



Featured Article

Speed of processing training results in lower risk of dementia

 Jerri D. Edwards^{a,*}, Huiping Xu^b, Daniel O. Clark^c, Lin T. Guey^d, Lesley A. Ross^e,
Frederick W. Unverzagt^f
^aDepartment of Psychiatry and Behavioral Neurosciences, University of South Florida, Tampa, FL, USA^bDepartment of Biostatistics, The Richard M. Fairbanks School of Public Health and School of Medicine, Indiana University, Indianapolis, IN, USA^cDepartment of Medicine, Indiana University Center for Aging Research, Regenstrief Institute, Inc., Indianapolis, IN, USA^dModerna Therapeutics, Cambridge, MA, USA^eDepartment of Human Development and Family Studies, The Pennsylvania State University, University Park, PA, USA^fDepartment of Psychiatry, Indiana University School of Medicine, Indianapolis, IN, USA**Abstract**

Introduction: Cognitive training improves cognitive performance and delays functional impairment, but its effects on dementia are not known. We examined whether three different types of cognitive training lowered the risk of dementia across 10 years of follow-up relative to control and if greater number of training sessions attended was associated with lower dementia risk.

Methods: The Advanced Cognitive Training in Vital Elderly (NCT00298558) study was a randomized controlled trial (N = 2802) among initially healthy older adults, which examined the efficacy of three cognitive training programs (memory, reasoning, or speed of processing) relative to a no-contact control condition. Up to 10 training sessions were delivered over 6 weeks with up to four sessions of booster training delivered at 11 months and a second set of up to four booster sessions at 35 months. Outcome assessments were taken immediately after intervention and at intervals over 10 years. Dementia was defined using a combination of interview- and performance-based methods.

Results: A total of 260 cases of dementia were identified during the follow-up. Speed training resulted in reduced risk of dementia (hazard ratio [HR] 0.71, 95% confidence interval [CI] 0.50–0.998, $P = .049$) compared to control, but memory and reasoning training did not (HR 0.79, 95% CI 0.57–1.11, $P = .177$ and HR 0.79, 95% CI 0.56–1.10, $P = .163$, respectively). Each additional speed training session was associated with a 10% lower hazard for dementia (unadjusted HR, 0.90; 95% CI, 0.85–0.95, $P < .001$).

Discussion: Initially, healthy older adults randomized to speed of processing cognitive training had a 29% reduction in their risk of dementia after 10 years of follow-up compared to the untreated control group.

© 2017 The Authors. Published by Elsevier Inc. on behalf of the Alzheimer's Association. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Keywords:

Cognitive training; Cognitive intervention; Dementia; Useful field of view training

1. Introduction

Dementia affects 14% of persons aged 71 years and older and 30% of those over the age 90 [1]. A 2010 study estimated that 34.4 million people have dementia worldwide with estimated formal and informal care costs of \$422 billion [2]. Interventions that postpone dementia onset by even two years would cut projected dementia prevalence in 2047 by 22% [3].

Results were presented at the 2016 Alzheimer's Association International Conference in Toronto, Canada.

*Corresponding author. Tel.: (813)974-6703; Fax: (813) 974-3236.

E-mail address: jedwards1@usf.edu

<https://doi.org/10.1016/j.trci.2017.09.002>

2352-8737/© 2017 The Authors. Published by Elsevier Inc. on behalf of the Alzheimer's Association. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

The Advanced Training in Vital Elderly study (ACTIVE) [4] was a randomized trial on the efficacy of three different types of cognitive training to preserve cognitive and daily function in older adults. Participants were randomized to either strategy-based memory or reasoning training, speed of processing training, or no-contact control conditions [4]. Cognitive training produced longitudinal improvements on the targeted cognitive outcomes, and trained participants self-reported less difficulty completing instrumental activities of daily living (IADL) 10 years later [5–7]. As dementia by definition involves functional impairments, of interest is whether these interventions reduced dementia risk. Previous analysis of ACTIVE using a combination of self-report and performance-based definitions of dementia found no difference in rate of dementia by training arm at 5 years [8].

