Oral health assessment and care practices in long-term care: a convergent mixed methods study

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ABSTRACT

Background: Poor oral health in long-term care (LTC) impacts residents' nutrition, systemic health, and quality of life. LTC residents often face cognitive declines and functional limitations, limiting oral care and access to professional services. In one Atlantic Canadian LTC, this mixed-methods study investigates oral health assessment and care practices and the team's perception of a dental hygienist's role in LTC. **Methods:** Data were collected through semi-structured interviews and focus groups with residents, unpaid caregivers, and nursing and care staff, as well as through a retrospective chart review to explore oral health practices and their documentation. Qualitative and quantitative data underwent thematic and descriptive statistical analysis, respectively. **Results:** Between June 2023 and March 2024, thirty-four paid caregivers, six residents, and one unpaid caregiver participated, and 14 charts were reviewed. Findings reveal complex factors influencing oral health, including perceptions of inadequacy, cultural attitudes, challenges in implementing consistent care due to staff shortages and residents' responsiveness to oral care, and the critical role of the DH. **Conclusion:** The results highlight the need to integrate oral health professionals into LTC facilities and emphasize the importance of person-centred approaches to oral care to improve oral health practices and ultimately enhance residents' quality of life.

Keywords: caregivers; dental hygienists; dentistry; geriatric; long-term care; oral health; oral hygiene

CDHA Research Agenda category: access to care and unmet needs

INTRODUCTION

Poor oral health (OH) can interfere with nutritional intake and status (1), worsen systemic conditions (2–4), and negatively impact quality of life (5). Older adults living in LTC are more at risk for poor OH compared to the general population due to inadequate daily mouth care resulting from cognitive, physical, and functional declines (6–8), predisposing health conditions and associated medications (2,9), and lack of access to professional services. Accessing offsite professional oral care is challenging for LTC residents who struggle to adapt to new environments, lack transportation, and/or require caregiver accompaniment. Furthermore, many LTC residents rely on unpaid and paid caregivers (staff) to assist with daily oral care and to coordinate professional care (10–12).

Access to quality OH care in LTC is more critical than ever. Canada's population of adults aged 65 years and older is growing (13) alongside the increasing proportion of this population who maintain their natural teeth (14). A 2012 study in Atlantic Canada highlighted disparities in access to care and high rates of unmet OH needs among older adults living in LTC compared to older adults living independently (12). Since this study, guidelines for OH assessment and care planning have been developed for LTC. Little is known about current oral assessment and daily mouth care practices in LTC in Atlantic Canada.

An interprofessional approach is recommended to maintain good OH for LTC residents by promoting and delivering the *geriatric oral health triad*, which includes regular oral assessments, oral hygiene care (i.e., daily oral care and professional oral hygiene care), and dental treatment as required (10) Professional onsite services are particularly important for those who experience difficulty seeking external services and those who have chronic conditions linked to OH (1–9). The Dental Hygienist (DH) is considered a key team member; however, there is a paucity of literature regarding the integration of a DH into the LTC team in Canada. This study aims to

investigate oral health assessment and care practices and the perceived benefits of integrating dental hygienists (DH) into the interprofessional LTC team.

METHODS

Between July 2023 and March 2024, this convergent mixed methods study (qualitative descriptive and retrospective chart review) (15) was conducted at a 175+ bed LTC facility in Atlantic Canada (Fig. 2. Study design). This LTC was selected for its recent pilot of a DH staff position. Ethics approval (File #: 1027394) was obtained, including a waiver of the consent process for the retrospective chart review. All data have been de-identified, and references to staff positions are included only when relevant.

Research team reflexivity and positionality

The research design was informed by grounded theory techniques, including purposive and theoretical sampling, as well as concurrent qualitative and quantitative data collection and analysis (16). Researchers were able to practice reflexivity throughout the research process, allowing the study to evolve as data collection and analysis progressed (17). The PI (SH) is a dental hygienist with experience in geriatric care and research. Contrastingly, the research assistant (HC) was a Sociology graduate student with qualitative research experience and no background in OH. SH led the study design, HC collected data, and all authors contributed to the study design, data analysis and dissemination.

To situate the LTC facility, the site operates under provincial guidelines for LTC, including OH assessment and care provision. Provincial guidelines are not referenced in this publication to maintain the anonymity of the LTC facility; however, they were used during data collection and analysis as a benchmark to assess the adequacy of OH assessment and care planning practices.

Conceptual Framework

The Health Belief Model (HBM) is an accepted framework that suggests an individual's perception of a personal threat from an illness, combined with their belief in the effectiveness of the health behaviour, can predict the likelihood of adopting that behaviour. The interview guide was developed using the five dimensions and two constructs of the HBM (18–20; Figure 1).

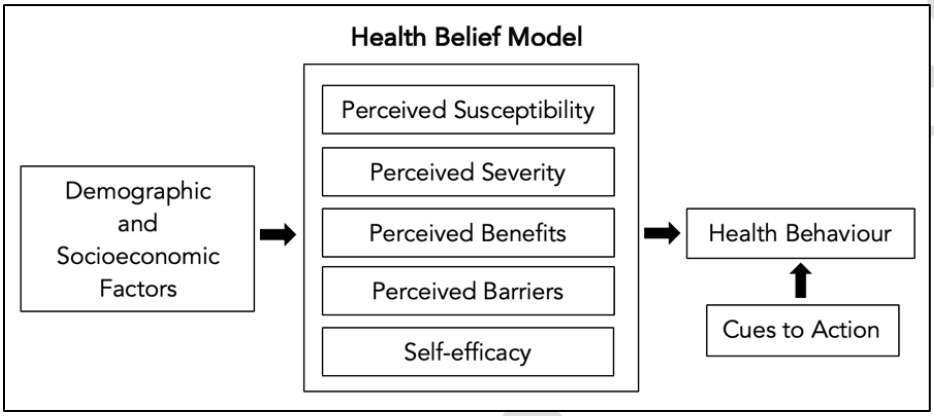

Figure 1. Health Belief Model

Qualitative

To gain multiple perspectives, the qualitative study included semi-structured interviews with LTC residents and unpaid caregivers, who also served as substitute decision-makers (SDMs), and focus groups with LTC staff involved in any aspect of oral care (i.e., Charge Nurses (CN), Registered Nurses (RN), Licensed Practical Nurses (LPN), and Care Team Assistants (CTA)).

