA, (B) PA with cognitive engagement, and (C) PA without cognitive engagement. At baseline and after each condition, participants performed the n-back task (1-back and 2-back) while EEG activity was recorded. Reaction time (RT), accuracy, and sensitivity (d′) were analyzed using separate 2×4×2 mixed-design ANOVAs. EEG outcomes included N2 and P3.

Results: Condition affected RT ($p = .007$, $\eta^2 = .090$), accuracy ($p < .001$, $\eta^2 = .733$), and d′ ($p < .001$, $\eta^2 = .727$). RTs were faster in condition B than at baseline ($p = .016$). Accuracy was higher at baseline and in condition B than in conditions A and C ($ps < .001$), baseline and B did not differ ($p = .529$). Children without ADHD showed higher accuracy ($p = .016$). Sensitivity was higher at baseline and in B than in A and C, and higher in A than C. Condition interacted with n-back load for accuracy and d′ ($ps < .001$), but neither condition effects nor these interactions differed by group. EEG analyses are ongoing.

Conclusions: PA with cognitive engagement resulted in faster RTs than baseline, accuracy comparable to baseline, and higher d′ than conditions A and C. Effects were similar between groups, suggesting that cognitive engagement may contribute to the acute effects of PA on WM.

Poster - IDa112

Associations of quadriceps function with brain structure in persons with COPD: an exploratory cross-sectional analysis

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Background: Mild cognitive impairment (MCI) and muscle dysfunction are highly prevalent in individuals with chronic obstructive pulmonary disease (COPD). MCI is linked to structural brain changes, including reduced grey matter volume (GMV) and ventricular enlargement. Muscle function is associated with brain structure in healthy older adults. Yet, this relationship is unexplored in individuals with COPD.

Aim: To examine associations of hippocampal and dorsolateral prefrontal cortex (DLPFC) GMV and lateral ventricle volumes with quadriceps function in individuals with COPD.

Methods: Exploratory cross-sectional study including individuals with stable COPD who underwent 3T MRI. Bilateral hippocampal and DLPFC GMV and lateral ventricle volumes were segmented using FreeSurfer and normalized to estimated total intracranial volume. Quadriceps function was assessed using measures of quadriceps strength (one-repetition maximum (1-RM)), power (five-times sit-to-stand (5STS)), and endurance (total work: repetitions until task failure at 45% 1-RM), with higher values indicating better quadriceps function. Partial correlation analyses were performed, correcting for age and educational level.

Results: Twenty-two individuals with COPD were included (68±6 years; 64% male; disease severity: 90% moderate-to-severe airflow obstruction; BMI: 28±5 kg/m²; education: 12±3 years). Bilateral hippocampal GMV was positively associated with 1-RM ($r=0.496$; $p=0.026$), and a moderate, non-significant association was found with 5STS ($r=0.407$; $p=0.075$). Bilateral DLPFC GMV was positively associated with 1-RM ($r=0.695$; $p<0.001$), and a moderate, non-significant association was found with 5STS ($r=0.405$; $p=0.076$). Total lateral ventricle volume showed moderate, non-significant associations with 5STS ($r=-0.314$; $p=0.178$) and total work ($r=-0.367$; $p=0.112$). Remaining associations were weak ($r<0.20$).

Conclusion: These exploratory data are the first to suggest an association between muscle function and brain structure in individuals with COPD, consistent with findings in healthy older adults. Larger studies should confirm these findings and explore the potential of exercise training to improve brain structure and cognitive function in individuals with COPD.

Poster - IDa113

Moderate-Vigorous Physical Activity and Cognition in Older Adult Participants from Lifestyle Trials: Baseline De Novo Analyses from The InLife Data Harmonization Study

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Background: Lifestyle health behaviors, including physical activity (PA), may protect against cognitive decline; however, consistent causal evidence is lacking. The InLife (Individualized Lifestyle Change for Every Aging Brain) Study aims to harmonize participant-level data from 13 U.S. randomized controlled trials (RCTs) for de novo analyses. This approach can enhance statistical power, address effect heterogeneity, and delineate cognitive trajectories in response to behavior change. Here, we present preliminary analyses of harmonized physical activity and cognitive data in an InLife subsample.

Methods: In InLife, demographic and health history data were harmonized through adjudication and unit standardization with a panel of experts in iterative meetings. Self-reported PA data are extracted from validated instruments including the Community Health Activities Model Program for Seniors (CHAMPS). CHAMPS data were verified and re-calculated to ensure consistent scoring procedures across studies. Episodic memory scores inferred and harmonized based on at least 6 neurocognitive tests across the trials were harmonized through a stepwise confirmatory factor analysis framework.

