

Structured Oral Care Education Management to Sustain Hygiene Performance and Oral Comfort in Institutionalized Older Adults

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Abstract: Oral health decline among institutionalised older adults is closely linked to caregiver-dependent hygiene practices and reflects the effectiveness of internal care management systems. This study examined the impact of structured oral care education management embedded within institutional policies, including standard operating procedures, supervision, and routine documentation, on caregiver performance and resident oral health outcomes. An explanatory sequential mixed-method design was conducted in a long-term care facility involving 40 caregivers and 72 older adults. A four-week structured education programme integrated with supervisory reinforcement and documentation protocols was implemented as part of routine care governance. Caregiver adherence to the complete oral care sequence increased from 61% to 89%, while omission frequency decreased from 29% to 7%. Mean plaque index declined from 2.8 to 1.4, heavy plaque presence from 36% to 8%, and mucosal irritation from 42% to 14%. Chewing confidence improved in 67% of residents. Improvements were sustained through the final observation period. These findings demonstrate that oral care education functions most effectively when institutionalised through internal policies, reinforcing its role as a management-driven strategy to sustain caregiver performance, oral comfort, and quality of life in long-term care settings.

Keywords: Institutional Policy; Oral Care Education Management; Caregiver Performance; Supervision and Documentation; Long-Term Care Facilities

A. Introduction

Declining oral health among institutionalised older adults has become increasingly recognised as a contributor to nutritional compromise, physical discomfort, and reduced daily functioning. Contemporary geriatric research positions oral deterioration not as an isolated dental issue, but as part of a broader trajectory of frailty that evolves alongside multimorbidity and functional dependency (Tennert et al., 2024). In residential care environments, chewing difficulty, denture instability, and xerostomia frequently coexist with polypharmacy and neuromuscular decline, gradually reshaping eating behaviour and tolerance to food textures (Viebranz et al., 2023).

Oral health-related quality of life among residents in long-term care facilities is consistently reported to be lower than that of community-dwelling older adults. This disparity reflects not only biological aging, but also environmental and organisational constraints that influence daily hygiene practices. Residents who depend on caregiver assistance for oral care tend to exhibit higher plaque accumulation, compromised denture hygiene, and persistent mucosal irritation when compared to peers who retain partial self-care ability (Asanza et al., 2025). The transition from autonomous oral hygiene to caregiver-mediated care therefore represents a critical point of vulnerability in geriatric health trajectories.

Institutional care environments rely on internal governance mechanisms to ensure consistent oral hygiene delivery, rather than depending solely on individual caregiver knowledge. Standard operating procedures, supervisory oversight, and routine documentation systems determine how oral care tasks are prioritised, executed, and evaluated across shifts. In the absence of formal policy structures, oral hygiene practices tend to rely on personal judgement, resulting in variability, procedural omission, and limited sustainability. Despite its clinical importance, oral care management remains underrepresented within institutional policy frameworks when compared to other routine nursing activities, revealing a critical gap between clinical need and organisational regulation.

Within this context, caregivers assume a decisive role in sustaining oral health and comfort. Evidence suggests that improvements in oral hygiene outcomes are more likely when caregivers receive structured education rather than relying on informal instruction or personal judgement (Tsakos et al., 2025). Educational approaches that include denture handling, mucosal inspection, and management of oral dryness have been associated with reductions in plaque indices and oral discomfort. These findings indicate that oral care education functions as an operational necessity in residential care rather than an optional skill enhancement.

Health service management literature further demonstrates that routine care activities achieve greater consistency when embedded within organisational systems. Studies examining workflow design, documentation practices, and supervisory structures show that compliance improves when tasks are sequenced, monitored, and reinforced through institutional cues (Andriani & Disman, 2023; Handayani et al., 2025). Similar mechanisms have been applied successfully in medication administration and nutritional monitoring, yet oral care tasks remain less frequently integrated into formal management frameworks. Despite growing recognition of its importance, oral care education in residential facilities is often delivered as a single or short-term intervention. Such approaches may increase caregiver confidence temporarily, but adherence tends to decline once reinforcement and supervision diminish (Schafthuizen et al., 2024). Reviews of caregiver training programmes indicate that while procedural knowledge can improve, long-term sustainability is limited when education is not aligned with organisational routines and accountability systems (Viebranz et al., 2023).