The recruitment strategy included internal staff emails and the LTC's Advisory Groups, signage throughout the facility. Additionally, co-investigators and site staff (MH, NS-O) assisted in identifying staff participants. For those who expressed interest, the RA (HC) provided information about the study, screened for eligibility, and reviewed and obtained (verbal, audio-recorded) consent at the beginning of each interview. All participants were offered a gift card as a token of appreciation. (Figure 2. Study Design; Supp 1. Data collection guides).

Quantitative

Used in both the aging and oral health literature (21–23), quantitative data were collected by reviewing resident charts. Using G-Power software, a confidence level of 95% and a margin of error of ±4%, the required sample size for a full study was 136 charts. Ten percent of the sample is recommended for a pilot (24); therefore, data from 14 charts were extracted. Charts were randomly selected (two from each of the seven units) by placing residents' room numbers into an online randomization tool, excluding residents admitted within the past six months. Meeting with managerial nursing staff to identify relevant documentation and variables was critical to creating a comprehensive data extraction table. The RA (HC) extracted data from charts following training, calibration, and pilot testing of the data extraction process with the PI(SH). The past year of chart data was reviewed, specifically, documentation within the clinical geriatric assessment, oral assessment and care planning, and the nursing care plan and log of daily care. In addition, dependence during activities of daily living (ADLs), frailty scores, cognitive status (i.e., MMSE score) and communication status (e.g., speech, hearing, and vision impairments) were recorded.

Data analysis

Qualitative data were analyzed using a two-stage approach. All interview and focus group recordings were transcribed verbatim, coded, and thematically analyzed using Braun and Clarke's six-phase method. First, interview data were inductively coded to identify emergent themes. Thematic structures were achieved by 1) familiarizing with transcripts, 2) generating initial codes, 3) iteratively coding transcripts, 4) identifying emergent themes, 5) organizing a thematic map to review, and 6) defining identified themes (25). This first stage of data analysis allowed exploration of themes beyond the model, ensuring the model's appropriateness, and preventing data from being 'forced' into its framework. (26). From this analysis, eight themes emerged from the interview

data: 1) defining OH, 2) OH beliefs, 3) OH status, 4) onsite professional care, 5) oral care practices, 6) daily oral care plans, 7) orientation and training, and 8) facilitators and barriers to care. Researchers then independently mapped subthemes to the HBM model and compared their mapping until consensus was reached. Quotations from staff and the caregiver are indicated by their respective participant identification number (e.g., P10), and quotations from resident participants are specifically indicated using an R-prefix (e.g., R3). The supporting quotes presented in Table 4 are referenced using a Q-prefix (e.g., Q17).

The quantitative data from residents' charts were analyzed using StataNow 18.5, and descriptive statistics were calculated to show frequencies and measures of central tendency. Frailty and MMSE scores were categorized, based on criteria from Rockwood (27) and Davey and Jamieson (28), respectively. Due to a single mild level of frailty case, "mild" and "moderate" frailty were combined.

Figure 2. Convergent mixed methods design

RESULTS

Qualitative findings

A total of 42 people participated between June 2023 and March 2024, including 35 staff members (7 CNs, 16 RNs/LPNs, and 12 CTAs), 6 Residents and 1 unpaid caregiver (Table 1. Participant characteristics). Focus groups and individual interviews were 40-62 minutes in length. Field notes captured non-verbal cues.

Five in-person focus groups were conducted with staff during working hours: one with CNs, two with RNs and LPNs, and two with CTAs. The CNs had a separate session to minimize power imbalances. Member checking with staff was unsuccessful due to work commitments. A sixth focus group with CNs validated data analysis and further explored emerging themes.

Resident participants were interviewed individually, in person, and the one unpaid caregiver was interviewed virtually via Microsoft Teams. The caregiver reviewed their interview transcript; however, member-checking was not conducted with residents due to the brevity of their responses. With consent, the authors acknowledge that the unpaid caregiver participant is an OH care provider.

Social and psychosocial characteristics

When asked to define OH, many residents insinuated OH was genetically predetermined (Q1). In contrast, public health education was highlighted, specifically how daily oral care practices, like toothbrushing, were not taught at home (Q2) but in school (Q3). Residents also spoke about demographic and socioeconomic factors influencing their OH, including unaffordability, rurality, and lack of access to water fluoridation (Q4 -5).

When speaking about residents, staff expressed that oral care becomes less of a priority with age (Q6). Other staff contested this idea and proposed that residents' OH declines because of

staff practices (Q7). Staff identified culture and lived experience as influencing practice and, in turn, daily oral care for dependent residents (Q8). Additionally, a staff participant asserted that the complexity of care for residents is increasing and demands inhibit their ability to assist with oral care (Q9).

Perceived susceptibility

The resident's OH was described as "*inadequate*" (P21) and "*poor*" (P30), noting that a decline in OH typically accompanies cognitive decline (Q10). Some shared the belief that poor OH in LTC is inevitable (Q11), while others disputed this belief, suggesting OH depends on the resident's desire (Q12). The notion that oral care is low priority for residents was further contested when a staff participant suggested that residents did not ask for oral care because to not be a bother to staff or they forget to ask, referring to residents experiencing cognitive decline (Q13).

As previously mentioned, residents often cited genetics as the reason for their OH status. In contrast, many residents suggested that good OH depends on daily and professional OH care (Q14). For some residents, good OH meant retaining natural teeth (Q15) and was viewed as impossible to achieve without (Q16).

Perceived severity

When defining OH, staff participants positively described it as having a "*clean mouth, good oral hygiene*" (P34) and a "*healthy tongue*" (P30). Another staff participant described the mouth as requiring special care because "*the mouth is the gateway to the body"* (P5). They also cited a variety of negative repercussions of not maintaining the resident's OH, especially residents who are in pain, not eating and losing weight (Q17).

Many conversations surrounded the OH of residents with dementia. Staff stated that although residents may not explicitly tell you they're in pain, they have the expertise to identify the signs (Q18). Staff participants describe choosing whether to perform oral care as "*balance*", weighing the risk of upsetting residents with dementia by performing oral care against what is "*more important*", oral care or breakfast, for example (Q19).

