AD Prevent-Detect: Evaluation of Cognitive Screening and Cognitive Training for People at risk of Dementia.

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CCS Concepts

• **Applied computing→Health care information systems**
• **Human centered computing→sHCI design and evaluation methods**

Keywords

Dementia; Cognitive Training; Cognitive Screening; Evaluation; Patient and Public Involvement

1. INTRODUCTION

Working with our European collaborators on an industry-led H2020 Fast Track to Innovative project (2018-2020) with technology company Brain+ along with University of Oxford, Aarhus University, Alzheimer Europe and the European Brain Council, we intend to identify the perceptions of target user-groups about cognitive training and screening technologies early in the evaluation process in order to provide guidance about the structure of a future clinical trial. Michael P. Craven and Kyle Harrington will take an iterative and user-centred approach to evaluation and design to identify any potential concerns or barriers, as well as to discover other important factors governing use, such as motivation, trust and adherence. To do this, we will enlist Patient and Public Involvement (PPI) groups to inform and advise over the duration of the project. Michael Craven's research focusses on design and evaluation of healthcare technologies and he is an advocate of the principles of co-design and meaningful PPI in medical device and digital health innovation [1]. Kyle Harrington's research interests include digital monitoring methods for people with dementia and their carers [2].

Max L. Wilson's recent work has involved real time measurements of cognitive workload using Functional Near-Infrared Spectroscopy [5]. In a parallel investigation, Wilson will also conduct a longitudinal study to investigate whether the Brain+ AD Prevent component (Brain Training) has the potential to improve performance on cognitive tasks and lead to an overall reduction in cognitive workload, as estimated by functional near-infra red spectroscopy (fNIRS) measurements of the pre-frontal cortex.

We will take a broad view of evaluation and consider a variety of stakeholder perspectives, quantifiable outcome measures and existing clinical care pathways to suggest how such technology could be integrated into future dementia care. We wish to discuss proposals and plans for this work with other individuals working within the area of Public and Patient Involvement, Digital Health and Serious Gaming.

2. EXISTING RESEARCH

Digitised cognitive training promises novel, easily administered and low-cost methods for slowing the decline of cognitive abilities due to neurodegenerative illness and numerous studies have investigated the effects of cognitive training on a variety of outcomes within diverse populations; with many studies showing moderate benefits within areas such as verbal memory, nonverbal learning, attention, verbal cognition, psycho-social functioning and working memory, yet there remains disagreement about their efficacy [3].

Evidence suggests factors such as educational attainment, leisure activities and career choice may mitigate the detrimental effects of neuropathology on cognitive performance [4]. Cognitively stimulating activities may therefore help to build up cognitive reserve, thus delaying the onset of cognitive decline caused by dementia.

Brain training applications for use of those at-risk from dementia also present a further opportunity; unobtrusive cognitive screening, which may be able to detect pre-symptomatic dementia; thus, enabling patients, carers and clinicians to make informed choices about future care options and to treat those symptoms which are susceptible to early intervention.

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3. REFERENCES

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