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Review

Cognitive stimulation for dementia: A systematic review of the evidence of effectiveness from randomised controlled trials

Elisa Aguirre[a,*], Robert T. Woods[b,1], Aimee Spector[c,2], Martin Orrell[a,3]

[a] University College London, Charles Bell House, 67-73 Riding House Street, London W1W 7EJ, England, United Kingdom
[b] DSDC Wales, Bangor University, 45 College Road, Bangor, Gwynedd LL57 2DG, Wales, United Kingdom
[c] University College London, 1-19 Torrington Place, London WC1E 7HB, England, United Kingdom

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ABSTRACT

Cognitive stimulation is a psychological intervention widely used in dementia care, which offers a range of activities for people with dementia and provides general stimulation of cognitive abilities. This systematic review evaluates the effectiveness of cognitive stimulation in dementia. The review included studies from the Specialized Register of the Cochrane Dementia and Cognitive Improvement Group, called ALOIS. This yielded ninety-four studies, of which fifteen were randomised controlled trials meeting the inclusion criteria. The analysis included 718 subjects (407 receiving cognitive stimulation and 311 in control groups). Results were subjected to a meta-analysis. A consistent significant benefit to cognitive function was identified following treatment and the benefits appeared to be over and above any medication effects. This remained evident at follow-up up to three months after the end of treatment. In secondary analyses, with smaller total sample sizes, significant benefits were also noted for quality of life and well-being, and on staff ratings of communication and social interaction. No differences in relation to mood, activities of daily living or challenging behaviour were noted. There is consistent evidence that cognitive stimulation interventions benefit cognitive function and aspects of well-being. Cognitive stimulation should be made more widely available in dementia care.

1. Introduction

Interventions with a cognitive focus have long been used in dementia care, and developed in parallel with approaches emphasising the stimulation of the senses (Woods and Britton, 1977). One of the first established non-pharmacological interventions for dementia that focused on improvement of cognitive abilities was Reality Orientation (RO) (Taulbee and Folsom, 1966). RO included, amongst other interventions, classroom sessions, normally held daily for 30 minutes where a small group of participants were presented with basic personal and current information and a variety of materials used, such as individual calendars, word-letter games, building blocks and large piece puzzles. A Reality Orientation board would be used in each session and would list the name of the unit and its location, the day, date, weather, current events, etc. The first controlled evaluation of RO classes was reported in the UK by Brook et al. (1975), reporting positive results for cognitive and social functioning in patients A number of controlled studies of RO followed, with outcome measures typically including assessments of orientation, other aspects of cognitive functioning and level of independent functioning (Holden and Woods, 1995). However, this approach raised some concerns in relation to its clinical significance for people with dementia and attracted some criticism when used in a mechanical, inflexible manner (Burton, 1982; Dietch et al., 1989; Powell-Proctor and Miller, 1982) with one set of guidelines on the management of dementia (APA, 1997) even cautioning against its use. However, a Cochrane review specifically examining RO (Spector et al., 2000) that included a total of 6 RCTs with 125 participants overall (67 in experimental and 58 in control groups) concluded that this therapy had cognitive and behavioural benefits for people with dementia. Following Breuil et al. (1994), the term 'cognitive stimulation' is now widely used to describe approaches, including RO, which have a general cognitive focus. This builds on the positive aspects of RO, whilst ensuring that it is implemented in a coherent, person-centred and sensitive manner (Spector et al., 2001; Woods, 2002). Whilst the terms 'cognitive training', 'cognitive stimulation' and 'cognitive rehabilitation' have been used almost interchangeably in the past, Clare and Woods (2004) established the following definitions.

* Corresponding author. Tel.: +44 20 7679 9452; fax: +44 20 7679 9426.
E-mail addresses: e.aguirre@ucl.ac.uk (E. Aguirre), b.woods@bangor.ac.uk (R.T. Woods), a.spector@ucl.ac.uk (A. Spector), m.orrell@ucl.ac.uk (M. Orrell).
[1] Tel.: +44 01 2483 82463.
[2] Tel.: +44 20 7679 1844; fax: +44 20 7679 1844.
[3] Tel.: +44 20 7679 9452; fax: +44 20 7679 9426.

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(a) 'Cognitive stimulation' as engagement in a range of activities and discussions (usually in a group) aimed at general enhancement of cognitive and social functioning; (b) 'cognitive training' as guided practice on a set of standard tasks designed to reflect particular cognitive functions with a range of difficulty levels to suit the individual's level of ability; and (c) 'cognitive rehabilitation' as an individualised approach where personally relevant goals are identified, and the therapist works with the person and his/her family to devise strategies to address these. The emphasis is on improving performance in everyday life, rather than on cognitive tests, building on the person's strengths and developing ways of compensating for impairment.