Barriers to consistent oral care delivery include time pressure, staffing constraints, limited oral health knowledge, and uncertainty when managing residents who resist care (Hoben et al., 2017; Weening-Verbree et al., 2021). These barriers are shaped not only by

individual capability, but also by managerial decisions regarding workload allocation, supervision, and feedback. Oral hygiene quality therefore reflects institutional governance as much as caregiver motivation (Perruchoud et al., 2022).

Although previous studies confirm that caregiver instruction can improve plaque control and denture hygiene, uncertainty remains regarding the durability of these gains when educational efforts are not reinforced through structured management processes (Chebib et al., 2025). Limited evidence is available on how educational reinforcement embedded within supervision and documentation systems influences both caregiver performance and resident quality-of-life outcomes over time.

Accordingly, this study examines how structured oral care education, reinforced through supervisory cueing, routine documentation, and scheduled refreshers, influences the continuity of caregiver performance and contributes to oral health outcomes and oral health-related quality of life among institutionalised older adults.

B. Methods

This study employed an explanatory sequential mixed-method design to examine how structured oral care education for caregivers influences resident oral health outcomes and the organisational conditions supporting sustained practice. The quantitative phase evaluated changes in clinical oral indicators following implementation of the educational programme. The qualitative phase subsequently explored caregiver and supervisory experiences to contextualise numerical changes within daily care management processes rather than interpreting outcomes as isolated clinical scores (Creswell & Plano Clark, 2018).

The research was conducted in a long-term residential care facility providing twenty-four-hour assistance to older adults with functional dependence in activities of daily living. In this setting, residents routinely receive support for denture insertion, plaque removal, and oral comfort management, making the facility appropriate for evaluating caregiver-driven oral hygiene systems in high-dependency environments. The quantitative phase included 72 institutionalised older adults and 40 caregivers who met predefined eligibility criteria and completed baseline and post-intervention assessments. Caregivers were eligible if they had provided direct daily care for a minimum of three months, as continuity in care relationships supports procedural retention and reduces anxiety during oral hygiene activities. Additional inclusion criteria required caregivers to be actively responsible for oral or denture care and willing to participate in training and evaluation procedures.

Residents were included if they required partial or full assistance with oral hygiene tasks due to oral frailty, physical limitation, or cognitive impairment common in sheltered elder environments. Residents with acute medical instability or those receiving palliative sedation were excluded to avoid additional burden and ensure assessment safety. The intervention consisted of a structured oral care education programme delivered over a four-week period. Educational content was developed based on current recommendations for oral hygiene in dependent older adults and evidence indicating that repeated, routine-linked instruction improves adherence and skill retention (Viebranz et al., 2023; Csikar et al., 2025).

Training focused on denture and natural tooth cleaning procedures, mucosal inspection, management of oral dryness, recognition of soft-tissue irritation, and adjustment of care approach when chewing discomfort was present. Instructional strategies combined brief didactic input, visual workflow mapping, hands-on demonstration using models, and supervised bedside practice. Educational materials were designed as procedural support tools rather than standalone teaching media. These materials functioned as cognitive cues to reinforce sequencing, pacing, and inspection routines during daily care delivery. Visual elements were used solely to guide internal training and were not intended as outcome measures or analytic components of the study.

A reinforcement session conducted in the fourth week focused on embedding learned skills into routine practice. This session reviewed documentation habits, shift communication, and allocation of time for oral care within existing workloads. Reinforcement was facilitated jointly by the trainer and unit supervisor to emphasise oral care as an organisational responsibility rather than an individual preference, thereby supporting intervention fidelity across shifts (Pombo Lopes et al., 2025). Clinical oral outcomes were assessed before and after the educational intervention. Plaque accumulation and mucosal condition were evaluated using the Oral Health Assessment Tool, which provides structured ratings of lips, tongue, gums, saliva, natural teeth, dentures, oral cleanliness, and oral pain (Wong, F. M. F et al., 2024). Visible denture plaque was additionally noted to support interpretation of hygiene behaviour.

