Spatial Navigation Skills in Alzheimer's Disease – A Meta-analysis.

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Introduction

The purpose of this project is to understand the role of Spatial Navigation skills in Alzheimer's Disease. This project specifically focuses on the older population. We want to understand if spatial navigation can be used as an early diagnosis criteria for AD

Background

A common form of dementia is Alzheimer's Disease (AD). One of the earliest symptoms noted in AD is spatial disorientation.. In a prior meta-analysis that examined spatial navigation skills in individuals with Mild Cognitive Impairment (MCI), it was observed that they diverged from cognitively healthy older adults by a standardized mean difference of 0.9. MCI represents a state between cognitively healthy aging and dementia.

References

-Anderson, Steve W.; Dawson, Jeffrey; Uc, Ergun; Rizzo, Askan Nazan (2015)Cogntive Functioning differentially predicts different dimensions of older drivers on- road safety

- Bellaseen V; Igol K; de Souza LC; Dubois B, Rondi-Reig L (2012)Temporal order memory assessed during spatio-temporal navigation as a behavioral cognitive marker for differential Alzheimer's Disease diagnosis.

Methods

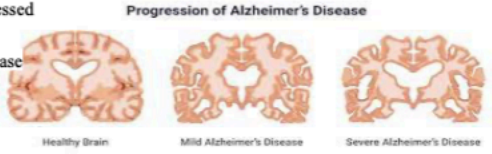
Objective: Evaluate the degree to which individuals with AD exhibit cognitive underperformance compared to cognitively healthy older individuals in spatial navigation tasks.

Collect characteristics and demographics from articles:

-Title -Education
-Year of Publication -Age
-Country of Study -Gender

Code for spatial navigation tasks and orientation tasks:

-Way of test administration
-AD criteria
-Type of measure (time/accuracy)
-Hedge's g: A standardized mean difference, serves as the measure of effect size in this assessment.



Results

The present dataset comprises 48 effect sizes from 21 studies, involving a total of 483 participants (212 AD, 271 healthy older adults). The overall findings indicate a statistically significant difference ($p = 0.05$) in navigation skills, with healthy older adults exhibiting significantly better performance compared to individuals with AD, as evidenced by the standardized mean difference (SMD) of 1.3.

Discussion

- To see if spatial navigation can be used as an early diagnosis
- Get more information on Alzheimer's Disease
- In the future we intend to compare MCI and AD disease