Self-Efficacy

Staff orientation and training were identified as influencing staff's confidence in completing oral care and assessment practices. For example, some staff participants described their orientation to the facilities' OH Guidelines as a "*big education*" (P6), whereas others recalled having a "*faint*" (P14) recollection of the OH orientation and training, stating, "*I was never oriented towards it*" (P3). Some spoke of a desire for a more specific protocol and training that would provide them with the necessary skills for oral care (Q20). Others felt that since oral care is something we typically do for ourselves, there wasn't a need for formal orientation and training (Q21). While staff felt comfortable providing daily oral care (i.e. brushing), oral assessments were performed with less confidence (Q22). In turn, they reported consulting a physician when concerned with a resident's OH status and encountering pushback from physicians suggesting residents should see a dentist instead; however, they will manage "*certain circumstances,*" such as pain (Q23-24).

Residents expressed confidence in their ability to complete their daily oral care, citing their lifetime of experience as being key to their ability to do oral care independently (Q25). Among those who were less confident, resident participants shared a considerable desire to remain independent in their oral care, even if self-care may not provide them with the best outcome (Q26-27).

Like staff participants, the unpaid caregiver participant identified "refusal" as a key barrier in providing oral care. However, they described encouraging their loved one to accept care (Q28). While the caregiver wishes the resident to remain independent (Q29), they acknowledge that the level of independence can "*depend on his day* [and] *depend on his mood*" (Q30). Relatedly, the caregiver spoke about differences they observed between regular and temporary care staff, indicating the regular staff were more likely to attempt to overcome resistant behaviours and perform oral care (Q31).

Perceived barriers

Increasing medical complexity and care needs of LTC residents were proposed as contributing to increasing staff workloads. When asked about the barriers to residents' oral care, staff agreed that whether oral care is done depends on staff-to-resident ratios, competing care needs, time, and the residents' behaviour, resulting in inconsistent oral care practices. Staff described competing needs in the morning as particularly challenging and overstimulating for residents (Q32). Cleaning dentures in an ultrasonic denture bath was provided as an example that was *"not very practical"* (Q33). Staff acknowledged that the problem is perpetuated by inconsistent oral care practices, worsening residents' oral hygiene status, and increasing the time required for the staff to assist with oral care (Q34).

Staff participants identified residents' responsive behaviours as impeding oral care. They acknowledged that oral care was most often attempted at the end of care, when residents are often agitated and, therefore, more likely to refuse care or become responsive. They also acknowledged residents' right to refuse care (Q35). The rationale for the unique challenges experienced was that oral care is a *"closer kind of care"* (P8). Fear of harm was frequently reported and commonly described as being bitten. Staff believed residents' confusion leads to a perceived need to protect

themselves (Q36-37). For these reasons, one staff member proposed the idea that cognitive decline is an automatic precursor to declining OH (Q38). However, other staff challenged this idea and felt it was "*dangerous*" to assume these behaviours cannot be overcome (Q39).

Lastly, staff participants described how culture influences OH beliefs and, in turn, attitudes and personal and professional oral care practices (Q40). With rapidly changing staff and resident demographics, staff reiterated that culture is an important factor influencing oral care practices.

Perceived facilitators

Staff expressed a desire for "*care planning" (P32)* to create individualized approaches to oral care. A myriad of care planning options or facilitators for completing resident oral care were provided, such as attempting oral care in a "*quiet, calm space*" (P32) or *"right after the meds"* (P8) to help manage responsive behaviours in the morning. Similarly, staff used visual cues (Q41) or redirection to gain cooperation. Other staff discussed instances when they were successful after multiple attempts (Q42). In recognition of the busy nature of morning schedules, staff stated that they attempt oral care morning and night but suggest they are most successful before bedtime. One staff member emphasized how "*being really flexible and creative is super important*" (P34) and described how they provide a soft facecloth for the resident to bite on, reducing the risk of harm and improving care acceptance (Q43). Maintaining oral care routines was viewed as critical. The caregiver stated that "*any major change in routine*" (P36) would be disruptive to resident cooperation. Routine and care planning was emphasized by staff, who felt that it "*should be part of the plan, the routine that people have*" (P16).

Unpaid caregivers were viewed as *"allies*" (P34) in many ways. Specifically, staff participants commented that residents are more likely to cooperate when family members are present. The caregiver explained "*I always encourage him*" (P36) to do oral care, affirming the

staff participant's statements regarding the supportive role of caregivers. Another staff participant commented on families' willingness to buy supplies when asked. Allyship was also described by a resident participant, who stated that if they had a concern with their OH, they would *"get my daughter to look"* (R4). Similarly, the unpaid caregiver participant described increasing preventive measures by providing additional oral care for their loved one, even though it was routinely done by staff (Q44).

Perceived benefits (DH)

Staff participants described varied experiences with the on-site staff dental hygienist (DH). Overall, they recommended four key roles for the DH: 1) provide routine hygiene visits for all residents, 2) complete consults as needed, 3) coordinate offsite care, and 4) deliver staff education. They emphasized the need for a consistent DH presence. This consistent presence was reiterated by residents, with one stating, "*I am anxious to get in for a cleaning*" (R2). The unpaid caregiver participant found that booking an appointment with the staff dental hygienist "*was a very easy process*" (P36). They stated that the dental hygienist is "*such a wonderful resource to have*" and expressed that having this resource on-site is "*so necessary because it's too difficult for so many of the residents to get out* (into the community), *so to be able to keep them in their environment is so important*" (P36). When asked about how the on-site staff dental hygienist has impacted the care of their loved one, this caregiver expressed that maintaining adequate OH was one of the most important considerations when their loved one entered LTC (Q45).

Perceived benefits (OH)

While there was a strong awareness of the importance of oral care, it did not always translate into practice. Staff participants expressed differing values and proposed that these

differences contribute to inconsistent daily oral care practices among care staff. Staff found oral care to be the most challenging aspect of care, often prioritized last or not at all (Q46). Other staff stressed that regardless of the challenges, mouthcare should be a "*pertinent part of care*" (P31) due to OH being "*an indication of their overall health*" (P33).