Oral health-related quality of life was measured using the fourteen-item Oral Health Impact Profile, capturing functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap associated with oral problems (Jiang, C. M et al., 2025). All examinations were conducted by a trained dental professional who was not involved in delivering the education and who remained blinded to caregiver performance scores, thereby reducing expectancy bias during outcome assessment.

Caregiver performance outcomes were documented using a structured oral care checklist capturing cleaning frequency, procedural sequencing, mucosal evaluation, use of moisture support, and completion of documentation following each care episode. This monitoring approach aligns with evidence demonstrating that structured accountability frameworks support sustainability of hygiene practices in environments characterised by shift rotation and workload density. Caregivers also completed a brief self-administered questionnaire assessing perceived instructional clarity, confidence in oral care delivery, supervisory support, and feasibility of maintaining oral care within routine workload demands.

Following completion of the quantitative phase, semi-structured interviews were conducted with a purposive subsample of caregivers and unit supervisors. Interviews explored experiences of the education sessions, perceived changes in resident comfort, barriers to consistent implementation, and perceptions of how communication and supervision influenced oral care routines. Interviews were audio-recorded, transcribed verbatim, and anonymised prior to analysis.

Quantitative data were analysed using descriptive statistics and paired comparisons between baseline and post-intervention scores for plaque rating, mucosal condition, and

oral health-related quality of life. Selection of parametric or non-parametric tests was guided by distribution characteristics and sample size, with statistical significance set at a five percent threshold. Qualitative data were analysed using thematic analysis. Coding focused on four a priori domains educational content, reinforcement and supervision, workload integration, and perceived resident response while allowing additional themes to emerge inductively. Integration of quantitative and qualitative findings followed an explanatory logic, enabling clinical outcome changes to be interpreted alongside organisational and managerial processes shaping oral care practice.

C. Results and Discussion

Caregiver Performance Outcomes

At baseline, completion of the full oral care sequence was limited, with only 61% of caregivers performing all required procedural steps. Mucosal inspection was conducted in 48% of care episodes, while omission frequency remained relatively high at 29%. Checklist completeness reached 64%, and procedural retention was observed in 71% of caregivers (Table 1).

After structured oral care education was introduced and reinforced, caregiver performance improved progressively. By the end of the third reinforcement cycle, adherence to the complete oral care sequence increased to 89%, while mucosal inspection compliance rose to 85%. During the same period, omission frequency declined to 7%, checklist completeness increased to 91%, and procedural retention reached 93% (Table 1).

Alongside improvements in procedural adherence, the average duration of oral care per resident increased across observation periods. Mean care duration rose from approximately 8 minutes at baseline to 11 minutes at Week 2 and further increased to 14 minutes by Week 4 (Figure 1). This pattern reflects more complete execution of oral care procedures rather than reduced efficiency. Figure 3 presents the temporal trend of caregiver adherence across observation periods, complementing the summary values reported in Table 1.

Table 1. Changes in caregiver oral care performance indicators following structured education

Performance Indicator	Baseline (%)	Week 4 (%)
Adherence to complete oral care sequence	61	89
Mucosal inspection compliance	48	85
Omission frequency	29	7
Checklist completeness	64	91
Procedural retention	71	93

Values represent the proportion of caregivers demonstrating each performance indicator at baseline and after completion of the third educational reinforcement cycle.

