


Strategies to improve dental health in elderly patients with cognitive impairment

A systematic review

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Aging is a natural and irreversible process of life, yet people are living longer than ever before. The extension of the human life span is increasing the elderly world population, which is projected to be more than 2 billion by the year 2050.¹ Aging often is accompanied by an assortment of dental health-related problems; among them are caries, periodontal disease, and edentulism.

Poor oral health in elderly people is associated with low self-esteem, decreased social interactions, malnutrition, dysphagia, and aspiration pneumonia.^{2,3} These problems greatly contribute to patients' failure to thrive, affecting their daily lives and those of their families and caregivers.⁴⁻⁶ Several oral health prevention programs and interventional strategies have had fair to good success at improving the oral health and oral health-related quality of life in elderly people.⁷⁻¹² As a result, geriatric oral health has improved in the past 30 years, with the elderly having less untreated caries and retaining more natural teeth.¹³ Good oral health may be an important factor in maintaining

 Supplemental material is available online.

ABSTRACT

Background. Cognitive impairment is the gradual loss of one's ability to learn, remember, pay attention, and make decisions. Cognitively impaired elderly people are a challenging patient population for dental health care professionals and may be at higher risk of developing oral health diseases. The authors systematically reviewed interventions effective at improving dental health in patients with cognitive impairment and described research gaps remaining.

Types of Studies Reviewed. In a comprehensive search of multiple databases, the authors identified 2,255 studies published in the English language from 1995 through March 2016. The authors included studies if the investigators evaluated oral health measures after an intervention in patients 65 years or older with cognitive impairment or dementia. Nine full-text articles met the criteria for inclusion.

Results. Only 1 study was a randomized control trial, whereas all others lacked appropriate controls. Investigators studied the effects of dental treatments, battery-powered devices for oral hygiene, and training of care staff members. Most interventions improved some aspect of the oral health of patients with dementia, and results were more pronounced when patients required assistance while performing oral hygiene tasks or had poor oral health at baseline.

Conclusions and Practical Implications. A basic care plan for patients with dementia should, at the minimum, match prevention strategies recommended for healthy elderly patients. Dental health care professionals should promote oral hygiene education for caregivers for elderly patients with cognitive impairment. There is a wide gap in knowledge regarding effective methods specifically to improve oral health in patients with dementia.

Key Words. Cognitive impairment; dementia; Alzheimer disease; oral health; dental care.

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a good quality of life; therefore, dental health care professionals should be prepared to provide adequate dental treatment to elderly patients with chronic diseases and conditions.

Cognitive impairment mostly affects elderly people, and the prevalence of dementia increases exponentially with age; it is also a leading cause of disability and dependence.¹⁴ Results from some studies suggest that elderly patients with dementia may have worse oral health than do cognitively healthy control patients, further widening the divide of quality of life. Investigators in several studies independently found that elderly patients with cognitive impairment were more likely to have fewer remaining natural teeth.¹⁵⁻¹⁸ Investigators in other studies have shown that patients with dementia are more likely to have periodontal disease than are control patients without dementia.^{19,20} Furthermore, study results have shown that patients with dementia have higher numbers of coronal and root caries.²¹⁻²⁴ Not all dental health parameters seem to be worse in patients with dementia compared with that in healthy control patients, however, because investigators in some studies have found no association between poor oral health and cognitive impairment.^{21,25-28}

Although the link between cognitive impairment and poor oral health is not well established, this is still a challenging population for dentists.^{2,29-36} Patients with cognitive impairment have learning disabilities, memory problems, attention deficits, and difficulty in decision making, all mental tasks necessary to maintain good oral health habits. Oral hygiene is difficult for these patients; they lose interest in brushing and flossing their teeth and may find dental care visits confusing and even frightening.^{37,38} In addition, patients with cognitive impairment may not be able to communicate their dental problems, requiring health care professionals to use special strategies to reveal and treat them.³⁹ Health care professionals will need access to special dental health care programs and tailored treatments to accommodate the mental disabilities of patients with cognitive impairment and dementia.

Evidence-based dentistry emphasizes reviewing and critically appraising the research literature to improve clinical decision making. The rationale for this systematic review is that by reviewing interventions to improve oral health in elderly patients with cognitive impairment, research projects and patient programs may be developed to improve oral health in this growing vulnerable sector of the population. Thus, our main question is this: which interventions have been proved effective to maintain good oral health in patients with cognitive decline?

METHODS

Inclusion and exclusion criteria. We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement as a guideline for writing this

systematic review.⁴⁰ To address our question, criteria for inclusion in the systematic review were as follows: studies had to include elderly people (65 years or older) with cognitive impairment or dementia (whenever specified by the article, dementia of subtypes specified by the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*⁴¹—for example, dementia not due to delirium, schizophrenia, psychosis, major depressive disorder, mental retardation, epilepsy) as participants; study investigators had to measure oral health parameters (for example, caries, missing teeth, edentulism, periodontal disease, oral hygiene habits) as an outcome; and study authors had to investigate the effect of an oral health intervention (for example, education, use of battery-powered toothbrush). Criteria for exclusion from the systematic review were studies that were not research articles (for example, commentaries, editorials, reviews, case studies), nonhuman studies, studies in a language other than English, studies published before 1995 (research regarding assessment of oral health in patients with dementia started in the middle to late 1990s),² and intervention studies that did not address oral health (for example, clinical studies for drugs to treat Alzheimer disease).

Search strategy, information sources, study selection, and data collection process. We searched PubMed, Embase, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) database (1995 through March 2016) by using terms related to oral health and cognitive impairment ([Appendix](#), available online at the end of this article). We also conducted a manual search from the reference lists of relevant review articles. The first author (N.S.R.) performed the eligibility assessment in an unblinded, standardized manner ([Figure](#)). We screened titles and abstracts to discard articles that were unrelated to the question, did not address both oral health and cognitive impairment in elderly people, were duplicates, were not research articles, or were interventional studies unrelated to oral health and cognitive impairment. Next, 2 authors (N.S.R., C.B.J.) assessed full-text articles for eligibility. We excluded studies if they had data on only oral health parameters outside the scope of this review (chewing problems, swallowing problems, salivary problems, dry mouth, oral fungal infections, oral flora) or data were unclear, missing, or evaluated for groups other than cognitive impairment and oral health ([eTable](#), available online at the end of this article). During the review process, we noted all reasons for exclusion, and we discussed uncertainties among all of us until we reached consensus for inclusion or exclusion. We extracted data of interest from each eligible study through a template form.

ABBREVIATION KEY. CINAHL: Cumulative Index to Nursing and Allied Health Literature. NR: Not reported.

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