

Behavioral Interventions for Oral Care in Cognitively Impaired Older Adults.

Abstract

Cognitive impairment, including dementia and Alzheimer's disease, compromises older adults' ability to maintain oral hygiene, leading to increased dental plaque, periodontal disease, and tooth loss. Care-resistant behaviors during oral care present significant barriers to effective hygiene maintenance. This narrative review evaluates behavioral interventions designed to improve oral care practices among cognitively impaired older adults. A comprehensive search of electronic databases including PubMed, Embase, CINAHL, and Cochrane Library was conducted to identify studies examining nonpharmacological behavioral interventions for oral care in dementia. The Threat Perception Theory provides a neurobiological framework for understanding care-resistant behaviors as defensive fear responses rather than intentional aggression. The Managing Oral Hygiene Using Threat Reduction (MOUTH) intervention has demonstrated efficacy in improving mouth care completion in nursing home residents. Major behavioral strategies encompass adaptive communication, individualized behavioral support using frameworks such as DICE, environmental modification, attention-shifting techniques, and structured caregiver-supported protocols. Implementation is hindered by progressive cognitive decline, staffing shortages, high caregiver turnover, and inadequate reimbursement for behavioral oral care. Person-centered behavioral interventions show promise for improving oral care in cognitively impaired older adults. However, the current evidence base is limited by small sample sizes, methodological heterogeneity, and lack of standardized protocols. Future research should prioritize large-scale randomized controlled trials, technology-assisted

interventions, and community-based caregiver training programs to establish evidence-based clinical guidelines.

Keywords: Dementia; Alzheimer's disease; Oral hygiene; Behavioral interventions; Care-resistant behaviors; Threat perception; MOUTH intervention; Caregivers; Nursing homes; Geriatric dentistry; Person-centered care; Nonpharmacological management

1. Introduction

Over recent years, the prevalence of cognitive impairment in older adults, including dementia and Alzheimer's disease, has increased. Cognitive impairment refers to a gradual reduction in cognitive abilities, including learning, memory, attention, and making decisions, which can compromise the affected individual's daily functions. Among geriatric patients with cognitive impairment, factors such as less frequent toothbrushing, delayed dental appointments and tooth loss are common clinical observations. Maintaining dental hygiene practices among such patients has been quite challenging, which tends to limit the implementation of oral hygiene interventions.^{1, 2}

Cognitively impaired patients continue to encounter challenges in maintaining their oral hygiene practices, which may involve impaired memory, limitations in performing oral hygiene practices, lack of participation and motivation towards oral health. Barriers to oral hygiene practice are also associated with emotional and psychological issues encountered by this population. Furthermore, this population may experience communication issues, which complicate oral hygiene practices. These challenges signify the importance of effective strategies and interventions to improve their daily care and clinical outcomes among such a population.¹⁻³

Consequently, oral health providers are required to improve their diagnostic and management strategies to effectively meet the needs of cognitively impaired patients. This has highlighted the importance of providing a comprehensive approach for the cognitively impaired elderly population. This includes organizing training programs, providing assistance with toothbrushing, maintaining oral hygiene daily routines and early diagnostic tools to assess oral health along with oral hygiene preventive management. Caregiver involvement tends to support the maintenance of oral hygiene practices in cognitively impaired patients.^{1,4}

Thus, behavioural intervention plays a significant role in improving routine oral care and overall health among the cognitively impaired elderly population. Therefore, this review aims to evaluate the behavioural interventions that help in improving oral hygiene practices among cognitively impaired patients.¹⁻³

2. Methods

This narrative review was conducted by searching electronic databases including PubMed, Embase, CINAHL, PsycINFO, and Cochrane Library for peer-reviewed articles published in English from inception to August 2026. Search terms combined Medical Subject Headings (MeSH) and keywords related to dementia, cognitive impairment, oral health, oral hygiene, behavioral interventions, and care-resistant behaviors. Inclusion criteria encompassed original research articles, systematic reviews, and randomized controlled trials examining nonpharmacological behavioral strategies to improve oral care in older adults with dementia or cognitive impairment. Studies focusing exclusively on pharmacological management or conducted in populations without cognitive

impairment were excluded. Data were extracted on study design, sample characteristics, intervention components, outcome measures, and key findings. The quality of evidence was assessed narratively, with priority given to randomized controlled trials and systematic reviews.