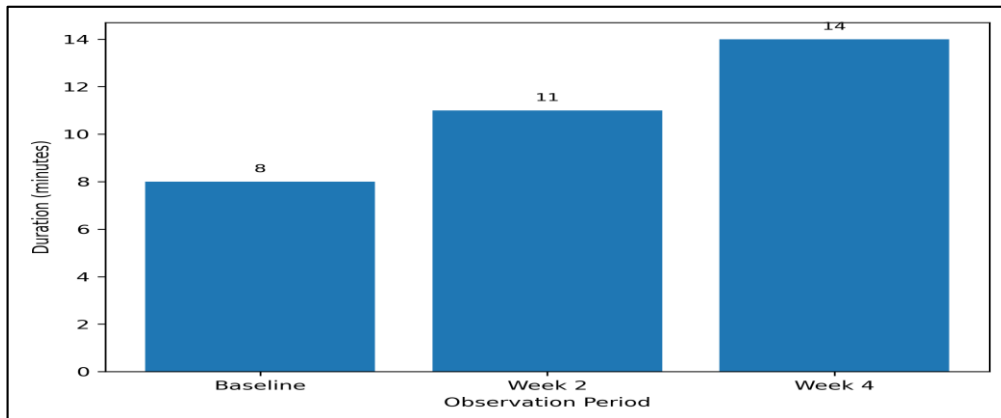


Figure 1. Average oral care duration per resident across observation periods

The figure shows the increase in average oral care duration per resident from baseline to Week 4 following structured oral care education.

Resident Oral Health Outcomes

Mean plaque index declined steadily across observation weeks, decreasing from 2.8 at baseline to 2.0 at Week 2 and reaching 1.4 by Week 4 (Figure 2). This downward trend indicates improved oral hygiene status among institutionalised older adults during the observation period.

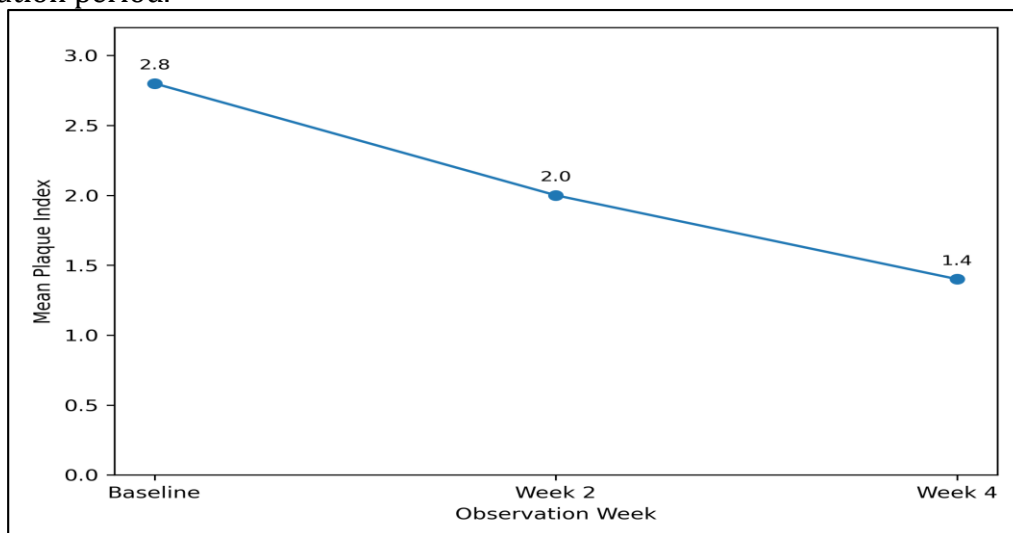


Figure 2. Trend of mean plaque index reduction across observation weeks

The figure illustrates the progressive reduction in mean plaque index from baseline to Week 4 following structured oral care education and reinforcement cycles. Qualitative observations also indicated improved denture cleanliness and reduced visible food debris. These changes were consistent with increased caregiver adherence to key procedural steps, particularly denture removal and mucosal inspection.

System-Level Indicators

System-level performance indicators strengthened following the reinforcement cycles. Workflow consistency during scheduled care periods increased from 56% at baseline to

84% after the third reinforcement cycle. Documentation accuracy showed a similar pattern, with checklist completeness improving from 64% to 91%. Communication clarity also improved, as reflected by fewer clarification requests and smoother task transitions observed by supervisors. Performance improvements were maintained through the fifteenth observation day, with no evidence of score decline. Improvements in system-level indicators occurred alongside progressive increases in caregiver adherence across observation periods, as illustrated in Figure 3 (Table 2).