Results: To date, CHAMPS moderate to vigorous PA (MVPA) for 5 lifestyle RCTs (U.S. POINTER, LIFE, Experience Corps, BAILA, and MindMoves) has been harmonized (baseline median MVPA = 105 min/week, n = 3,808, mean age = 69.3 yrs, 74% female). Preliminary models of baseline only data show that individuals reporting at least 30 min/week of MVPA have higher mean episodic memory as compared to those who report less than 30 min/week of MVPA, a small, but statistically significant difference (Effect Size=0.07, 95% CI: 0.001, 0.15, p=0.045) after adjusting for age, sex, years of education and a fixed effect for RCT.

Conclusion: InLife provides an ongoing framework for PA and cognitive assessment harmonization to maximize existing data from lifestyle RCTs. Continued data analysis is ongoing. Future directions will include harmonization efforts, including additional lifestyle RCTs, other cognitive domains, and PA actigraphy assessment.

Poster - IDa115

Associations Between Cerebral Oxygenation, ECG QT dispersion, and Cognition in Individuals with Coronary Heart Disease: A Cross-Sectional Study

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Background: Autonomic function has been recognized as an important contributor to cognitive performance aging, particularly among individuals with coronary heart disease (CHD). One marker associated with autonomic regulation and cardiovascular health is the corrected QT dispersion (QTcD), an electrocardiographic (ECG) measure of ventricular repolarization. Elevated QTcD has also been associated with cognitive impairment, suggesting a potential connection between cardiac regulation and brain function. However, the mechanisms underlying this relationship remain poorly understood. Therefore, this study examined the associations between QTcD, cognitive performance and cerebral oxygenation in individuals with CHD.

Methods: Thirty-eight individuals (69.8 ± 6.9 years; 11 females) with CHD completed a resting ECG and the Trail Making Test (Trail-A and Trail-B). During the cognitive task, oxyhemoglobin changes in the ventrolateral and dorsolateral prefrontal cortex (PFC) was measured with functional near-infrared spectroscopy (fNIRS).

Results: After controlling for age, sex, and education, QTcD was not associated with Trail-A or Trail-B performance (respectively, B = 0.034, β = 0.139, p = .425, B = -0.008, β = -0.013, p = .938). QTcD was also not significantly associated with dorsolateral PFC during cognitive task. No significant associations were found between ventrolateral PFC and Trail-A. In contrast, QTcD was significantly associated with ventrolateral PFC during Trail-B (B = 0.020, β = 0.540, t = 2.975, p = .007). Cerebral oxygenation in either PFC region was not associated with cognitive performance.

Conclusion: Although QTcD was unrelated to executive performance, its association with greater ventrolateral prefrontal cortex oxygenation during the more challenging Trail-B cognitive task suggests that autonomic dysfunction may influence the neural processes supporting executive function even when differences in behavioral performance are nonapparent. Increased cortical activation in the absence of performance differences may reflect compensatory neural recruitment required to maintain cognitive function.

Poster - IDa116

Beyond Symptoms: Sex-Specific Physical, Clinical, and Cardiometabolic Health in Treatment-Resistant Major Depression

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Introduction: Treatment-resistant major depression (RMD) is associated with a high symptom burden, physical comorbidities, and premature mortality, yet its multidimensional physical and cardiometabolic profile remains poorly characterised. This cross-sectional study aimed to comprehensively characterise the anthropometric, haemodynamic, biochemical, psychiatric, functional, and cardiovascular profile of adults with RMD and examine sex-specific differences across these domains.

Methods: Fifty adults with RMD (21 men and 29 women; 54.6 ± 12.2 years) underwent comprehensive baseline assessments including anthropometry, haemodynamic, blood biomarkers, psychiatric symptom severity, health-related quality of life, physical activity, sedentary behaviour, cardiorespiratory fitness, and cardiovascular risk. Sex-specific differences were explored using between-group comparisons.