3. Threat Perception and Behavioral Response

Maintaining proper oral hygiene in older adults with dementia remains one of the greatest hurdles in geriatric dentistry. As cognitive impairment progresses, many individuals become increasingly dependent on caregivers for routine oral care while displaying behaviours such as refusing to open the mouth, clenching the jaw, pushing caregivers away and biting during oral hygiene procedures. Previously, these behaviours were frequently translated as aggression or non-compliance. However, more recent evidence suggests that they are more adequately described as care-resistant behaviours (CRBs) originating from altered threat perception instead of intentional refusal of care.⁵

Jablonski and colleagues principally changed the understanding of these behaviours by suggesting the Threat Perception Theory, which proposes that neurodegenerative changes affecting higher cortical function reduce an individual's capability to accurately interpret the intentions of others, due to which, routine oral hygiene procedures may be perceived as threatening. This is because caregivers enter intimate personal space and introduce unfamiliar objects close to the face and oral cavity. This perceived threat activates primitive defensive

pathways, producing instinctive fight-or-flight responses manifested as head turning, mouth clenching, grabbing, shouting, or biting.⁵ Rather than representing behavioural disturbances alone, these responses may therefore reflect preserved survival mechanisms occurring in the context of impaired cognitive interpretation.

Recognition of this mechanism led to the development of the Managing Oral Hygiene Using Threat Reduction (MOUTH) intervention, which combines conventional oral hygiene techniques with behavioural strategies designed to minimise perceived threat.⁶ The intervention stresses on calm verbal communication, approaching the patient from the front, maintaining eye contact, introducing oneself before treatment, explaining each step, using simple one-step instructions, encouraging patient participation whenever possible, and temporarily withdrawing when distress increases. These approaches indicate that changing caregiver behaviour may be more effective than attempting to control patient behaviour directly.

Early clinical evaluation of the MOUTH intervention displayed promising results. In a pilot study involving nursing-home residents with moderate-to-severe dementia, Jablonski et al. observed improvements in oral hygiene together with reductions in care-resistant behaviours following implementation of threat-reduction techniques.⁷ Even though the small sample size limited statistical power, the findings established the feasibility of behavioural interventions during daily oral care and provided the foundation for greater clinical investigations.

112 Subsequent evidence from a randomized clinical trial further supported this
113 approach. Residents receiving structured threat-reduction strategies achieved
114 better oral-health outcomes and caregivers were more frequently able to complete
115 oral hygiene procedures successfully compared with those receiving routine care.⁸
116 Nevertheless, the investigators also noted considerable variability in behavioural
117 responses between individuals, indicating that threat perception represents only
118 one component of a multifactorial process. Pain, oral discomfort, environmental
119 noise, unfamiliar caregivers, communication deficits, fatigue, and progression of
120 dementia may each contribute to care resistance and should therefore be
121 considered during patient assessment.⁸ This finding highlights the importance of
122 individualized rather than protocol-driven management.

123 Broader reviews of oral healthcare in dementia reinforce these observations.
124 Chalmers and Pearson emphasized that declining cognition, reduced manual
125 dexterity, medication-related xerostomia, impaired communication, and increasing
126 dependence collectively predispose individuals with dementia to deteriorating oral
127 health.⁹ They argued that caregiver education, preventive oral-health programmes,
128 and individualized communication strategies should be regarded as integral
129 components of oral disease prevention rather than supplementary interventions.
130 Importantly, their review recognized that behavioural management must

131 accompany technical oral hygiene procedures if satisfactory long-term outcomes
132 are to be achieved.

133 Evidence synthesized by Hoben and colleagues similarly identified behavioural
134 approaches as essential components of successful oral healthcare in long-term care
135 facilities.¹⁰ Across the available studies, interventions including verbal cueing,
136 demonstration, positive reinforcement, familiar routines, task simplification, and
137 preservation of patient autonomy consistently improved cooperation during oral
138 hygiene, although the quality of supporting evidence varied considerably. The
139 authors also highlighted the lack of standardized intervention protocols and
140 emphasized the need for well-designed randomized controlled trials evaluating
141 clinically meaningful oral-health outcomes.

142 The importance of caregiver education has also been demonstrated in nursing-home
143 intervention studies. Zimmerman and colleagues reported that structured staff training
144 programmes emphasizing person-centred communication and behavioural
145 management improved oral-care practices and reduced conflict during assisted mouth
146 care.¹¹ Rather than encouraging completion of oral hygiene through persistence or
147 restraint, these programmes promoted understanding resistant behaviours as
148 meaningful expressions of distress, thereby supporting more respectful and effective
149 care delivery.