Table 2. System-level indicators before and after intervention

Indicator	Baseline	After Reinforcement Cycle 3
Workflow consistency	56%	84%
Documentation accuracy	64%	91%
Communication clarity	Moderate	High
Reinforcement sustainability	Low	Stable
Resident cooperation	Low	Moderate to High

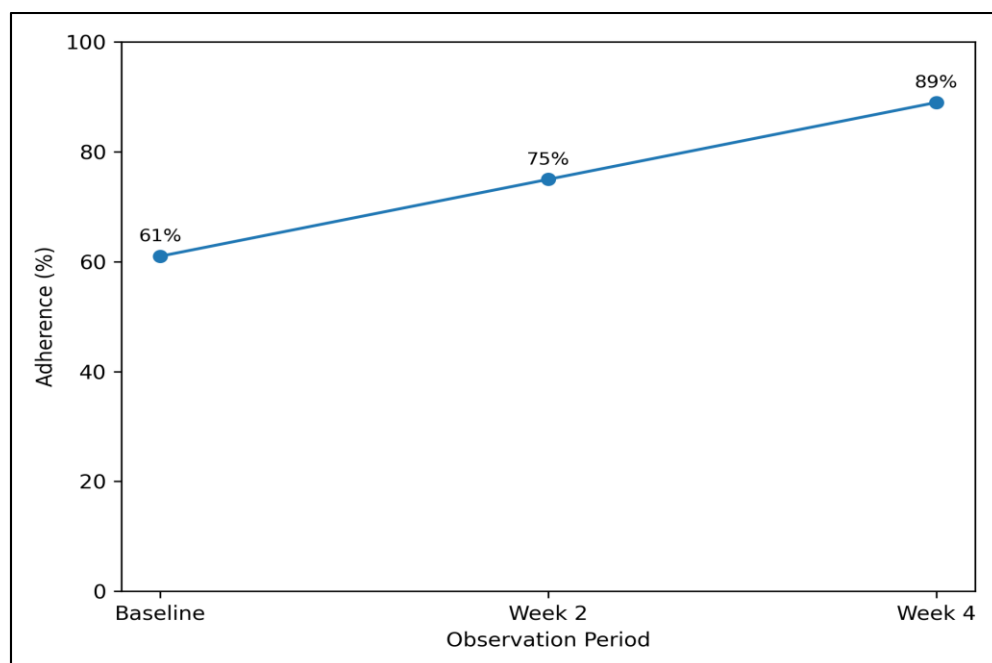


Figure 3. Caregiver adherence to the complete oral care sequence

The figure illustrates the improvement in caregiver adherence to the complete oral care sequence from baseline through Week 4 after educational reinforcement.

Non-Responsive Subgroup

Approximately 15% of residents demonstrated limited functional improvement despite overall gains in caregiver performance and hygiene indicators. This subgroup was characterised by higher multimorbidity burden and advanced frailty markers.

Mean chewing duration decreased modestly from 56 seconds per bite sequence at baseline to 51 seconds post-intervention. Mucosal irritation declined from 49% to 38%, remaining higher than in the overall cohort. These findings indicate that biological and functional constraints may limit responsiveness to hygiene-focused interventions in a subset of residents.

Impact of Structured Oral Care Education Management on Caregiver Performance

Within institutional care settings, caregiver performance is strongly shaped by how educational processes are organised, reinforced, and embedded into daily routines. The present findings indicate that structured oral care education management was associated with improved caregiver adherence, procedural retention, and task completion accuracy. The progressive increase in adherence observed across reinforcement cycles suggests that caregiver behaviour responds more effectively to repeated, structured educational exposure than to single-session instruction. This pattern aligns with educational management perspectives that conceptualise learning as a cumulative process influenced by reinforcement and environmental alignment rather than isolated knowledge transfer (Viebranz et al., 2023).

