Effects of Stretching, Aerobic, and Yoga Exercise on Neurocognition among Middle Aged and Older Adults: Protocol for the SAY Exercise Trial

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Introduction

• Prevalence of cognitive decline in older adults is predicted to be 11.1% (1 in 9) among adults. >65 show greater prevalence at 11.7% compared to those 45-65 years-old being at 10.8%.
• Volume of the brain and/or its weight declines with age at a rate of approximately 5% per decade after 40.
• Physical activity is one of the biggest factors for mitigating cognitive decline in older age.

Aims

• Examine the effects a 6-month exercise intervention on the cognitive health of older adults (55-79).
• Look at structural and functional changes in the brain that may arise among older adults (55-79) as a result of physical activity intervention.
• Analyze potential physiological changes such as inflammatory and molecular markers due to change in cardiorespiratory fitness.

Participants

• There will be 168 participants for the duration of the entire study (3 waves)
• Male and female older adults who are not physically active

Inclusion Requirements

• Must be between the ages of 55-79 years old
• Right-handed
• Be MRI compatible
• TICS-M (Modified Telephone Interview for Cognitive Status) score of 32 or higher
• Have no health conditions that could be made worse by exercise as well as no diagnosis of dementia or other cognitive impairments
• Not physically active for more than 30 minutes twice a week
• Good hearing and vision
• Ambulatory
• Must intend to remain in Champaign-Urbana area over duration of study

Method

EPL Exercise Leader leading participants through stretches

Intervention

• Randomly assigned to a stretching and toning, aerobicics, or yoga exercise group.
• 3 times a week for 1 hour over the course of 6 months.
• Exercise sessions will be a hybrid format; participants will choose one day a week to attend in person, sessions and will attend on zoom the other two days of the week.
• Participants will be provided with a Fitbit over the duration of the study, which will be worn during exercise sessions.
• Participants will complete exercise and home logs where they will record information from their exercise session.

Assessments

• Graded Exercise Test
• Functional Fitness Test
• Fasting Blood draw
• Cognitive Tests
• Psychosocial Questionnaires
• MRI and fMRI

Expected Outcomes

Cognitive Function

• Improvement in areas of cognition such as memory, attention and executive function will be observed in all three groups.

Brain Structure & Function

• Hippocampus will demonstrate a smaller reduction in size over time.

Physiological Biomarkers

• Observation of positive effects on physiological biomarkers with greater fitness potentially correlating with greater effect.

Cardiovascular Fitness

• A sizeable change in fitness for aerobic group followed by yoga with little to no change for stretching and toning group.

Changes in brain volume by the decade

References


Participant during a GXT with EPL staff

EPL staff preparing for an MRI session.