Staff participants saw it as their role "*to maintain that comfort, speaking, no smell, eating comfortably*, [and] *swallowing well*" (P22). By providing routine oral care, staff reported identifying a "*correlation between OH and quality of life, and good health*," and "*those who have good OH tend to be more confident*" (P27). Similarly, a resident participant shared the desire to maintain their natural teeth and considered "*preventive work ... an investment*" (R2), while another resident emphasized the importance of "*taking good care of what you have*" (R1), as they felt that dentures were not as good as having their natural teeth. They also shared that by maintaining good OH, "*I can eat well now*," and can "*talk to people*" (R1).

Cues to action

Further emphasizing the role of the unpaid caregiver, staff participants consider their role to include that of an oral care advocate and suggest that advocacy improves care (Q47). However, attributed to changing demographics, a staff participant stated, "*we are getting a lot of people coming in with no family*" (P34). In this case, another staff participant empathetically stated that "*... we've bought supplies ourselves when we are grocery shopping*" (P30) for residents who do not have family support.

During initial and annual assessments, staff participants state that they use "*a checklist, like, 'is the mouth symmetrical, is there any pain, do they have like debris in their teeth'"* (P34). They also look for signs like "*bleeding, loose teeth, colour changes, disease*" (P8) and "*canker sores and stuff like that, if the gums are swollen or deteriorated*" (P9). However, unscheduled oral

assessments take place for a variety of reasons, such as when "*someone else reports something, like tooth decay, bleeding gums, loose tooth, some discomfort*" (P2) or "*when they* (residents) *stop eating as much*, [have] *pain when removing or putting their dentures in, or any swelling*" (P4).

After indicating that it would be inappropriate to ask an independent adult if they brushed their teeth (Q48), staff participants describe the observations they use to determine whether residents are performing daily oral care. One of them recalled how they take note of residents' toothbrushes to determine if they had been used (e.g., bristles were becoming worn) or whether supplies, such as toothpaste, need replenishing.

When asked about how the level of ADL assistance was determined versus OH assistance, a staff participant described, *"there's people that can't move around in bed and get dressed, but once they're set up, they can (do oral care)"* (P32). Another participant explained that they determine level of dependency for oral care through observation, which often happens during mealtimes since *"eating it can be independent, so if they're [able to] put the spoon to them, then they can do the same thing with a toothbrush"* (P34). They further elaborated that the residents who are deemed independent *"may not do the perfect job of doing their care, but … they can hold it (toothbrush), and they do a little bit*" (P34).

Quantitative findings

Documentation of OH practices was reviewed from 14 resident charts. Residents were between 84 to 99 years, with a mean age 92 years. More than half (57%) were men. Half were severely frail, had moderate or severe MMSE score or experienced a communication impairment. Only 15% exhibited responsive behaviour. Most (57%) residents had partial or full dentures and only 36% had natural teeth. While 72% required assistance ADLs, only 50% required assistance with oral care. While oral care was completed 1.26 times per day on average, five resident charts

indicated no daily oral care on one or more days. (Table 2) Days without oral care were most often attributed to residents' refusal.

When data extraction began, it was apparent that residents' charts were becoming digitized. and some of the chart documentation from the previous year was inaccessible. Relevant documentation, such as nursing care plans, OH assessments, and clinical geriatric assessments, remained; however, the nursing basic care flow record documentation had been restarted. On average, a month of care flow records was available for each resident.

Inconsistent and incomplete chart documentation was observed. For example, a resident's nursing care plan stated they have upper and lower natural teeth, while the OH assessment stated that they had complete upper and lower dentures. Initial or annual oral assessment(s) were missing for four residents. Lastly, a complete oral care plan was defined as including recommended hygiene techniques and products, and most (n=11) of the oral care plans were incomplete. (Table 2)

Of the 14 charts reviewed, only 10 had complete documentation of frailty and MMSE scores, communication status, responsive behaviours, dentate status, and level of ADL and oral care assistance. Table 3 reports percentages of missing oral assessments, missing or incomplete oral care plans, and at least one day without documented oral care among these 10 charts. Either an initial or annual oral assessment was missing from charts among the residents with severe frailty, "may be normal" or "mild" MMSE scores, and natural teeth or natural teeth and dentures. Oral care plans were missing or incomplete from charts among all the residents with natural teeth and partial dentures and residents who did not require assistance with oral care. Furthermore, residents with complete dentures and residents who independently complete their care were missing documentation of daily oral care less often. Average frequencies of oral care per day were also recorded in Table 3. Our chart review suggests oral care was completed most

frequently among residents without a communication impairment (1.29x/day) and the least often among residents with responsive behaviours (1.03x/day).

DISCUSSION

Using a mixed methods research design, oral assessment and care practices in LTC and perceptions of integrating a DH into the interprofessional care team were explored. Two emerging themes span the HBM framework: 1) OH in LTC is multifactorial and complex, and 2) LTC policy and supports matter.

OH in LTC is multifactorial and complex

The perception among staff was that OH in LTC is generally poor, especially among residents with cognitive decline. Participants discussed a range of immutable and mutable contributing factors. In contrast to the belief that daily oral care and professional care were drivers of good OH, genetic factors were said to pre-determine OH status. Similarly, rurality, financial constraints and level of health literacy resulting from one's upbringing were also thought to pre-determine OH status. This highlights the need to improve upon LTC residents' self-efficacy to maintain good OH.

Changing demographics in LTC were viewed by staff as a barrier, resulting in more oral care dependency. The aging population is increasing the demand for LTC, and wait times for placement are longer (29). Similarly, many older adults want to age in place and only consider transitioning to LTC late in life (30). Therefore, an older LTC population with more complex comorbidities and care dependency is emerging (31). In tandem, the complexity of oral care is increasing. People are retaining their natural teeth for longer (14), and tooth replacement options

are more advanced. Dental implants gained popularity during the early 2000s, and will inevitably become more prevalent in LTC, and caregivers will be faced with this additional challenge (32).

Canada's workforce is also becoming more diverse (33,34). Within this study, staff highlight how culture and social background influence OH attitudes and personal and professional practices. Moreover, as newcomers and refugees age, the LTC resident population will become more diverse (35). Both scenarios present challenges and opportunities to support paid caregivers through education and training, and policy which enable culturally responsive approaches to oral care (36).