Improved compliance with mucosal inspection and denture hygiene steps indicates that structured education enhanced caregiver attention to care components that are often deprioritised in routine practice. Previous studies conducted in long-term care environments have shown that caregivers tend to focus on visible or time-pressured tasks unless procedural importance is reinforced through explicit guidance and supervision (Csikar et al., 2025; Pombo Lopes et al., 2025). The present findings are consistent with these observations, suggesting that visual demonstration, checklist-guided workflows, and repeated supervisory input support caregivers in internalising procedural sequencing rather than relying on task recall alone.

The increase in average oral care duration observed after reinforcement should be interpreted as a qualitative improvement rather than procedural inefficiency. Extended care time reflected more comprehensive task execution, including denture removal, mucosal assessment, and post-cleaning evaluation. Similar patterns have been reported in intervention studies where caregiver education initially increased task duration as procedural accuracy improved, followed by stabilisation as fluency developed (Chebib et al., 2025; Rani et al., 2025). Educational management literature further supports the view that time investment often increases during consolidation phases before routine efficiency is achieved (Purwadhi et al., 2025).

Procedural retention following the third reinforcement cycle highlights the importance of continuity in educational management. The marked reduction in omission frequency indicates that caregivers retained not only task knowledge but also the logical sequencing of care steps. Distributed learning theory suggests that reinforcement intervals enable

integration of new behaviours into routine memory, thereby reducing reliance on conscious recall during task performance (Viebranz et al., 2023). This finding supports the positioning of structured oral care education as an ongoing operational process rather than a standalone training programme.

From an educational management perspective, these findings underscore the role of organisational systems in shaping caregiver performance. Workflow clarity, documentation prompts, and supervisory feedback functioned collectively as educational scaffolding that stabilised caregiver behaviour. Management studies have demonstrated that employee adherence improves when instructional content is aligned with system-level cues and accountability mechanisms (Andriani & Disman, 2023; Handayani et al., 2025). The present study extends this principle into caregiver oral care practice by illustrating how educational processes embedded within daily routines support consistent performance.

Nevertheless, educational interventions do not uniformly result in improved adherence across all institutional contexts. A multi-site evaluation by Saarela et al. (2022) reported modest adherence gains in facilities characterised by high staff turnover and workload saturation, despite improvements in caregiver knowledge. This contrast suggests that the effectiveness of educational management is contingent upon organisational stability and reinforcement capacity. The current study was conducted in a setting with consistent caregiver assignment and structured reinforcement scheduling, which may partly explain the stronger adherence outcomes observed.

Interpretation of these findings should therefore be situated within institutional environments where caregiver continuity and supervisory reinforcement are present. The results primarily reflect the effectiveness of educational management under conditions of organisational support and may not directly generalise to facilities lacking stable staffing structures or routine supervisory oversight.

Overall, findings addressing Research Question 1 indicate that structured oral care education management contributes to improved caregiver performance when reinforcement cycles and organisational alignment are in place. Performance improvement appears to arise not solely from increased knowledge acquisition but from the integration of educational content into operational workflows and accountability structures. This supports the view that caregiver education functions most effectively as a managed process embedded within institutional systems rather than as a time-limited instructional activity.

Influence of Caregiver Performance on Oral Health Outcomes and Oral Health Related Quality of Life in Institutionalised Older Adults

Within institutional care environments, the quality of daily oral care delivery is closely linked to caregiver performance, particularly in settings where residents depend on assisted hygiene. Findings related to Research Question 2 indicate that improvements in caregiver adherence and procedural consistency were associated with favourable changes in oral health outcomes and oral health-related quality of life among institutionalised older adults. Reductions in plaque accumulation, improved denture condition, and decreased

mucosal irritation observed in this study are consistent with evidence identifying oral hygiene quality as a key determinant of comfort and functional wellbeing in long-term care residents (Bianco et al., 2021; Medeiros et al., 2023).