Results: Beyond severe depressive symptoms, participants exhibited a multidimensional health burden characterised by overweight/obesity (BMI 29.6 ± 6.0 $kg \cdot m^{-2}$), low physical activity levels, prolonged sedentary behaviour (5 h/day), and markedly reduced cardiorespiratory fitness, with peak oxygen uptake values corresponding to low age- and sex-specific percentiles (men: 22.0 ± 6.9; women: 17.2 ± 4.7 $mL \cdot kg^{-1} \cdot min^{-1}$). Psychiatric assessment revealed moderate-to-severe depressive symptomatology (MADRS = 35.0 [IQR 26.0–38.0]), marked functional impairment (CGI-S = 5.0 [IQR 4.0–5.0]), and poor health-related quality of life. Biochemical analyses suggested a low-grade pro-inflammatory and cardiometabolic risk profile, with atherogenic index and IL-6 values approaching the upper reference range, together with reduced IL-10 concentrations. A pronounced sexual dimorphism was observed across anthropometric, haemodynamic, biochemical, and functional domains, with men exhibiting a consistently less favourable cardiometabolic profile and higher estimated 10-year cardiovascular risk.

Conclusions: These findings demonstrate that RMD is characterised by a substantial physical, cardiometabolic, inflammatory, and functional burden extending beyond psychiatric symptoms, supporting the need for comprehensive and sex-informed clinical assessment and management.

Poster - IDa117

Acute effects of physical activity and cognitive engagement on current source density during inhibitory control in children with and without ADHD

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Background: Acute physical activity may affect inhibitory control; however, the effects of activities differing in physical activity and cognitive engagement on source-level neural responses in children with and without attention-deficit/hyperactivity disorder (ADHD) remain understudied. This study examined the effects of three conditions differing in physical activity and cognitive engagement on current source density during an inhibitory control task.

Methods: Forty-one children, 18 with ADHD (10.60 ± 1.04 years; 38.9% girls) and 23 without ADHD (11.00 ± 0.88 years; 39.1% girls), completed a baseline assessment and three conditions in a randomized crossover design. These comprised cognitively engaging sedentary control (CA), physical activity with alternating cognitive engagement (CB), and physical activity without cognitive engagement (CC). Current source density during the Flanker task was estimated using standardized low-resolution brain electromagnetic tomography (sLORETA).

Results: In children with ADHD, no significant source-level changes from baseline or differences among conditions were observed. In children without ADHD, current source density increased during incongruent trials after each condition relative to baseline. Following CA, increases were observed in right frontal-temporal regions at 195–225 ms; following CB, in the right postcentral gyrus at 230–245 ms; and following CC, in left medial cingulate regions, including the anterior cingulate cortex and cingulate gyrus, at 260–280 ms (all corrected $p < .05$). Direct comparisons among conditions were not significant. Between-group differences emerged only after CC, with higher frontal-cingulate current source density in children without ADHD during incongruent trials (corrected $p < .05$).

Conclusion: Our findings suggest that source-level responses during inhibitory control may vary by neurodevelopmental profile across acute conditions differing in physical activity and cognitive engagement. Direct comparisons did not support condition-specific effects or the superiority of any condition. The between-group difference after CC may indicate lower frontal-cingulate engagement in children with ADHD, although further research is needed.

Poster - IDa118

"I Became a Person Again, If That Makes Sense": A Qualitative Study of Perceived Benefits Following an Exercise Intervention in People with Treatment-Resistant Major Depression

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Introduction: Exercise is an established adjunctive treatment for major depressive disorder, yet little is known about how people with treatment-resistant major depression (RMD) experience its effects beyond changes captured by clinical scales. This study explored participants' perceived benefits following a supervised combined exercise intervention across physical, psychological, social, and behavioural domains.

Methods: Twenty-four adults (14 women; mean age 55.9 ± 12.2 years) diagnosed with RMD completed a 12-week, twice-weekly supervised combined exercise programme. After the intervention, participants underwent semi-structured qualitative interviews. Interviews were audio-recorded, transcribed verbatim, and analysed using reflexive thematic analysis.

Results: The thematic analysis revealed dynamic, multidimensional benefits across four interconnected domains: 1) physical: participants reported immediate sensations of relaxation and sustained improvements in muscular strength, endurance, and agility, facilitating reconnection with their bodies; 2) mental: the intervention broke persistent depressive cycles, resulting in immediate improvements in mood, a temporary pause in rumination, and sustained reductions in suicidal ideation and hopelessness; 3) social: the homogeneous, group-based setting provided a protected environment that mitigated isolation, fostered peer empathy, and facilitated social reconnection; and, 4) behavioural: participants described overcoming initial resistance to physical activity, developing sustainable exercise routines and healthier daily habits. Overall, exercise emerged as a catalyst for identity reconstruction, shifting participants from passivity to restored autonomy and self-efficacy.

Conclusions: These findings suggest that supervised combined exercise may facilitate recovery processes extending beyond symptom reduction, providing qualitative evidence for its value as a holistic adjunctive intervention in people with RMD.