With the Cochrane review of RO being superceded by these developments, it was timely to consider the evidence base for cognitive stimulation as defined by Clare and Woods and excluding cognitive training and cognitive rehabilitation interventions. Accordingly, the aim of this study was to evaluate the effectiveness of cognitive stimulation trials in dementia. The reported systematic review was carried out with the Cochrane Collaboration Cognitive Impairment and Dementia group, based in Oxford, United Kingdom (Woods et al., 2012).

2. Methods

2.1. Search method

A systematic search for randomised controlled trials (RCTs) evaluating the effectiveness of cognitive stimulation programmes for dementia was conducted. A combination of the search terms cognitive stimulation, reality orientation, memory therapy, memory groups, memory support, memory stimulation, global stimulation and cognitive psychostimulation were used to search ALOIS on 6 December 2011. The studies were identified from the following databases:

1. Healthcare databases: Medline, Embase, Cinahl, Psycinfo and Lilacs
2. Trial registers: meta Register of Controlled Trials; Umin Japan Trial Register; WHO portal (which covers ClinicalTrials.gov; ISRCTN; Chinese Clinical Trials Register; German Clinical Trials Register; Iranian Registry of Clinical Trials and the Netherlands National Trials Register, plus others)
3. *The Cochrane Library*'s Central Register of Controlled Trials (CENTRAL)
4. Number of grey literature sources: ISI Web of Knowledge Conference Proceedings; Index to Theses; Australasian Digital Theses

A total of 670 references were retrieved from the December 2011 search. After de-duplication and a first-assessment, authors were left with 94 references to further assess for inclusion, exclusion or discarding.

2.2. Inclusion criteria

2.2.1. Studies

RCTs examining the effect of cognitive stimulation for dementia were initially included if they had been published in English in a peer-reviewed journal. Authors were contacted for missing data, such as details of randomisation, means, and standard deviations.

2.2.2. Participants

Participants who had a diagnosis of dementia (Alzheimer's disease, vascular dementia mixed Alzheimer's and vascular dementia, other types of dementia), including all levels of cognitive impairment. The participants could receive the intervention in a variety of settings (own home, out-patient, day care, residential setting).

2.2.3. Interventions

Participants attended regular therapy sessions (involving a group or family caregiver) for a minimum period of 4 weeks. The intervention needed to meet the definition of cognitive stimulation described above (Clare and Woods, 2004), targeting cognitive and social functioning. The approach might also be described as RO groups, sessions or classes. Some studies, which described their intervention as 'cognitive stimulation' did not meet our operational definition, typically as they involved repeated training on specific cognitive tasks. The intervention needed to be compared to 'no treatment', 'standard treatment', or placebo.

Outcome measures were required to evaluate performance on at least one cognitive measure for the participant and could also include the assessment of any of the following variables: mood, quality of life, well being, activities of daily living, communication, behaviour, neuropsychiatric symptoms and social interaction.

2.3. Data extraction

Descriptive characteristics (such as quality of randomisation and blinding) and study results were extracted, recorded and entered into RevMan 5.1 (Updated Software 2011). Additionally, letters and e-mails were sent to some authors of controlled trials asking for essential and additional information (statistics, sources of bias, details of randomisation). The summary statistics required for each trial and each outcome for continuous data were the mean change from baseline, the standard error of the mean change, and the number of patients for each treatment group at each assessment. Where changes from baseline were not reported, the reviewers extracted the mean, standard deviation and the number of patients for each treatment group at each time point if available. The reviewers calculated the required summary statistics from the baseline and assessment time treatment group means and standard deviations, assuming in this case a zero correlation between the measurements at baseline and assessment time. This conservative approach to estimation of the variance of change scores was chosen, as it is preferable in a meta-analysis. The baseline assessment was defined as the latest available assessment prior to randomisation, but no longer than two months prior. For each outcome measure, data were sought on every patient randomised. To allow an intention-to-treat analysis, the data were sought irrespective of compliance, whether or not the patient was subsequently deemed ineligible, or otherwise excluded from treatment or follow-up. Discussion between the two reviewers (EA, BW) and the other authors was used to resolve any queries.

2.4. Analyses

RevMan 5.1 (Updated Software, 2011) was used. The meta-analyses presented overall estimates of the treatment difference from a fixed-effect model and a test for heterogeneity was performed using a standard Chi square statistic. Where there was evidence of heterogeneity of the treatment effect between trials then a random-effects model was utilised (which results in broader confidence intervals than for those of a fixed-effect model). Because trials used different tests to measure the same outcomes, the measure of the treatment difference for any outcome that we used was the weighted mean difference, when the pooled trials used the same rating scale or test, and the standardised mean difference (the absolute mean difference divided by the standard deviation) when different rating scales or tests were used. A weighted estimate of the typical treatment effect across trials was calculated. The reviewers achieved consensus on the interpretation of the