Lastly, within this theme, oral care emerged as a challenging but pertinent aspect of care. OH was viewed as an investment in health and well-being, to reduce pain, inadequate nutrition, and impact on systemic disease. However, maintaining good OH for residents with cognitive decline was viewed as impossible by many of the staff members. Oral care is viewed as the "*most challenging*" aspect of care and fear of harm (being bitten), and residents' refusal were commonly reported barriers. Attributed to high rates of staff turnover and vacancies, insufficient time to overcome these barriers was also reported by Soilemezi et al (37). There is a need to empower paid caregivers with adequate time, communication strategies, and person-centred approaches when providing oral care to LTC residents experiencing cognitive decline.

LTC policy and support matters

Oral care independence is desired by residents and families. Positive outcomes when residents remain independent in their oral care are well-documented, and by extension, independence allows residents to maintain a sense of identity (38). Residents must be supported to remain independent. This can be accomplished by including adaptive oral care and memory aids as part of the care planning. Person-centered care planning was viewed as a facilitator of care and

a means to improve acceptance of care by residents with responsive behaviours, especially for new or temporary staff unfamiliar with residents. Specifically, staff participants reported that care planning must accommodate the resident's routine, allowing for oral care to happen at the time of day that works best for the resident and routine attempts when residents are reluctant to accept care. Unpaid caregivers should be considered during care planning as they are viewed as allies and capable of improving residents' acceptance of care. It is notable that in this study, the ability to implement an oral care plan depended on staff-to-resident ratios. This finding is consistent with the Chen et al. study, which reported that nurses with fewer residents to care for throughout the day had a better attitude and self-efficacy toward performing oral care, the highest being among nurses with 6 or fewer residents (39).

Staff are "…*trained to brush their teeth*" but acknowledge the need to identify and intervene at earlier stages of oral disease and the need for domiciliary professional care. The onsite dental hygienist role was defined as the onsite dental hygiene clinician, consultant for staff and residents, coordinator of offsite care as needed, and educator. While not common practice, these study findings and other recent literature (40) support the integration of OH professionals within the LTC care team. System and institutional policy change is needed to make this role the norm.

The quantitative results provided the opportunity to triangulate the qualitative data. Table 3 displays OH documentation that compares differences within and between variables. Only charts with complete documentation were included (N=10). Although the retrospective chart review was not adequately powered to conduct complex statistical analyses, this investigation offers insights into patterns warranting further exploration. Staff view cognitive decline as a risk factor for oral decline and find dentures easier to care for than natural teeth. Chart documentation findings support staff views. Based on the chart findings, residents who are cognitively well or only mildly

impaired, severely frail and dependent on others for ADLs, and have natural teeth appear more likely to be missing an initial or annual oral assessment.

While only two charts indicated responsive behaviours, the average frequency of oral care per day, being the lowest, corroborates the staff's fear of harm and the resident's reluctance to accept care. The frequency of oral care was highest for residents without a communication impairment. Staff participants refuted the belief that residents did not want daily oral care. Instead, they felt that the residents did not ask for oral care because they were forgetful or did not want to burden staff. These findings suggest that communication influences the frequency of daily oral care.

All residents assessed as independent to complete oral care did not have a complete or any oral care plan on file. This aligns with the belief that staff do not feel it is their place to monitor whether independent residents do their daily oral care. Despite some staff participants acknowledging that they do not monitor residents' self-care, chart documentation suggests that residents who independently complete their care are less likely to go a day without oral care compared to their counterparts who require assistance. Furthermore, assessing the level of dependence for oral care varied among staff. As part of the oral assessment, implementation science research measuring the utility of a performance-based assessment tool that includes oral hygiene status is warranted.

Incomplete or missing oral care plans were more frequent among residents with complete or partial dentures, and those with complete dentures were less likely to go a day without oral care. The authors propose that staff confidence in caring for dentures may contribute to these findings. While denture care was considered easy, use of the LTC unit's ultrasonic denture cleaner was thought to be impractical. The efficacy of ultrasonic denture cleaning is in question, though they

are recommended (41,42). The authors suggest that individual ultrasonic home-care denture cleaners be considered when care planning.

Ongoing efforts to improve OH in LTC

Since this study concluded, nurse educators have made concerted efforts to focus on OH during staff orientation. The nurse educators are collaborating with the staff DH to promote awareness of available on-site services. The DH now participates in OH education during the orientation of all new hires (RN/LPN/CTA & allied health). During orientation sessions, oral assessment and care planning are reviewed. Additionally, they have included demonstrations of oral care aids, approaches to providing oral care to residents with cognitive decline and simulation with a manikin, allowing staff to practice oral care techniques.

Future directions

This study provides baseline data to measure the impact of the integration of the dental hygienist through natural experimental research. It also contributes to a gap in the literature, as previous evidence of minimizing resistant care behaviours is over a decade old and not on oral care specifically (43). To empower caregivers, there is a need to synthesize existing evidence on communication strategies and approaches to oral care for LTC residents experiencing cognitive decline.

Limitations

The study was conducted in one LTC in the Atlantic region of Canada, and thus, observations may not be generalizable to other LTC facilities. Only one unpaid caregiver, also an OH care provider, participated, limiting the generalizability to other unpaid caregivers. The brevity of residents' responses may have affected the validity of the conclusions drawn. The professional

roles of the staff were not reported throughout the results to protect anonymity; therefore, differences in professional perspectives are unknown. Also, there is potential for bias due to team members, HC and SH involvement in multiple stages of the study. Also, the pilot retrospective chart review included a small sample of charts. There was also missing and inconsistent chart documentation; however, this key finding prompts the recommendation to improve documentation practices.

CONCLUSION

Oral care in LTC is complex and challenging. Study findings affirm a need to improve oral care practices and develop new strategies. Person-centered care planning for oral assessment and care practices can improve self-efficacy and support residents in remaining independent for oral care when possible. Care planning must consider communication, harm reduction strategies, and caregiver allyship. Integrating the dental hygienist into the LTC care team is essential to enhance health outcomes and quality of life for LTC residents.

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CONFLICT OF INTEREST

The study authors have no conflict of interest to declare.

