An evidence-based systematic review on cognitive interventions for individuals with dementia

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CRD summary
The review concluded that research evidence to support the use of cognitive interventions for individuals with dementia is accumulating. This conclusion reflects the limited evidence presented, however, some relevant studies may have been missed.

Authors' objectives
To assess the evidence on cognitive interventions for patients with Alzheimer's disease or related dementias.

Searching
The authors searched 27 electronic databases; a list of databases and search terms were available from the authors upon request. Reference lists of all full text articles obtained were screened for additional relevant studies. Only studies published in English in peer-reviewed journals between January 2002 and January 2011 were eligible for inclusion.

Study selection
Eligible for inclusion were experimental or quasi-experimental studies, with a control group, that involved cognitive interventions for adults with dementia. Studies of patients with semantic dementia, HIV-related dementia or mild cognitive impairment were excluded. Studies of mixed populations, such as dementia and stroke, were eligible if data could be separated for analysis. Studies where the cognitive intervention was delivered as part of an interdisciplinary rehabilitation program, or was an indirect intervention, and studies of cognitive stimulation or psychosocial treatments were excluded.

Most included participants were diagnosed with Alzheimer's disease, or probable Alzheimer's disease based primarily on the American Psychiatric Association's criteria for dementia of the Alzheimer's type or the National Institute of Neurological and the Communicative Disorders and Stroke-Alzheimer's Disease and Related Disorders Association (NINCDS-ADRDA) criteria. Other diagnoses were mixed dementia, vascular dementia, senile dementia or dementia not otherwise specified. Most patients were mildly impaired or in the early stages of cognitive decline, few were moderately or severely cognitively impaired. Most participants were female and most studies were conducted in the United States. Interventions included errorless learning, spaced-retrieval training, a specific verbal instruction strategy, vanishing cues, memory books and Montessori-based treatments.

Two reviewers independently assessed studies for inclusion in the review.

Assessment of study quality
Quality of included studies was assessed using a tool developed by the American Speech-Language-Hearing Association (ASHA). The tool included questions related to protocol description, participant comparability/description, blinding, allocation, treatment fidelity, significance, precision and intention-to-treat analysis.

Two reviewers independently assessed study quality. Any disagreements between reviewers were resolved via consensus and results of quality assessment were vetted by all authors.

Data extraction
Two reviewers independently extracted data on outcomes related to impairment and activity limitations/participation restrictions. Data extraction was vetted by all authors.

Methods of synthesis
Two clinical questions were addressed, one related to the effect of cognitive interventions on measures of cognitive communication impairment, and one related to the effect of cognitive interventions on measures of cognitive-communication activity limitations/participation restrictions. A narrative synthesis was presented.
Results of the review
Forty-three studies were included in the review (556 participants); seven before and after studies, one post-test only comparison study, 18 quasi-experimental studies and 17 multiple-baseline designs. Most studies included adequate protocol and participant descriptions, however adherence to intervention protocols, blinding and randomisation procedures were poorly reported. Most participants were recruited through convenience sampling.

Cognitive-communication impairment (26 studies):
Ten studies compared errorless learning with errorful/trial-and-error interventions in which error responses were not constrained. Three studies reported a statistically significant difference in recall performance/task performance; outcomes were generally positive in the remaining studies, but few studies reported effect size data. When errorless learning was compared to a modified intervention approach, another single approach (vanishing cues) or a mixed approach, outcomes were variable.

Nine studies assessed different variations of spaced-retrieval training with some positive findings, but few studies reported effect size data.

One study each assessed a Montessori-based intervention, an electronic memory aid, a problem solving strategy, a specific rehearsal strategy and mixed interventions with varying results; some of the studies had very small sample sizes.

Cognitive-communication activity limitations/participation restrictions (21 studies):
Eleven small studies assessed a verbal instruction strategy which found statistically significant improved performance compared to baseline.

Seven studies assessed spaced-retrieval training, either alone or in combination with other approaches; outcomes were generally positive.

Three studies assessed other interventions with varying results.

Authors' conclusions
Research evidence to support the use of cognitive interventions for individuals with dementia is accumulating.

CRD commentary
The review question and inclusion criteria were clear. The search strategy appeared extensive, but details were not reported. Only studies published in English in peer-reviewed journals were included in the review, this increased potential for publication bias and language bias; relevant studies may have been missed. Study selection, data extraction and quality assessment were all carried out with sufficient attempts to minimise reviewer error and bias. The quality assessment criteria appear to have been appropriate. In view of study heterogeneity, the narrative synthesis was appropriate. The authors acknowledge the limited nature of the evidence base and the very small sample size of some of the included studies. The authors' conclusion reflects the evidence presented and is probably reliable; however, limitations in the evidence base and the potential for missed studies should not be overlooked.

Implications of the review for practice and research
Practice: The authors stated that individuals with dementia and mild or mild-moderate to moderate cognitive decline may be able to learn and relearn facts and procedures using specific cognitive intervention strategies. Spaced-retrieval training was a promising technique to facilitate recall of facts and procedures. Intervention tasks should be functional and include ecologically valid facts and procedures. Clinicians should consider ethnic, cultural, linguistic and educational factors when making prognostic statements about learning outcomes.

Research: The authors stated that further studies were required on the cognitive intervention techniques that have not been studied extensively (such as interventions other than spaced-retrieval training). They stated that future studies should include participants from different racial/ethnic, cultural and educational backgrounds and provide detailed descriptions of participant characteristics. In addition, future studies should measure retention or maintenance of treatment gains and have comparable outcome measures.
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