Poster - IDa119

Walking Energy Expenditure as a Predictor of Cognitive Impairment Risk

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Background: The energetic cost of walking increases with age and predicts physical function decline, but its relationship with cognitive impairment is unclear. We investigated longitudinal associations between the energetic cost of walking and incident cognitive impairment in adults aged ≥65 years participating in the Baltimore Longitudinal Study of Aging (BLSA).

Methods: A total of 687 cognitively normal older adults (mean age 74.0±7.2 years; 52% women) underwent repeated walking energy expenditure (VO_2) assessments and adjudicated cognitive evaluations over 7.6±3.8 years. Linear mixed-effects models compared trajectories of walking energy cost between participants who later developed cognitive impairment and those who remained cognitively normal. Cox regression examined associations between baseline walking energy cost and incident cognitive impairment. Sensitivity analyses adjusted for usual walking speed and used multiple imputation for missing covariates.

Results: Ninety-one participants (13%) developed cognitive impairment. Participants who progressed exhibited a steeper increase in walking energy cost over time than non-progressors (B=0.13; p=.003). Higher baseline walking energy cost predicted cognitive impairment among adults aged ≥75 years (HR=1.10, 95% CI=1.00–1.20; p=0.039), but not among those aged 65–74 years (HR=0.91, 95% CI=0.81–1.01; p=0.089). Findings were unchanged after accounting for walking speed and missing covariate data.

Conclusion: Among cognitively normal adults aged ≥65 years, accelerated increases in the energetic cost of walking distinguished those who later developed cognitive impairment, independent of usual walking speed. A higher baseline walking energy cost was also associated with increased risk of cognitive impairment among adults aged ≥75 years. These findings suggest that physiological mechanisms underlying mobility may provide early insight into AD/ADRD risk beyond traditional measures of physical function.

Poster - IDa120

Psychometric properties of the International Fitness Scale in postpartum women and its association with physical activity, depressive and anxiety symptoms: Preliminary results

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Background: Mental health disorders are common during the perinatal period, and fitness may help protect against them. The IFIS questionnaire is a widely used self-perceived fitness tool and has shown to be valid and reliable in pregnant women. However, its reliability and factorial structure during the postpartum period have not yet been established.

Objective: (i) To examine the IFIS reliability and factorial structure, in postpartum women and; (ii) to explore the association of IFIS scores with physical activity levels, depressive and anxiety symptoms.

Materials and methods: The study comprised 109 Spanish postpartum women (34.56 [4.08] years). Self-perceived fitness was measured using the IFIS, physical activity was measured using the Pregnancy Physical Activity Questionnaire, depressive and anxiety symptoms were measured using the Edinburgh Postnatal Depression Scale (EPDS) and the Generalized Anxiety Disorder-7 (GAD-7) questionnaire, respectively. Factorial structure was evaluated using confirmatory factor analysis and associations between IFIS, physical activity, depression and anxiety symptoms were also examined using Spearman's correlations. Reliability was assessed using Cronbach's alpha and McDonald´s Omega.

Results: The one-factor structure showed acceptable fit of the data to the model (CFI =.972; NNFI =.944; RMSEA = 0.145; SRMR = 0.031). Positive and significant correlations were observed between the IFIS and moderate/-to-vigorous physical activity, measured as MET-hours/day (ρ = .235; p = .014) and hours/day (ρ = .211; p = .027). A negative and significant correlation was observed between the IFIS and depressive symptoms (ρ = −0.285; p = 0.003), whereas no significant correlation was found with anxiety symptoms (ρ = −0.181; p = 0.061). The IFIS showed high reliability (α = 0.88; ω = 0.91).

Conclusions: The IFIS showed a unidimensional structure, high internal consistency and evidence of convergent validity with physical activity levels and depressive symptoms in postpartum women. The results support the usefulness of the IFIS as a simple and feasible tool for assessing perceived fitness in the postpartum period.

Poster - IDa121

Cycling and Mental Well-being of International University Students: A Qualitative Interview Study

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Background:

Moving to a new country and starting university can be stressful for international students. Previous studies have shown that active transport, especially cycling, has positive effects on physical and mental health. However, only a small number of studies have explored how cycling influences the everyday life, mental well-being, and confidence of international students. The aim of this study was to explore how international students perceive the influence of cycling on their mental well-being, studying, and social life.