150 Collectively, the available literature supports a conceptual shift in the management
151 of oral care among cognitively impaired older adults. Care-resistant behaviours

should not be viewed simply as disruptive symptoms but as complex behavioural responses influenced by neurodegeneration, communication difficulties, environmental factors, oral discomfort, and caregiver interaction.⁵⁻¹¹ Although the Threat Perception Theory provides a robust neurobiological explanation for many defensive behaviours, current evidence suggests that successful management requires a comprehensive, person-centred approach incorporating behavioural communication techniques, individualized assessment, caregiver education, and appropriate clinical management of pain and oral disease. Future research should focus on larger multicentre trials with standardized behavioural outcome measures to establish evidence-based clinical guidelines for oral healthcare in this vulnerable population.

4. Major Behavioral Interventions

Behavioral interventions in older adults with cognitive impairment should be considered an adaptive process. Cognitive decline can alter how individuals perceive communication, physical contact, environmental stimuli, and unfamiliar procedures. Therefore, behavioral approaches should focus on improving the interaction between the patient, caregiver, and care environment to make care more effective, understandable, and tolerable.^{12, 13}

Adaptive Communication

Communication should be adapted to the patient's ability to receive, understand, and respond to information. Lengthy explanations and multiple instructions provided simultaneously may exceed the information-processing capacity of individuals with

cognitive impairment. Short explanations, breaking activities into smaller steps, allowing adequate time for responses, and using demonstrations or visual cues may facilitate patient participation in care.^{12, 13}

The manner in which information is delivered is equally important. Consistent, calm, and supportive communication may help prevent uncertainty from progressing into anxiety or distress. When patient cooperation decreases, repeatedly insisting on completing an action may increase resistance. More effective approaches may include modifying the wording of a request, briefly pausing the activity, redirecting attention, or returning to the procedure at a more appropriate time. In dental practice, this flexible communication style allows dentists and dental hygienists to recognize changes in the patient's tolerance rather than expecting continuous cooperation throughout the appointment.

Several established behavioral techniques can be adapted to the dental setting. Tell-Show-Do uses simple verbal explanation, nonthreatening demonstration, and gradual completion of the procedure to improve predictability and understanding. Visual supports, photographs, or simple visual schedules may also help patients understand what to expect during a dental visit.

Individualized Behavioral Support

The same behavior may have different underlying causes among different patients. Refusal to open the mouth, turning the head away, or attempting to withdraw from a caregiver may be associated with fear, pain, fatigue, confusion, or an attempt to maintain control over the situation. Therefore, behavioral support should begin with identifying the circumstances contributing to the response rather than immediately attempting to suppress the behavior.^{12,14}

197 A structured framework such as the Describe, Investigate, Create, and Evaluate (DICE)
198 approach may support this individualized process. The clinician first describes the
199 behavior and its context, investigates possible contributing factors such as pain,
200 fatigue, sensory impairment, medication effects, or environmental stressors, creates a
201 personalized nonpharmacologic plan, and evaluates the patient's response. In dental
202 care, this framework may help identify why a patient resists a procedure and guide
203 appropriate modification of communication, the environment, or the treatment
204 sequence.^{12, 13}

205 Following this assessment, interventions can be adapted according to the patient's
206 individual abilities, daily routines, preferences, and known sources of stress. Familiar
207 procedures and consistency become increasingly important as cognitive impairment
208 progresses and adaptation to new situations becomes more difficult.

209 Research in dementia care indicates that interventions tailored to personal
210 interests and preferences may lead to a slight improvement in agitation specifically,
211 although evidence for other behavioral symptoms remains limited, with low overall
212 certainty.¹⁵ These findings emphasize the importance of individualized approaches
213 and demonstrate that no single behavioral strategy is effective for every patient.

214 Environmental Modification

215 Patient behavior may also be influenced by the conditions in which care is provided.
216 Environments containing numerous unfamiliar stimuli may increase cognitive
217 demands for individuals who already have limited ability to process new

218 information. Environmental modification therefore aims to identify and eliminate
219 factors that may contribute to stress or discomfort.^{12,14}

220 This principle is particularly relevant in dentistry, where treatment may involve bright
221 lighting, equipment noise, unfamiliar instruments, close physical contact, and
222 unexpected oral sensations. Reducing unnecessary stimuli, minimizing waiting time,
223 and maintaining consistency in staff members or familiar routines may improve
224 tolerance of dental appointments. Appointment timing may also be individualized, for
225 example, scheduling visits during periods when the patient is typically more alert and
226 able to cooperate.

227 Sensory interventions may provide additional support for some patients. Calming or
228 familiar music and other individually selected sensory approaches have been
229 studied as nonpharmacologic methods for reducing agitation and anxiety in
230 dementia; however, effectiveness varies among patients and interventions.¹⁶ Gentle
231 touch or hand massage may also have a calming effect for some individuals when
232 physical contact is well tolerated. Therefore, sensory approaches in dental practice
233 should be guided by individual patient responses rather than applied as a universal
234 strategy.

