Cognitive leisure activities and their role in preventing dementia: a systematic review

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CRD summary
The authors concluded that there was some evidence that participation in cognitive leisure activities in mid or late life might prevent dementia, although they stated that this conclusion should be treated with caution. Due to the reliance on methodologically weaker study designs and uncertainties in the review process, the extent to which this conclusion is reliable is unclear.

Authors' objectives
To evaluate the role of cognitive leisure activities in preventing dementia in older adults.

Searching
Seventeen databases (listed in the paper) were searched for all published and unpublished studies written in English to September 2008. Search terms were reported. Reference lists of retrieved papers were scanned to locate additional studies.

Study selection
All published studies of cognitive leisure activities (that involve information processing/mental response as a key component) in adults aged 60 years and older living in the community or residential care setting with or without a clinical diagnosis of dementia were eligible for inclusion in the review. The eligible outcome was presence or absence of dementia, measured by cognitive function tests, mental examination scores, Diagnostic and Statistical Manual (DSM) of Mental Disorders classification or other valid diagnostic tool for dementia.

Included were studies conducted in USA, China, Japan, Sweden and elsewhere in Europe. Studies varied considerably in terms of the interventions (listed in the paper), population, stage of life when participation was measured and measurement techniques. Many intervention groups received multiple components of physical, social and recreational activities. Control groups comprised healthy individuals, neighbours and friends.

The authors did not explicitly state how many reviewers selected the studies.

Assessment of study quality
Study quality was assessed using the Joanna Briggs Institute critical appraisal instrument for sample characteristics, selection bias, confounding factors, outcome measurement, follow-up, withdrawals and statistical analysis. The maximum achievable score was 9.

Two independent reviewers carried out the quality assessment.

Data extraction
Data were extracted to enable presentation of odds ratios (OR), relative risks (RR) and hazard ratios (HR), along with 95% confidence intervals (CI). Authors were contacted for further information, where necessary.

The authors did not state how many reviewers carried out data extraction.

Methods of synthesis
Studies were combined in a narrative synthesis. Studies were grouped in terms of cognitive leisure activity participation in early and middle adulthood, and participation in later adulthood.

Results of the review
Thirteen studies were included in the review (sample size ranged from 60 to 5,055). There were eight cohort studies and
five case-control studies. All studies satisfied at least half of the criteria for methodological quality. Follow-up (where reported) appeared to be conducted for up to 10 years. Some studies adjusted for confounding.

Five studies showed positive associations between participation in cognitive leisure activities in early and middle adulthood and reduced risk of Alzheimer's Disease and other dementias. In particular, significant positive associations were noted between novelty-seeking activity such as learning a new skill or taking up a new hobby (OR 0.248, 97.5% CI, 0.139 to 0.443; one study), daily intellectual activity, such as completing jigsaws or crosswords (OR 0.84, 95% CI 0.72 to 0.98; one study) and decreased odds of developing Alzheimer's disease. Women were more likely than men to reduce their risk of Alzheimer's Disease after participating in intellectual-cultural activities (OR 0.42, 95% CI 0.18 to 1.00; one study). The absence of reading, writing and entertainment were all associated with significantly increased risks of Alzheimer's Disease (two studies). A sixth study showed that television watching as an individual activity was associated with a significantly increased risk of developing Alzheimer's Disease (OR 1.32, 95% CI 1.08 to 1.62; one study).

Six out of seven studies revealed a positive association between participation in a variety of cognitive leisure activities in later adulthood in terms of reduced risk for Alzheimer's Disease and other dementias. One study found a significant association between reading and reduced risk of dementia (OR 0.49, 95% CI 0.35 to 0.68). Another study found that participating in three activities (including reading and television watching) was significantly more effective (RR 0.41, 95% CI 0.18 to 0.90) than two in terms of lower risk for dementia.

**Authors’ conclusions**
There was some evidence that participation in cognitive leisure activities in mid or late life might prevent dementia, although this conclusion should be treated with caution.

**CRD commentary**
The review addressed a clear research question and presented potentially reproducible inclusion criteria. A number of relevant databases were searched and attempts were made to minimise publication bias in the search strategy. Language bias was a potential threat and the inclusion of only published studies in the analysis meant that relevant studies might have been missed. An appropriate quality assessment tool was used; the authors reported that quality was variable. Although the quality assessment process was conducted with sufficient efforts to minimise error and bias, the same could not be assumed for study selection and data extraction. The method of synthesis was appropriate given the wide variation in study characteristics. Inclusion of studies that investigated activities in addition to cognitive leisure was unclear in terms of the overall impact on review findings.

The authors’ cautious conclusion reflected the limited evidence presented, but due to the reliance on methodologically weaker study designs and uncertainties in the review process, the extent to which this conclusion is reliable is unclear.

**Implications of the review for practice and research**
**Practice:** The authors stated that selected cognitive leisure activities (such as reading) might offer more benefit than others in protecting against dementia.

**Research:** The authors stated that high-quality randomised controlled trials (with appropriate sample size and follow-up) were needed to evaluate a causal relationship between cognitive leisure activities and the risk of dementia. Standardisation of cognitive leisure classification was needed, along with specific research into the effects of different modes, frequencies and intensities of activity and past participation patterns.

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