Methods:

A qualitative study was conducted using semi-structured interviews with eight international Master's and PhD students from Friedrich-Alexander University Erlangen-Nürnberg, Germany. Participants were between 24 and 30 years old, included both genders and came from different countries. The interviews included questions about cycling experience, mood, stress, studying, concentration, daily routines, and social connections. All interviews were audio-recorded, transcribed anonymously, and analysed using thematic analysis.

Results:

The first analysis showed three main themes related to psychological and cognitive outcomes: mood enhancement and stress reduction, improved cognitive focus and study productivity, and social integration and independence. Most participants described cycling as a way to improve their mood and reduce stress. Many reported feeling more focused and productive after cycling, especially before studying. Participants also mentioned that cycling helped them spend more time outdoors, build healthy daily routines, and feel more independent. Some participants believed that cycling events could help students make new friends and become better integrated into university life.

Conclusions:

The findings suggest that international students see cycling as more than just a way to travel. They described cycling as an activity that supports mental well-being, helps with studying, and may improve social integration. More research with a larger number of participants is needed to better understand these experiences and support future university health promotion programmes.

Poster - IDa122

Psychosocial Pathways Linking Physical Activity to Depressive Symptoms in University Students: A Serial Mediation Study

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Background: Depressive symptoms are a major mental health concern among university students. Physical activity is associated with better psychological well-being, but the psychosocial mechanisms linking active lifestyles to depressive symptoms remain insufficiently understood.

Objective: To examine whether perceived social support and self-efficacy independently and sequentially mediate the association between physical activity and depressive symptoms in Chinese university students.

Methods: A cross-sectional survey was conducted among 1,040 undergraduate students. Participants completed validated measures of physical activity, perceived social support, general self-efficacy, and depressive symptoms. Pearson correlations and bootstrap-based serial mediation analyses (PROCESS Model 6; 5,000 resamples) were performed, controlling for gender and grade level.

Results: Higher physical activity was associated with greater perceived social support and self-efficacy and with fewer depressive symptoms. The total association between physical activity and depressive symptoms was significant (B = -0.210, 95% CI -0.239 to -0.180). The direct association remained significant after inclusion of the mediators (B = -0.090, 95% CI -0.121 to -0.059). The total indirect effect was -0.120 (95% CI -0.141 to -0.102), accounting for 57.14% of the total association. Significant indirect pathways were observed through perceived social support alone (effect = -0.093), self-efficacy alone (effect = -0.013), and the sequential pathway from perceived social support to self-efficacy (effect = -0.014); all bootstrap confidence intervals excluded zero.

Conclusions: Physical activity was associated with fewer depressive symptoms both directly and through social and psychological resources. Physical activity initiatives for university students may provide greater mental health benefits when they also promote supportive social interaction, mastery experiences, and confidence in coping with challenges. Longitudinal and intervention studies using objective activity assessment are needed to establish temporal and causal relationships.

Keywords: Physical activity; Depressive symptoms; Social support; Self-efficacy; University students; Serial mediation

Poster - IDa123

Cognitive and academic performance in schoolchildren with and without ADHD: findings from the Break4Brain project

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Although attention-deficit/hyperactivity disorder (ADHD) has been associated with differences in cognitive functioning and academic performance, the magnitude of these differences may vary depending on the domain assessed. This study compared cognitive and academic performance in schoolchildren with and without ADHD participating in the Break4Brain project. Sixty-three schoolchildren participated (11.12 ± 0.96 years; 36.5% girls), including 32 with ADHD and 31 without ADHD. Working memory, inhibitory control (response accuracy and speed), sustained attention (stimulus discrimination and response-time consistency), general cognitive ability, and academic fluency were assessed. Group comparisons were conducted using linear regression models adjusted for age and sex to limit the potential influence of both variables. The magnitude of between-group differences was expressed using Hedges' g, and the Holm correction was applied to control the family-wise error rate across the seven comparisons. Schoolchildren with ADHD showed greater response-time inconsistency during sustained attention (g=1.01; pHolm=0.001), greater response-time interference during inhibitory control (g=0.94; pHolm=0.010), lower general cognitive ability (g=−0.76; pHolm=0.018), and lower academic fluency (g=−0.71; pHolm=0.018). No significant differences were observed in working memory, response accuracy during inhibitory control, or stimulus discrimination, all with pHolm≥0.088. ADHD-related differences were more evident in response-time variability and greater slowing in the presence of distracting stimuli than in response accuracy, and were not uniform across all domains assessed. These findings will help contextualize responses to the experimental active-break conditions of the Break4Brain project and examine their relationships with schoolchildren's physical activity, physical fitness, and motor competence.