Practice Relevance

1. Dental Hygienists play an important role in long-term care and are valued among long-term care teams.

2. Person-centered oral care planning that aligns with residents' routines and preferences can improve acceptance and adherence to care.

3. Enhanced Training and standardized protocols for oral assessments, oral care and documentation will support consistency and improve care outcomes.

Supplement 1. Data collection guides

Nursing and Care Staff

Interview Guide

1. How do you prioritize your day?
    a. When considering all of the Resident's needs and your demanding role, how important is oral health care?
        i. What is prioritized over oral health?

2. What does oral health mean to you?

Preamble: To situate ourselves and make sure we are both on the same page when we are talking about oral health, I am going to provide you with the definitions of oral health our team is using.

Oral health is defined as the ability to speak, smile, smell, taste, touch, chew, swallow, and confidently convey emotion without pain, discomfort or disease. Oral diseases encompass a range of diseases and conditions that include dental caries, periodontal or gum disease, tooth loss, oral cancer, oro-dental trauma

This binder *(show binder)* outlines the (*name of the institution*) Oral Health Program and guidelines. As noted in the (*name of the institution*) Oral Health Program: Good oral health is important beyond preventing tooth decay and tooth loss, as poor oral health is linked with other serious diseases such as aspiration pneumonia, bacterial endocarditis, stroke, heart disease and sepsis. As well, people with poor oral health often have decreased socialization due to mouth odour, difficulty eating and mouth discomfort.

3. Can you tell me about the (*name of the institution*) oral health guidelines?
    a. Oral assessment
    b. Daily mouthcare
    c. Onboarding/training

4. In general, how would you describe the resident's oral health?
    a. How would you describe the difference between good and poor oral health?
    b. What contributes to these differences?

5. How would you describe your role in caring for the mouth of Resident
    a. Can you describe how it differs between Residents?
    b. What do you look for in the Resident's mouth?
    c. How do you approach daily mouthcare?
    d. What do you do when there is a concern?
        i. Seek advice
        ii. Refer
        iii. Document

6. What helps you assist with oral care for Residents?

7. What obstacles/challenges or barriers do you face with assisting with oral care for Residents?

8. **(*For RNs only*)** What prompts you to conduct a formal oral health assessment?
   a. How often formal assessments are conducted?
   b. Are you confident in your ability to conduct this formal assessment?

9. **(*For RNs only*)** What factors do you consider when creating a Resident mouthcare plan?
   a. Are you confident in your plan?

10. What can you tell me about the staff dental hygienist's role?
    a. Can you tell me about your experience with the staff dental hygienist?
        i. What would prompt you to consult or seek the services of the hygienist?
        ii. Has the onsite staff Dental Hygienist impacted your work/ Resident care?
        iii. Has the Dalhousie Dental Hygiene students impacted your work/resident care?

11. Can you describe a time that a resident made a comment about how their oral health affected their day-to-day life?

12. Do you have recommendations or suggestions for the (*name of the institution*) to improve Resident oral health?
    a. For the Dental Hygienist

13. Before we finish, is there anything else you would like to tell me?

Post-Interview Demographic Questionnaire

1. How long have you been in your current position?

2. Have you worked in long-term care before your current role? If so, what roles did you have, and how long were you in the role(s)?

3. Are there any roles you've had (*professionally, volunteer, recreationally, etc.*) that have shaped your answers for today? For example, if you have previously worked as a dental hygienist.

4. What is your gender? Please note that we understand gender as a social identity; therefore, it may be different than your assigned sex at birth.

5. How old are you?

6. Is there something that I did not ask in the interview but feel you would like to tell me?

Residents and Family & Friend Caregivers

Interview Guide (Residents and Family & Friend Caregivers)

1. What does oral health mean to you?

2. Can you tell me about your *(or family member/friend's name)* oral health?
   a. What do you *(or family member/friend's name)* need to have good oral health?
   b. What are some of your (*their)* common oral health needs?
   c. Do you think your *(or family members/friend's name)* oral health needs are met?

Preamble: To situate ourselves and make sure we are both on the same page when we are talking about oral health, I am going to provide you with the definitions of oral health our team is using.

Oral health is defined as the ability to speak, smile, smell, taste, touch, chew, swallow, and confidently convey emotion without pain, discomfort or disease. Oral diseases encompass a range of diseases and conditions that include dental caries, periodontal or gum disease, tooth loss, oral cancer, oro-dental trauma

3. Can you tell me about a time when oral health impacted your (*their)* life?
   a. Have things changed since coming to long-term care?
   b. Why do you think these differences occurred?

4. Please describe your *(or family member/friend's name)* experience seeking oral health care from a dentist, dental hygienist etc.?
   a. Has this changed since coming to LTC?
   b. Why do you think these changes occurred?
   c. What happens when you have a problem in your *(or family members/friend's name)* mouth?

5. How well is your *(or family members/friend's name)* mouth cared for?
   a. Facilitators
   b. Barriers

6. Can you describe a time when accessing oral health care was easy?

7. Can you describe a time when accessing oral health care was difficult?

8. The dental hygienist is a new role at (*name of the institution*). What do you know about this role?

9. Can you tell me about an experience you had where you sought out care from the onsite dental hygienist?
   a. What led you to seek out this care?
   b. What difference did receiving this care make?

10. Do you have recommendations or suggestions for the (*name of the institution*) to improve Resident oral health?
    a. For the Dental Hygienist

11. Before we finish, is there anything else you would like to tell me?

Post-Interview Demographic Questionnaire (Residents)

1. How long have you been a resident at (*name of the institution*)?

2. Have you been a resident at any other care homes before being at (*name of the institution*)?

3. Are there any roles you've had (*professionally, volunteer, recreationally, etc.*) that have shaped your answers for today? For example, if you have previously worked as a dental hygienist.

4. What is your gender? Please note that we understand gender as a social identity; therefore, it may be different than your assigned sex at birth.

5. How old are you?

6. Is there something that I did not ask in the interview but feel you would like to tell me?

Post-Interview Demographic Questionnaire: Family & Friend Caregivers

1. How long have you been a caregiver for your loved one?

2. Are there any roles you've had (*professionally, volunteer, recreationally, etc.*) that have shaped your answers for today? For example, if you have previously worked as a dental hygienist.