Observed reductions in oral discomfort and mucosal irritation align with findings from systematic evaluations of oral hygiene practices in dependent and cognitively impaired older adults. Reviews focusing on institutional dementia care have identified inadequate daily oral care as a primary contributor to chronic mucosal inflammation and discomfort, particularly when residents rely entirely on caregivers for hygiene support (Delwel et al., 2020). Improved caregiver adherence to structured oral care routines in the present study therefore appears to mitigate tissue-level irritation through more consistent cleaning, inspection, and moisture management.

Changes in denture condition and chewing comfort further support the association between caregiver performance and functional oral outcomes. Research conducted in long-term care facilities has demonstrated that poorly maintained dentures and unrecognised mucosal lesions are associated with pain, impaired mastication, and dissatisfaction during meals (Medeiros et al., 2023; Saarela et al., 2022). The present findings suggest that caregiver attention to denture removal, cleaning, and routine mucosal inspection contributes to improved oral function and reduced discomfort during eating.

Improvements in chewing confidence and eating comfort observed in this study are consistent with broader evidence linking oral health status to quality of life and nutritional wellbeing in institutionalised older adults. Previous studies have shown that compromised oral conditions restrict food choices, prolong chewing time, and reduce meal enjoyment, thereby negatively influencing perceived quality of life (Bianco et al., 2021). Nutritional status has also been identified as a mediating factor in oral health-related quality of life, with poor oral comfort associated with reduced intake and lower wellbeing scores (Pola et al., 2025). Within this context, improved caregiver-mediated oral care may support quality of life indirectly by facilitating more comfortable eating experiences.

The association between caregiver performance and quality of life outcomes is further supported by evidence highlighting the importance of care process consistency in institutional settings. Observational studies in nursing homes have demonstrated that regular and predictable oral care routines are associated with better resident-reported comfort and satisfaction, whereas fragmented or inconsistent routines are linked to unmet hygiene needs and persistent discomfort (Hoben et al., 2022a). The present study extends this evidence by indicating that structured educational management enhances caregiver consistency, which in turn supports improvements in oral comfort and perceived wellbeing.

However, improvements in oral health outcomes do not uniformly translate into substantial gains in perceived quality of life across all resident groups. Longitudinal research among institutionalised older adults has reported that although oral hygiene and denture comfort may improve, changes in self-reported quality of life can remain limited among residents with advanced frailty or severe cognitive impairment (Saarela et al., 2022). Similar patterns have been observed in evaluations of oral care interventions where

clinical improvements were not always accompanied by proportional changes in subjective wellbeing (Hoben et al., 2022b). These findings suggest that biological vulnerability and cognitive decline may constrain perceived quality of life gains despite improved oral conditions.

Interpretation of these findings should therefore acknowledge that caregiver performance represents one component within a broader constellation of factors influencing quality of life in institutionalised older adults. While structured oral care education appears to support improvements in oral comfort and function, the extent to which these changes translate into enhanced quality of life may depend on resident health status, cognitive capacity, and overall care context.

Overall, findings addressing Research Question 2 support the view that caregiver performance plays a meaningful role in shaping oral health outcomes and oral health-related quality of life among institutionalised older adults. Structured educational management that improves caregiver adherence and procedural consistency appears to contribute to reduced oral discomfort, improved chewing function, and enhanced daily comfort. These findings underscore the importance of caregiver-mediated care processes as a pathway through which oral health interventions may influence quality of life in long-term care settings.

Sustainability and Institutionalisation of Structured Oral Care Education Management in Long Term Care Settings

Sustainability of educational interventions in long-term care depends largely on how learning processes are embedded into organisational routines rather than delivered as isolated activities. Findings addressing Research Question 3 indicate that structured oral care education management demonstrated strong potential for sustainability when reinforcement cycles were aligned with institutional workflows, supervision, and documentation systems. The maintenance of improved caregiver adherence and oral health outcomes through the final observation period suggests that reinforcement-based education supported behavioural stabilisation beyond the initial learning phase.