Poster - IDa125

Classroom movement strategies to improve to increase physical activity and to improve cognition and academic performance in school-aged population: protocol of the Break4Brain hybrid type II implementation-effectiveness trial

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Background: Schools are a key setting for promoting physical activity and supporting children's cognitive and academic development. Classroom-based movement strategies may offer a feasible way to increase physical activity, with potential benefits for cognition and academic performance. However, evidence from routine school trials remains limited, including how classroom-movement strategies are implemented. Objective: To describe Break4Brain Evolution, a digitally supported classroom-movement programme designed to improve physical activity patterns, cognition and academic performance in school-aged population, and to examine its implementation under routine school conditions. Methods: A type II hybrid implementation-effectiveness trial will be conducted from April 2026 to December 2027 using a mixed-methods design. Break4Brain Evolution will be delivered through a digital platform providing teacher training, classroom resources, planning tools, monitoring and support. For implementation component, the programme will be offered to preschool, primary and secondary schools across Spain, aiming to include at least 50 classrooms and students aged 3-16 years. Implementation outcomes will be evaluated using RE-AIM and Proctor's outcomes. Data from school leaders, teachers, students and platform metrics will be collected at pre-implementation, baseline, mid-implementation, post-intervention and maintenance to assess reach, adoption, fidelity, adaptations, acceptability, feasibility and maintenance. The effectiveness component will use a cluster-randomised controlled design in six primary schools in Mallorca (Spain) including 12 classrooms from grades 5 and 6, with approximately 300 students aged 10-12 years allocated to intervention or usual practice. Effectiveness outcomes will be assessed at baseline and post-intervention, with selected outcomes reassessed at follow-up. Outcomes will include selective attention, teacher-rated and performance-based executive functions, academic performance, and device-measured 24-hour movement behaviours. Intervention effects will be evaluated using mixed-effects models accounting for clustering. Expected contribution: This study will provide evidence on whether a classroom-movement programme improves physical activity patterns, cognition and academic performance in school-aged population, while identifying conditions supporting adoption, delivery and maintenance.

Poster - IDa126

Patients' Perceptions of Virtual Reality as a Psychological Treatment for Depression: A Systematic Review and Thematic Synthesis

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Background: Depression is one of the leading causes of disability associated with reduced quality of life, increased risk of chronic illness and mortality. Virtual reality (VR) provides opportunities for new psychological treatments in depression.

Aim: This study aimed to synthesize evidence of perceptions and acceptability of VR for depression treatment.

Methods: PubMed, Web of Science, Scopus, PsycINFO, PubPsych and grey literature databases were searched from inception to February 2026. This study followed the guidance of the Cochrane Qualitative and Implementation Methods Group and ENTREQ. Confidence in review findings was assessed using the GRADE-CERQual tool, and methodological quality with the CASP tool.

Results: Eight studies (273 patients) were included. Five themes were identified. Theme1: VR as an embodied, engaging, and affectively immersive therapeutic medium, captures how participants experienced VR as perceptually distinct from other therapeutic formats, through immersion, physical sensation, novelty, and affective engagement. Theme 2, VR as a facilitator of emotional and cognitive therapeutic work, describes the therapeutic processes patients identified as operating within VR, including emotional access, insight, cognitive restructuring, and skill acquisition. Theme 3: VR as a psychologically safer and more accessible therapeutic space, reflects participants' perceptions of VR as reducing social threat and increasing convenience relative to conventional formats. Theme 4: Conditions that constrain or disrupt therapeutic engagement in VR, documents the physical, technical, and psychological factors that patients identified as barriers to VR-mediated treatment. Theme 5: The need for tailoring and human-centred adaptation in VR therapy, articulates participants' demand for greater personalisation of VR content, environments, and delivery structures. The GRADE-CERQual ratings ranged from high to moderate confidence, with any subthemes rated as low.

Conclusions: VR is perceived as an acceptable and useful, offering therapeutic opportunities beyond traditional approaches and provide guidance for designing more immersive, user-centred, and effective VR interventions.

Poster - IDa127

Time spent in physical activities, TV watching and sleep and its association with executive cognitive functioning in middle age and older adults: an isotemporal substitution analysis

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Background: Time spent in physical activities, sedentary behavior and sleep during the day are interrelated and are differentially associated with cognition. Most studies have not analyzed these three activities simultaneously when examining this association. We examined the association between these activities and cognitive functioning and estimated the influence of time reallocation of sedentary behavior (TV watching) for other activities on cognitive functioning.