3. What is your gender? Please note that we understand gender as a social identity; therefore, it may be different than your assigned sex at birth.

4. How old are you?

5. What is your gender? Please note that we understand gender as a social identity; therefore, it may be different than your assigned sex at birth.

6. Is there something that I did not ask in the interview but feel you would like to tell me?

Supplement 2. Participant Responses	
Social and Psychosocial Characteristics	
Quote 1	"*My grandfather had such perfect teeth, so a small gene must have got bogged* [or passed] *on*" (R3).
Quote 2	Daily mouth care practices, like toothbrushing, "*wouldn't be taught at home*" (R2).
Quote 3	"The [public health nurse] *came in the 50s,*" and she worked in "*the schools, and she went around and taught them oral health, and taught them how to clean themselves*" (R2).
Quote 4	"*Nobody in my family had their own teeth….* I *had dentures since I was a teenager... I grew up in a family of 15, and we lived in a rural area; we had no dental care… I know darn well they wouldn't have been able to afford it...Growing up in a rural area, we didn't see dentists*" (R1).
Quote 5	"*In a rural area, we have the well water*" (R1).
Quote 6	"*At a certain age, the residents, or the patients, mouth care is no longer a priority; they are not requesting it*" (P22).
Quote 7	a decline in residents' OH is "*a matter of staff practices*" (P33).
Quote 8	"*Their own beliefs and where they came from. Because, keep in mind, our staff is from all over; we're not just talking about here; we're talking about from other countries and what their experiences are with oral health. So, depending on where they are, were they able to brush their teeth every day*?" (P33)
Quote 9	"*I feel the floors are changing as a whole as well, … now we are getting more long-term care patients that require more care, a lot heavier on the call bells"* (P34).
Perceived Susceptibility	
Quote 10	"*If they're cognitively well, it's (OH) good. Once their cognition declines, then you'll see a decrease in oral health*" (P32).
Quote 11	"*By the time we eventually notice that there's an issue, it's already too late for their teeth*" (P21).
Quote 12	"*I don't believe that it's just inevitable. But we can only help them with what they want*" (P35).
Quote 13	"*I think that a lot of the time it's not that they're not asking, it's that they're forgetting, or they don't want to be a bother to care providers*" (P33).
Quote 14	"*I clean mine* (teeth) *every day, and I use* [name brand] *mouthwash every day, and I look after them well. I get a cleaning twice a year*" (R1).
Quote 15	"*Good oral health, to me, means that my teeth are clean, and I still have my* [natural] *teeth*" (R3).
Quote 16	"*I don't have any teeth, so I guess I don't have oral health*" (R4).
Perceived Severity	
Quote 17	"*If their* (resident) *tooth is hurting, they're not eating, they're losing weight, they're getting sick*" (P35).
Quote 18	"*Even with dementia, we will know if you have pain. We all know that we all have expertise here*" (P3).
Quote 19	*"It's like balancing dementia here ... if we do this (mouth care) right now, and it's first in the morning, they might be so upset about it that they're not gonna eat breakfast, and you have to balance ... is breakfast more important right now or is brushing their teeth"* (P35).
Self-Efficacy	
Quote 20	"*If we had a culture where we know that we need to do oral care and we are oriented to that, it would be different. It's not on the individual, it's at the institutional level*," specifically through "*a program* [that] *would change things*" (P27).
Quote 21	"*If we had a culture where we know that we need to do oral care and we are oriented to that, it would be different. It's not on the individual, it's at the institutional level*," specifically through "*a program* [that] *would change things*" (P27).
Quote 22	"W*e're not trained in dentistry... we're trained how to brush their teeth*" (P3).
Quote 23	"*The doctors are like* '*I'm not a dentist, they should go to the dentist*"' (P33).
Quote 24	the physician will "*...treat certain circumstances, like if there's pain, they'll treat for the pain. But they still recommend for them to go to the dentist to address that root cause*" (P35).
Quote 25	"*I can do it myself. I have been doing this for 50 years*" (R5).
Quote 26	*"I wash myself, I clean myself, I dress myself*" (R3).
Quote 27	*"Sometimes, if I am having a bad day, they (staff) will ask if I need help, but I tell them no. I can do it on my own. It might not be good, but it's better than nothing"* (R6).
Quote 28	"*Generally, I can convince him if he's resistant... I have ways that I can kind of coax him, I guess, like I'll say to him,* '*ok* [name], *this is important, we want to keep everything healthy*,' *and those types of things*" (P36).