235 Attention Shifting and Gradual Familiarization

236 When anxiety begins to interfere with care, attention-shifting strategies may help
237 prevent escalation of negative behavioral responses. Conversation about familiar topics
238 or the use of preferred sensory stimuli may create an opportunity to continue care in a
239 less stressful environment. Reminiscence-based approaches, such as discussing

familiar people, places, or past experiences, may help establish rapport because long-term memories may remain accessible even as other cognitive abilities decline. Validation-based communication may also reduce distress by acknowledging the patient's emotional experience rather than repeatedly correcting or confronting the patient.

Some patients may also benefit from gradual familiarization with the dental environment. Rather than introducing an unfamiliar dental setting and a complex procedure simultaneously, patients can be gradually introduced to different elements of care: first becoming familiar with the dental professional and treatment room, followed by equipment exposure, and eventually more complex procedures. This approach allows treatment to be adapted according to the patient's abilities and tolerance.

Pre-visit preparation, including photographs of the dental environment, simple visual schedules, or practicing specific actions such as opening the mouth at home, may further reduce uncertainty and facilitate participation in care.

Caregiver-Supported Interventions

Caregivers possess valuable information that may not always be obtained during a clinical assessment alone. Knowledge of the patient's routines, preferred communication methods, previous reactions to treatment, and early signs of anxiety can help the dental team anticipate and prevent potential challenges. Therefore, caregiver involvement extends beyond physical assistance and becomes an important component of developing an individualized behavioral approach.¹⁷

This role is particularly important in daily oral hygiene, as the ability to independently perform oral care gradually declines. Effective caregiver support should include not only

general oral health education but also practical strategies for initiating oral care, responding to resistance, modifying the sequence of tasks, and recognizing situations in which an intervention may increase patient stress or discomfort.

Structured mouth-care protocols may provide additional support for patients who demonstrate care-resistant behavior during oral hygiene. These approaches typically combine simple step-by-step guidance, gentle communication, demonstration, environmental modification, and individualized responses to signs of distress or resistance.⁷ Rather than forcing completion of oral care, caregivers may need to modify the sequence of tasks, redirect attention, or attempt care again when the patient is more receptive.

Overall, major behavioral interventions for older adults with cognitive impairment are based on a central principle: the care system should adapt to the patient's abilities rather than requiring the patient to adapt to a fixed care routine. In dentistry, combining adaptive communication, individualized assessment, environmental modification, attention-shifting strategies, gradual familiarization, structured mouth-care approaches, and caregiver participation may help reduce stress, minimize resistance to care, and provide safer and more respectful treatment.

5. Barriers to Effective Implementation

Patient-Level Barriers: Care-Resistant Behaviours and Cognitive Decline ^{5,7}

The clinical implementation of behavioral oral care interventions is primarily hindered by patient-level effects of progressive cognitive decline. A principal barrier is care-resistant behaviour (CRB), which manifests as an automatic, fear-based response triggered when

a patient's compromised cognitive processing misinterprets an invasive tool like a toothbrush as an imminent physical threat. As a result, routine hygiene procedures often provoke defensive actions, including mouth-clenching, head-turning, yelling, or physical aggression. In addition to behavioral resistance, progressive cognitive decline contributes to failure in task segmentation and orofacial motor function, causing patients to lose the ability to sequence self-care steps or to remember how to open and clear the oral cavity. Attempting to force care in these circumstances increases the risk of oral trauma and caregiver injury, and causes significant distress for the patient, which may intensify resistance in subsequent care episodes.

Caregiver-Level Barriers: Staffing Deficits and Turnover ^{5,19}

The operational context of long-term care facilities undermines the delivery of evidence-based behavioral interventions due to persistent staffing shortages and high employee turnover. Effective behavioral strategies require trust, patience, and consistency developed over time between care recipient and the care provider. However, chronic understaffing and frequent turnover result in a continual influx of unfamiliar caregivers, which significantly increases the likelihood of provoking defensive or combative responses in older adults with cognitive impairment. Additionally, high turnover erases institutional knowledge, as a departing care aide takes away their unique understanding of a specific patient's behavioral triggers and successful calming prompts, forcing replacement staff to restart the trust-building cycle from scratch.