Methods: Baseline adult data (≥ 40 years) from Lifelines Cohort study (n=58,582) was used to assess the association between self-reported time spent in TV-watching, sleep, and physical activities (active commuting, leisure, sports, household, and work) with cognition, using multivariable linear regression analyses. The Ruff Figural Fluency Test (RFFT), a paper and pencil test, was used to evaluate nonverbal fluency and executive cognitive functioning (score 0-175, with higher scores indicating good executive cognitive functioning). Isotemporal substitution analyses were applied to estimate the impact of time replacement of TV-watching by other time-use activities on cognitive functioning. Analyses were stratified by age (middle age (<60y) and older adults) and sleep duration (short, normal (7–8 h/day), and long).

Results: In adults with normal sleep (75%), TV-watching time was inversely associated with executive cognitive functioning in middle aged (β -0.30, 95%CI -0.41, -0.19) and older (β -0.33, 95%CI -0.51, -0.14) adults. Replacing 30 min of TV-watching with leisure (β 0.22, 95%CI 0.11, 0.34), sports (β 0.51, 95%CI 0.48, 0.97), household (β 0.21, 95% CI 0.09, 0.33), or work (β 0.39, 95%CI 0.28, 0.50) showed a stronger and positive association with executive cognitive functioning. Associations were less pronounced in short sleepers, and absent among long sleepers, aged 60 years and older.

Conclusions: Substituting 30 min of TV-watching by with physical activities may be a potential strategy to improve or preserve executive cognitive functioning. Future experimental and cohort studies are needed to confirm this hypothesis.

Poster - IDa128

Beyond BMI: Deep Neck White Adiposity and Muscle Fat Infiltration are Inversely Associated with Plasma ptau217: Results from AGUEDA study.

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Background: Plasma ptau217 and ptau217/$A\beta_{42}$ are key Alzheimer's disease (AD) biomarkers, but their levels may be confounded by hemodilution in individuals with high adiposity. As Body mass index (BMI) fails to capture anatomical fat distribution, we examined how neck composition associates with these biomarkers.

Methods: 89 cognitively normal participants (57% women) from the AGUEDA study were included. Neck composition was quantified at the C3 vertebral level to determine Total Neck Adipose Tissue (NAT) volume, Neck Muscle (NM) volume, and their respective ponderated Mean Fat Fraction (FF). Additionally, subcutaneous and deep NAT volumes were estimated. Plasma ptau217 and ptau217/$A\beta_{42}$ ratio were measured. Linear models were adjusted for age, sex, education, and APOE4 (Model 1), plus BMI (Model 2).

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Results: No significant associations were observed of total NAT (volume or FF), subcutaneous NAT volume or NM volume with ptau217 in both models (β range -0.004 to 0.020; p>0.131). However, compartmentalized analysis revealed that deep NAT volume was negatively associated with ptau217 in model 1 (βstd= -0.249, p= 0.029) and model 2 (βstd= -0.310, p= 0.039). Similarly, NM FF was significantly associated with ptau217 in model 1 (βstd= -0.270, p= 0.028) and model 2 (βstd = -0.288, p = 0.045). No significant associations were found between neck composition and the ptau217/$A\beta_{42}$ ratio in both models (β range -0.086 to 0.038; p>0.135).

Conclusion: Deep neck adipose tissue and neck muscle fat fraction were independently associated with lower

plasma ptau217 levels, regardless of BMI, suggesting that these associations are unlikely to be explained by hemodilution. Clinically, this raises the possibility that plasma ptau217 levels may be systematically underestimated in individuals with higher neck fat or muscle fat infiltration. Accounting for regional neck composition may therefore be important to improve the accuracy of blood-based biomarker assessment in aging populations.

Poster - IDa129

Exercise as a remedy: Running improves metabolic, inflammatory, and performance profiles in cafeteria diet-induced obese rats

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Obesity, which the WHO recognizes as an epidemic, is mainly caused by a sedentary lifestyle and a diet rich in fats and carbohydrates. In laboratory settings, the cafeteria diet (CAF) consists of products such as biscuits, sausages, cheese, chips, and chocolate, which can lead to obesity.

The experiment was conducted on male Wistar rats divided into groups: 1) CAF with physical activity - voluntary running (CAF+R), 2) control diet with running (C+R), 3) CAF without running (CAF-NR), and 4) control diet without running (C-NR). Running rats had free access to running wheels for seven weeks, while all animals were maintained on their diets for ten weeks. Body mass and metabolic status (glucose, triglycerides, cholesterol, leptin, insulin levels), and the marker of inflammation – interleukin-6 (IL-6), were assessed using ELISA tests. The parameters of physical activities - total distance, mean daily distance, and percent of time spent running were measured using the Multifunction Interface NG system.