Quote 29	*"Most times he* (resident) *will do it himself. And I think it's important to still let him do what he can*" (P36).
Quote 30	These independent efforts can "*depend on his day* [and] *depend on his mood...* sometimes [he] will "*be like 'nope, not happening, and I don't argue with him because it's like, well, at least it happened once today. And if it doesn't happen tonight, it will happen tomorrow, and I have to be ok with that"* (P36).
Quote 31	*"I do notice differences in maybe the attention to detail when there's someone who is temporary rather than someone who is a little more regular… Something I have noticed is that it's more of an 'oh well.' Like, he'll say 'well, I don't want to brush my teeth today,' and they'll just say 'ok' and walk away, and then maybe it doesn't get done"* (P36).
Perceived Barriers	
Quote 32	"*When we are getting everybody up in the morning, and we are trying to do it in an efficient, quick way, I think that's where it gets hard*" (P32).
Quote 33	The ultrasonic denture cleaners were described as "*not very practical" ... If you're putting that in there (dentures in the cleaner) and there's 500 bells going on, you're going to leave them, and when you come back you might be like 'whose dentures are these?'"* (P34).
Quote 34	As one CN described, *"you'll hear staff saying 'oh, his mouth is a mess" like, it's full of debris and stuff like that. So, then it's like, well, how long has it been left like that?" ...* When staff have the opportunity to do mouth care, "*the person that's left focusing in on the mouth care is left with a lot more than if it was done consistently*," and in turn, "*it becomes a bit more of a time suck, the more time that goes on*" (P32).
Quote 35	*"No matter how try it, you can't just go and stick the toothbrush in because that's abuse"* (P33).
Quote 36	*"Because you're close to them, and you can get hurt, or bit, or anything else"* (P11).
Quote 37	*"People are very protective over their mouth, especially if they're more confused, that a very private, personal part. It's like a safeguard, like why would I want someone's hands in my mouth* (P34)?"
Quote 38	*"If they're (residents) cognitively well, it's (oral health) good. Once their cognition declines, then you'll see a decrease in oral health"* (P29).
Quote 39	*"To me that's a little bit of a dangerous statement. Because I feel like if behaviours are stopping you from doing something, then the behaviours should be addressed. And there should be some kind of care coming in, around how to care plan around that. My question would be, "how hard are you trying," are you trying once, or are you coming back an hour later and trying again? Or do you just stop trying* (P33)*?"*
Quote 40	*"It's just a matter of staff practices and their own beliefs and where they came from, because keep it mind our staff is from all over. We're not just talking about here; we're talking about from other countries and what their experiences are with oral health. So, depending on where they are [from], were they able to brush their teeth every day? Or do they have to use something else? I know this sounds weird, but some places don't use a toothbrush; they use a sugar cane to brush their teeth, as an example. So, you do what you have to do, what is appropriate to where you are living or where you come from"* (P34).
Perceived Facilitators	
Quote 41	"*One* [resident]*... recognizes the toothbrush. You show him the toothbrush and tell him what you're gonna do. Sometimes just giving that little bit of a visual helps*" (P30).
Quote 42	"*This one fella we couldn't get his teeth out...and finally after 3 days we got them out*" (P30).
Quote 43	*"Sometimes, I will roll up a soft facecloth because I know that they want to bite on something, so I will get them to bite on the facecloth so that way I can pull their cheek and get in there and clean their mouth while they're biting on something. You have to kind of be creative. So, then it's not like they're going to bite down on your finger or something hard that could break their teeth"* (P34).
Quote 44	*"Even though it's* (mouth care) *gonna be done again, I still try to do it because I know that it's all in prevention" .... "I want to keep* [loved one] *on a regular maintenance routine as prevention, I want to prevent any oral health issues, decay, or pain, or anything like that"'"* (P36).
Perceived Benefits (DH)	
Quote 45	"*It is, without a doubt, one of the most important things. Obviously, I am a little bit biased, but it was one of the things going into long-term care and thinking, 'ok, how are we going to manage all these things,' and that's a big one because we know how quickly things can break down in the mouth, and*

	how quickly someone can get decay and end up with dental pain. It is absolutely so critical and important" (P36).
Perceived Benefits (OH)	
Quote 46	"*Oral health* [mouth care] [is] *the most challenging... sometimes it's the last thing that might get done, and I'll be honest, sometimes it gets missed*" (P2).
Cues to Action	
Quote 47	"*If their family is calling and saying, 'Hey, I came in, and I saw Mom's teeth weren't done.' If a person doesn't have that kind of family support, advocating on their behalf…They're not going to get as good of care as a person whose family is calling, checking in, wondering, questioning*" (P34).
Quote 48	*"That's the only way we check it for those who do it completely on their own. Like I said, we're not going to ask you if you brushed your teeth; we're past that stage"* (P34).

Table 1. Participants' Demographics (N = 41)

	%
STAFF PARTICIPANTS (n=34)	
Gender	
Female	85
Years in Current Position	
Less than one	14
One to five	26
Six to ten	34
Over ten	26
Age	
39 and under	35
40-49	23
50-59	29
60 and over	14
RESIDENT PARTICIPANTS (n-6)	
Gender	
Female	33
Age	
Under 84	50
85-90	17
90-95	17
Over 95	17
Years as Resident	
Less than one	33
One to two	50
Three or more	17

Source Demographic Questionnaires
Unpaid caregiver (n=1) is not included

Table 2. Descriptive Chart Documentation (N = 14)	
	Mean (SD)
Age (Years)	91.83 (±4.84)
Average Daily Oral Care Frequency*	1.26 (±0.23)
	%
Initial and Yearly Oral Assessment (No)	29
Complete Oral Care Plan (No)	79
One or More Days Without Care (No)	36
Resident Gender (Male)	57
Frailty Category	
Mild/Moderate	43
Severe	50
Missing Data	7
MMSE Category	
May be Normal/Mild	43
Moderate	21
Severe	29
Missing Data	7
Communication Status (Impaired)	50
Responsive Behaviours (No)	85
Denture Status	
No Teeth	7
Natural Teeth	36
Partial Dentures	21
Full Dentures	36
ADL Assistance	
Independent	14
Varies**	43
Dependent	29
Missing Data	14
Oral Care Assistance	
Independent	36
Assisted	21
Dependent	29
Missing Data	14
Source Retrospective Chart Review.	
*Based on data available from the previous month of documentation	

Table 3. Frequency of OH Chart Documentation (N=10)				
	Missing an initial or yearly oral assessment (%)	**Oral care plan is incomplete or missing (%)**	**Gone at least one day without oral care (%)**	**Frequency of oral care per day* (Mean)**
Frailty Category				
Mild/Moderate (n=5)	0	80	80	1.17
Severe (n=5)	40	60	60	1.22
MMSE Category				
May be normal/Mild (n=5)	80	80	80	1.17
Moderate/Severe (n=5)	20	60	60	1.22
Communication Status				
Impaired (n=5)	20	60	80	1.11
Not Impaired (n=5)	20	80	60	1.29
Responsive Behaviours				
Yes (n=2)	0	50	100	1.03
No (n=8)	25	75	63	1.24
Dentate Status				
No Teeth (n=1)	0	0	100	1.05
Natural teeth (n=2)	50	50	100	1.30
Natural teeth/ Dentures (n=3)	33	100	66	1.18
Full Dentures (n=4)	0	75	50	1.19
ADL Assistance				
Independent (n=2)	0	100	50	1.20
Varies by day/Dependent (n=8)	25	63	75	1.20
Oral Care Assistance				
Independent (n=5)	20	100	60	1.19
Assisted/Dependent (n=5)	20	40	80	1.20

Source Retrospective Chart Review. Four charts with missing data were excluded. Numeric data shown on this table indicates percentages and, when possible, the mean of the sample with the indicated variable of interest.
*Based on data available from the previous month of documentation

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