Staffing and Knowledge-to-Practice Gaps ^{17,18}

A significant knowledge-to-practice gap persists among frontline caregivers and certified nursing assistants, who often lack standardized dental protocols and adequate training in geriatric oral hygiene within care facility curricula. Many caregivers begin their roles without the skills necessary to address the behavioral challenges associated

with dementia, including practical training in essential Behaviour Change Techniques (BCTs) such as task segmentation, bridging, and rescue techniques. Without training to recognize that cognitive decline impairs a patient's ability to follow complex commands, staff may frequently misinterpret an inability to cooperate as a stubborn, purposeful refusal. This misunderstanding frequently leads to premature abandonment of oral care, resulting in severe plaque accumulation, rapid periodontal breakdown, and systemic dental neglect.

Systemic, Institutional, and Financial Constraints ^{18,3}

At the macro level, facility design, financial policies, and fragmented interdisciplinary communication collectively marginalize oral health within the healthcare ecosystem. Long-term care facilities adhere to rigid, task-oriented schedules that prioritize mandatory medical duties and physical transfers relegating behavioral oral interventions to a low priority or omitting them entirely when time is limited. This institutional neglect is exacerbated by public insurance models like Medicaid, which provide insufficient reimbursement rates for geriatric dental care and fail to compensate professionals for the extensive time required to execute behavioral desensitization techniques. Additionally, the substantial logistical and financial burden of arranging specialized medical transportation for a frail, cognitively impaired older adult hinder access to regular preventive care, often delaying dental intervention until an acute, painful emergency occurs.

6. Gaps in the Evidence and Future Directions

Despite the growing recognition of oral health disparities in cognitively impaired older adults, substantial gaps persist in the evidence base supporting behavioral interventions. A systematic review of interventions for people with dementia or

cognitive impairment found that only two studies had been designed specifically for this population, and the overall methodological quality of included studies was poor.²⁰ Most investigations have been conducted in residential care settings, with virtually no population-based studies, limiting generalizability to community-dwelling individuals.²⁰ Furthermore, outcome measures have focused almost exclusively on proximal clinical indicators such as plaque and gingival indices, with limited assessment of patient-centered outcomes, quality of life, or sustained behavioral change.²⁰

The heterogeneity of intervention components and outcome metrics has precluded robust meta-analyses in many domains.²¹ While a recent meta-analysis of oral health interventions on cognition in dementia reported a weighted mean difference favoring intervention groups, only five studies were eligible, and two exhibited high risk of bias.²¹ The authors concluded that well-designed, high-quality clinical trials are urgently needed to investigate the effect of oral health interventions on both oral health conditions and cognition status.²¹

An overview of systematic reviews examining care worker-delivered oral health interventions in care homes identified that most reviews were rated critically low in quality, and the detail of interventions was poorly documented.²² Barriers such as time constraints, insufficient training, staff turnover, and resident resistance were frequently reported, yet few studies evaluated structured implementation strategies or long-term sustainability.²² Notably, most behavioral intervention research has concentrated on nursing home residents with moderate-to-severe dementia, leaving a critical gap regarding community-dwelling individuals with mild cognitive impairment or early-stage dementia.²³

Future research must prioritize large-scale, multicentre randomized controlled trials with standardized behavioral outcome measures and adequate follow-up periods.²⁰⁻²² Technology-assisted approaches, including smart electronic toothbrushes with behavioral monitoring and telehealth-supported caregiver coaching, represent promising avenues for community-based interventions.²³ Additionally, the development of culturally adapted, interdisciplinary care protocols that integrate dental professionals, nurses, and caregivers may enhance implementation fidelity and long-term sustainability. Future studies should also employ consistent frameworks such as the DICE model and standardized care-resistant behavior scales to enable cross-study comparisons and evidence synthesis.

7. Conclusion

Behavioral interventions represent a critical component of comprehensive oral care for cognitively impaired older adults. The reconceptualization of care-resistant behaviors through the Threat Perception Theory has shifted clinical practice from coercive approaches to person-centered, threat-reduction strategies that respect the neurobiological vulnerabilities of individuals with dementia.⁵⁻⁸ Evidence supports the efficacy of multifaceted interventions encompassing adaptive communication, environmental modification, individualized behavioral support, and structured caregiver training.⁹⁻¹⁷

Nevertheless, significant barriers at the patient, caregiver, and systemic levels continue to impede widespread implementation.^{18,19} Addressing these challenges requires more than isolated educational initiatives; it demands systemic reforms that prioritize oral health within long-term care policies, ensure adequate staffing ratios, and provide sustainable reimbursement for behavioral oral care.¹⁸⁻²²

Moving forward, clinicians and researchers must collaborate to develop standardized, evidence-based behavioral protocols that can be adapted to individual patient needs while maintaining fidelity to core intervention components. Only through rigorous, well-funded research and committed interdisciplinary partnerships can the oral health needs of this vulnerable population be met with the dignity and effectiveness they deserve.

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