Educational management theory emphasises that sustainable practice emerges when new skills are repeatedly enacted within routine task structures and supported by environmental cues. In this study, adherence and procedural accuracy did not decline after the final reinforcement cycle, indicating consolidation of learned behaviours. This pattern is consistent with healthcare training research showing that skills reinforced through iterative cycles are more likely to be retained than those introduced through single-session instruction, particularly in settings characterised by high task density and cognitive load (Viebranz et al., 2023). Similar findings have been reported in geriatric care education studies, where repeated modelling and feedback reduced procedural drift over time (Csikar et al., 2025; Rani et al., 2025).

The institutionalisation of structured oral care education was further supported by alignment between educational content and organisational infrastructure. Improvements observed in documentation completeness, workflow timing, and communication clarity indicate that caregiver behaviour was reinforced by system-level supports rather than dependent solely on individual motivation. Organisational learning literature consistently

demonstrates that employee behaviour stabilises when educational messages are reinforced through policies, checklists, and supervisory monitoring (Andriani & Disman, 2023). In healthcare contexts, such alignment reduces variability in practice and supports consistent care delivery across shifts and staff rotations (Handayani et al., 2025).

Scalability of the educational approach is also suggested by its compatibility with existing institutional processes. Unlike resource-intensive clinical interventions, structured educational reinforcement relies primarily on scheduling, visual guidance, and supervisory feedback. These elements can be adapted across care facilities without substantial infrastructure investment. Evidence from studies examining the scale-up of caregiver education programmes indicates that interventions grounded in routine task integration demonstrate higher adoption rates and lower implementation fatigue (Pombo Lopes et al., 2025). The present findings suggest that oral care education can be operationalised within daily caregiving routines, supporting feasibility in facilities with varying resource levels.

Nevertheless, sustainability was not uniform across all resident groups. The presence of a non-responsive subgroup highlights that educational optimisation has biological and functional limits. Previous research has shown that advanced frailty, multimorbidity, and cognitive decline may attenuate functional gains derived from improved oral care, even when caregiver adherence is high (Saarela et al., 2022). This observation underscores the importance of distinguishing between sustainability of caregiver behaviour and variability in resident outcomes.

From a management education perspective, the findings indicate that structured oral care education functions most effectively when positioned as an ongoing institutional practice rather than a time-limited programme. Educational reinforcement synchronised with supervision, performance monitoring, and workflow design transforms training into a governance mechanism that shapes everyday practice. Management studies in healthcare education have highlighted that such integration shifts education from knowledge transmission toward behavioural regulation embedded within organisational systems (Bakker et al., 2024; Purwadhi et al., 2025).

The findings also carry implications for leadership and policy development in long-term care institutions. Formal incorporation of oral care education into standard operating procedures, staff orientation programmes, and performance evaluation frameworks may enhance sustainability and reduce reliance on individual initiative. Organisational health education research has consistently shown that leadership endorsement and procedural formalisation are critical for long-term adoption and quality assurance (Andriani & Disman, 2023). Evidence from the present study supports this view by demonstrating that structured education reinforced through institutional systems can stabilise caregiver performance over time.

Overall, findings related to Research Question 3 indicate that structured oral care education management is sustainable, scalable, and institutionally adaptable when reinforcement cycles are integrated with organisational systems. Sustainability appears to emerge through the convergence of educational design, caregiver engagement, and managerial infrastructure. These results position structured caregiver education as a strategic management intervention capable of supporting long-term quality improvement

in institutional oral care, rather than as a temporary training initiative.

D. Conclusions

This study demonstrates that structured oral care education management, when reinforced through supervision, routine documentation, and workflow integration, improves caregiver performance, supports better oral health outcomes, and contributes to enhanced oral health-related quality of life among institutionalised older adults. Improvements in adherence and procedural consistency among caregivers were accompanied by reductions in plaque accumulation, improved denture hygiene, and increased oral comfort, indicating that caregiver-mediated care plays a critical role in daily oral wellbeing. The sustainability of these improvements was evident when educational processes were embedded within organisational systems rather than delivered as isolated training activities. These findings highlight that oral care quality in long-term care settings is shaped not only by caregiver knowledge but by how education is managed, reinforced, and institutionalised within routine care structures.

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