The data have shown that: 1) In CAF group, running decreased cholesterol, leptin, and slightly glucose levels compared to CAF-R group; 2) Running decreased interleukin-6 (IL-6) levels despite diet; 3) In C and CAF rats, running decreased body weight; 4) The CAF animals reached higher parameters of physical activities compared to controls. The remaining data are currently being analyzed.

We concluded that running had a protective effect on metabolic parameters, particularly cholesterol and leptin levels in CAF rats. Moreover, running reduces body weight and IL-6 levels. We also noticed that the CAF diet increased physical activity in rats. Thus, the described rat model helps elucidate the mechanisms underlying the beneficial effects of physical activity on metabolic and inflammatory parameters in obesity.

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Poster - IDa130

Voluntary running improves metabolic and inflammatory profiles in Western-type diet-induced obesity in rats.

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Excessive consumption of highly processed food and reduced physical activity are largely attributable to the obesity epidemic. A Western-type diet (WD) is designed to mimic the nutritional profile of an unhealthy human diet, high in fat, refined sugars, and low in fiber. This diet leads to obesity, characterized by reduced insulin and leptin sensitivity.

In the experiment, Wistar male rats were fed a commercially available (Altromin) control diet (C, n=12) and a Western-type diet (WD, n=12) for 6 weeks. Then rats were distributed into four groups: C-NR, control non-run; C+R, control run; WD-NR, Western-type diet non-run; and WD+R, Western-type diet run. Voluntary wheel running was provided for 4 weeks. Metabolic status (glucose, cholesterol, leptin, insulin levels), and markers of stress (CORT) and inflammation (interleukin-6, IL-6), were assessed in serum using ELISA assays. Body weight was monitored once a week. The parameters of physical activities - total distance, mean daily distance, and percent of time spent running were measured using Multifunction Interface NG (Ugo Basile).

Data show that cholesterol and leptin levels increased in WD+R and WD-NR compared with C+R and C-NR groups. In contrast, CORT level was elevated only in the WD-NR group. Furthermore, in the WD+R group, insulin and IL-6 levels were lower than in the WD-NR group. Additionally, glucose levels were lower in C+R than in C-NR. Finally, the WD animals covered a greater total distance and spent more time running than controls. The remaining data are currently being analyzed.

We concluded that running significantly decreased body weight, insulin, glucose, and IL-6 levels. Thus, the physical activity reprograms metabolism and inflammation in a favorable direction, often even before major weight loss happens.

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Poster - IDa131

Co-designing the prototype of a physical activity website (TeenFit) through a stakeholder workshop

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Background: Despite the visible benefits of physical activity (PA) for adolescents' physical and cognitive health, more than 80% of adolescents do not meet the daily PA recommendations. Mobile health applications (apps) offer an accessible and adaptable tool for the promotion of PA, yet unlike other fields, no web-based repositories currently compile digital tools for sport and PA. Therefore, the TeenFit project aims to co-design a website to collect PA apps for adolescents. This abstract describes the development of the website's prototype through stakeholder workshops. Methods: A mixed-methods, co-design approach has been employed. Adolescents, caregivers, educators, and health professionals participated as stakeholders in different dynamic activities through which they gave their opinions, views, and experiences. Quantitative data (i.e., demographic data and experience during co-design) were collected via questionnaires at the end of the sessions. Qualitative

data were gathered through audio and video recordings of the workshops and analyzed using inductive thematic analysis employing a process of abstraction. In addition, a frequency analysis of the resulting categories was conducted to identify the most recurring and important themes. Results: A total of seven co-design workshop sessions were conducted with 37 participants (9 adolescents, 6 caregivers, 8 educators, 14 health professionals). Emerging topics were analyzed and grouped into eight categories and two overarching themes: (1) Website Aspects, comprising six categories related to participants' expectations about the website's visual appearance and functionalities, and (2) Physical Activity Considerations, with two categories related to participants' beliefs about PA. The most discussed categories were Searching strategy (23,92%) and Visual design (21,09%), highlighting the importance of personalization and visual appeal as key components for the website. Conclusions: These findings provide insights into the development of the TeenFit website and reinforce the value of co-designing tools involving end-users in order to enhance engagement, usability, and reliability.

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