Importantly, ACTIVE subanalyses have shown that, as hypothesized [4], exposure to booster training was associated with larger improvements in cognitive performance and wider transfer to daily function, particularly for the reasoning and speed arms [5,9,10]. Participants randomized to greater doses of speed training demonstrated improved functional performance at 1, 2, and 5 years [5,9]. Exposure to booster training was associated with additional improvement in targeted cognitive performance at 10 years for participants receiving reasoning and speed training [5,14,15]. Thus, consideration of training dose is necessary.

Given the additional follow-up in ACTIVE and the indications that booster training enhances outcomes, it was of interest to reexamine the relation between training and dementia across 10 years. We hypothesized that exposure to cognitive training would lower the risk of dementia and that the benefit would be greatest for those attending more training sessions (i.e., booster training).

2. Methods

2.1. Study design and participants

ACTIVE was a multi-site, single-blind, 4-arm, randomized trial (NCT00298558, see Fig. 1). Participants were community-dwelling adults aged 65 years and older. Participants were excluded if they had significant cognitive dysfunction (Mini-mental State Examination [MMSE] < 23), any functional impairment (self-reported difficulty indexed by the Minimum Data Set [MDS] home care), poor vision, self-reported diagnoses of Alzheimer's disease, stroke, certain cancers, or communication difficulties [4]. Written informed consent was obtained. The study was approved by site Institutional Review Boards.

2.2. Procedures

The study protocol is detailed elsewhere [4]. Briefly, eligible participants completed baseline assessments of cognitive (i.e., memory, reasoning, and speed of processing) and functional abilities (i.e., self-report and performance-based measures of functional abilities) and were randomized (Fig. 1). Memory training focused on instruction and practice in strategy use for verbal episodic memory. Reasoning training focused on instruction and practice in strategy use related to problem-solving and serial patterns. Speed training focused on computerized, visual-perceptual exercises designed to increase the amount and complexity of information quickly processed. Each training arm consisted of ten 60–75 minute sessions over 5 to 6 weeks, delivered to small groups of participants. A subset of participants completing at least 80% of the training sessions was randomly selected to receive booster training (four 75-minute sessions) at 11 and 35 months after completion of the initial training. Thus,

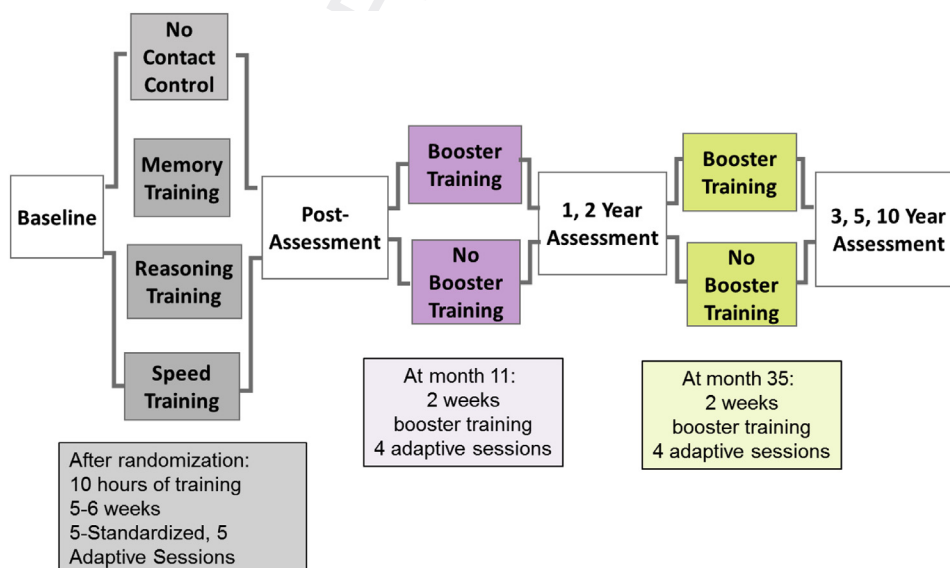


Fig. 1. The Advanced Cognitive Training in Vital Elderly study design. Participants were randomized to one of four training arms and assessed immediately after training or an equivalent delay. Assessments were completed at 1, 2, 3, 5, and 10 years. A subset of participants completed four additional booster training sessions at 11 months and again at 35 months.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات