



HHS Public Access

Author manuscript

J Am Med Dir Assoc. Author manuscript; available in PMC 2021 June 07.

Published in final edited form as:

J Am Med Dir Assoc. 2021 June ; 22(6): 1190–1193.e2. doi:10.1016/j.jamda.2020.11.038.

Mouth Care in Assisted Living: Potential Areas for Improvement

Christine E. Kistler, MD, MASc^{a,b}, Jessica Scott, DHSc^c, Kimberly Ward, MPH^a, Robin Zeigler, BSDH^c, Louise Sullivan, PhD^d, Sarah E. Tomlinson, DDS^c, Christopher J. Wretman, PhD^{a,e}, Sheryl Zimmerman, PhD^{a,e,f}

^aThe Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

^bDepartment of Family Medicine, School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

^cDivision of Public Health, North Carolina Department of Health and Human Services, Raleigh, NC, USA

^dCollege of Nursing, Salve Regina University, Newport, RI, USA

^eSchool of Social Work, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

^fGillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

Abstract

Background: Poor oral care may lead to systemic disease, and there is evidence that assisted living (AL) residents lack quality oral care; in AL, poor care may be due to staff knowledge and attitudes, as well as organizational barriers to providing care.

Objectives: Determine AL staff knowledge and attitudes regarding mouth care and barriers to changing care

Design: Self-administered repeated-measures questionnaires completed before and after oral care training

Setting and Participants: 2,012 direct care staff and administrators from 180 AL communities

Methods: Nine knowledge questions and eight attitude and practice intention questions, and open-ended questions regarding training and obstacles to providing oral care

Results: Overall, 2012 participants completed pre-training questionnaires, and 1977 completed post-training questionnaires. Baseline knowledge was high, but staff were not uniformly aware of

Corresponding Author: Christine E. Kistler, School of Medicine, University of North Carolina, Chapel Hill, NC, USA, 590 Manning Drive, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599, Christine_Kistler@med.unc.edu, Office Number: 919.966.0543; Fax: 919.966.6126.

Authors' Contribution: Sheryl Zimmerman conceived the study; Jessica Scott, Robin Zeigler, and Sarah E. Tomlinson performed the study; Christopher Wretman and Kimberly Ward analyzed the quantitative data; Christine Kistler and Louise Sullivan analyzed the qualitative data; All authors contributed to the interpretation of the data and the development of the manuscript of the study. We also thank the assisted living communities and staff who participated in this project, for their dedication and efforts to quality care, and the UNC Cecil G. Sheps Center for Health Services for its support of this work. In addition, we would like to personally thank Debbye Krueger for her efforts in starting this project.

the systemic-oral link whereby mouth care impacts pneumonia and diabetes. Almost all staff reported learning a new technique (96%), including for residents who resist care (95%). Suggested areas to improve mouth care included having more hands-on experience. The primary perceived obstacles to care centered around residents who resist care and a lack of time.

Conclusions and Implications: Based on reports of having benefitted from training, AL staff overwhelmingly noted that new knowledge was helpful, suggesting the benefit of skills-based training, especially in dementia care. Mouth care in AL has been sorely understudied, and merits additional attention.

Brief summary:

We report on potential areas to improve oral care in assisted living residents.

Keywords

Oral Care; Mouth Care; Intervention; Assisted Living Communities; Educational Training

INTRODUCTION

Poor oral health leads to increased risk of systemic disease, including pneumonia.^{1,2} It worsens quality of life and increases pain, contributing to agitation among persons with dementia.^{3,4} Poor oral care is particularly prevalent in older adults who live in long-term care; in assisted living (AL), nearly half of residents have poor oral care.⁵⁻⁷

While numerous trials of oral care interventions have demonstrated improved oral hygiene and reduced gingival inflammation, and one -- *Mouth Care Without a Battle* -- reduced the incidence of pneumonia in nursing homes, few have targeted AL communities.⁸⁻¹¹ *Mouth Care Without a Battle* was developed for use in nursing homes, especially for residents with cognitive and physical impairment, and has been used in several state efforts to improve oral care.^{10,12} Because more than 40% of AL residents have dementia and at least moderate cognitive impairment, oral care training may be beneficial in this setting as well.¹³⁻¹⁵

In 2010, a Special Care Dentistry Advisory Group for the state of North Carolina (NC) identified older adults in AL communities as particularly at risk for poor oral care.¹⁶ In 2015, the NC Oral Health Section Leadership Team expanded oral care screening to AL communities. As a direct result of this work, an oral care training program was developed for direct care staff and administrators in NC AL communities that incorporated some components of *Mouth Care Without a Battle*. The aim of this manuscript is to present AL staff knowledge related to mouth care, how beneficial staff consider training to be, and potential avenues for improved care. Because the training program itself was in evolution (described below), this paper is not an evaluation of the program. Nonetheless, the results inform the importance of improving AL staff knowledge and attitudes and changing mouth care practices more broadly.

METHODS

Study Design:

We obtained data from staff in 180 AL communities before and after they attended an oral care training program informed by *Mouth Care Without a Battle* (January 2017 to September 2019). The NC Department of Health and Human Services deployed public health dental hygienists to provide statewide training and assess participant knowledge, attitudes, and practice intentions by way of a self-administered questionnaire using a cross-sectional repeated measures design. The project was exempt from NC Department of Health and Human Services IRB due to its focus on quality improvement.

Training.

Training initially consisted of a 50-minute didactic portion followed by a 10-minute practical learning session. Didactic information included the systemic health effects of poor oral care, common oral lesions, how to perform an oral examination, when to refer to a dental professional, and proper mouth care based on the resident's presentation; over time, the information was enhanced to include techniques for resistant residents. Participants then practiced brushing each other's teeth to gain perspective of how it feels to have someone else brush their teeth; this experiential component was omitted in 2018 due to budget constraints.

Setting and Participants:

The public health dental hygienist trainers distributed questionnaires to trainees at all 180 AL communities immediately before and after training. Participants were eligible for training if they were currently employed direct care staff, as well as AL administrators and directors.

Measures:

Participants completed questions about their oral care knowledge before and after training, and evaluated the benefit of training. Questions followed the Knowledge-Attitudes-Practice model of behavioral change.¹⁷ One item was added midway through the project (in 2018) -- "multiple medications cause dry mouth" -- resulting in a total of nine items. These knowledge questions were developed to reflect perceived knowledge and practice gaps based on prior experience and to reflect the content of the training program.

The second component of the questionnaire evaluated the training based on (1) content, (2) appropriateness to the individual's role, (3) how well the program met their needs, and (4) their overall satisfaction, on a 4-response Likert scale (poor, fair, good, excellent). They also responded to a 3-item yes/no section asking (1) did they learn new oral care techniques (and if yes, will they use what they learned), (2) did they learn new techniques for residents who resist care (and if yes, will they use what they learned), and (3) would they recommend the training to someone in their position.

In addition, participants responded to the open-ended question, "What do you see as obstacles to providing oral care to your patients?" Participants also hand-wrote responses to

three open-ended questions related to the training: the most valuable part, the least valuable part, and how the program can be improved.

Analysis:

Descriptive statistics were used to report knowledge and close-ended attitudes. To compare change in knowledge before and after training, because pre and post questionnaires could not be linked for some participants, primary analyses were conducted on the subset of participants with paired (pre- and post-training) data using a series of McNemar's exact tests assuming non-parametric distributions among the responses. Statistical significance was set at $p < 0.05$ (two-sided), and all data were analyzed using Stata 16.1 (StataCorp).

To analyze the hand-written responses to the four open-ended questions – which were largely short phrases provided by respondents – they were transcribed, and a “naïve” content analysis was conducted.^{18–20} The content analysis was “naïve” in the sense that it did not begin with a preconceived template of expected responses. Two investigators (CK and LS) reviewed all responses and independently identified domains that captured them. They were discussed among the research team, who were familiar with the data. The domains were then refined and revised based on iterative readings by the same investigators and agreed upon by the team. In this paper, example responses are selected to best represent the content of each domain. They were minimally edited for grammar correction.

RESULTS

In total, 2012 participants completed pre-training questionnaires, and 1977 completed post-training questionnaires. Of the 1670 respondents who reported a work role, most were personal care assistants (n=918, 55%), medication technicians (n=354, 21%), or other care provider (n=202, 12%), with the remainder being other supervisors (n=79), LPNs (n=42), RNs (n=41), or directors (n=34). All of these respondents could potentially have a role in mouth care.

Knowledge:

In general, initial participant knowledge was high, with 93%–98% answering 7 of 9 true/false statements correctly before the training; the items about the systemic-oral link where mouth care impacts pneumonia and diabetes were answered correctly by 77% of respondents before training, and 96%–97% after training (see Table 1, unpaired analyses). For the paired analyses, there was a 15% absolute increase in the number of correct responses to those statements. Follow-up sensitivity analyses on the sub-set of paired observations for participants who received training without a hands-on approach (July 1, 2018 onwards), found no meaningful changes to the pattern of significance differences among the 9 items.

Attitudes and Practice:

Almost all participants reported learning a new technique for mouth care (96%) and for resistant residents (95%), and of these, virtually all reported they would put what they learned into practice (96% and 98% respectively). Most participants (78%) rated the overall

program as “excellent”, with similar response rates for the appropriateness of the program to their role, how well the program met their needs, and overall satisfaction (77%, 77%, and 80%, respectively). Of 1914 participants, 1891 (99%) said they would recommend the training to someone in their position.

Perceived Obstacles and Value of Training:

In total, 1170 participants reported on the value of training, and 977 responded to the open-ended “obstacles” question. Content analysis identified ten domains, five of which related to obstacles: (1) attitudes about oral care, (2) procedures to provide oral care, (3) addressing resistant behaviors, (4) tools to provide oral care, and (5) systemic issues (see Table 2). The primary obstacles to care centered around residents with dementia and resisting care, although some responses mentioned lack of administrative or family support, or a need for supplies or time. In general, the oral care program was considered valuable in multiple ways, with an area for improvement being having more hands-on experience with products and actual AL residents (see Supplemental Table).

DISCUSSION

Different from oral health studies conducted in nursing homes, the aims of this study were to examine staff knowledge and attitudes regarding mouth care, and barriers to changing care, in AL. Results indicated that AL staff had high levels of knowledge before training, with 93% answering 7 of 9 questions correctly; through training, they gained additional knowledge about the link between oral health and systemic health (pneumonia and diabetes). Despite their generally high knowledge, attitudes regarding the training program were overwhelmingly favorable both for general and dementia-specific techniques, suggesting that training focused on techniques rather than knowledge may be beneficial (i.e., not *whether* dentures should be removed, but *how* to remove them); on that note, participants overwhelmingly felt they learned new techniques in both areas that they would put into practice.

This training program contained specific components of oral care for AL residents with dementia that appear particularly helpful. Because the frequency of agitation and other behavioral expressions of discomfort of AL residents approach the rates of NH residents with dementia, this finding is unsurprising.^{21,22} Ongoing issues around oral care refusal and agitation were common both in our data and in other work.²³ An older systematic review of interventions to reduce agitation in residents with dementia did not include any oral care training programs, although a more recent review has begun to find these interventions, demonstrating the increased attention and perceived need for oral care in long-term care.^{24,25} Targets to improve the training could include concrete tips on how to better engage AL residents with dementia with a focus on rapport building.^{9,26}

AL personal care assistants and medication technicians commented on the complexity of some of the practices and terms used; therefore, simplifying the steps in oral care delivery and using uniform and layman’s terms are indicated. Participants requested more hands-on training, which has been effective in NH populations.²⁷

As Volk *et al.* noted in their oral care training program, engagement of staff, administrators, and residents and their families may be the most important part of changing oral care.¹² Another oral care intervention in nursing homes found improved knowledge but no change in attitudes.²⁸ Management may play a vital role in supporting changed attitudes and care practices, as well as having local champions, as is promoted in *Mouth Care Without a Battle* and the *Brushing Up on Mouth Care* nursing home oral care training programs.²⁹ Other efforts include enlisting family support to reduce resident and staff conflict, which also is present in AL.^{30,31}

Our study has three key limitations. First, this intervention is not a definitive training program, because as noted, it evolved during its implementation and will continue to evolve; instead, the data are used to shed light on staff knowledge, attitudes, and obstacles to care. Also, data were not obtained to examine differences by racial group, age, geographic location, or other differences found to be important in other studies.⁶ Because this study is a convenience sample of participants, it is possible that other AL staff in a different sample of AL communities may have less pre-training knowledge, or different attitudes regarding training, or report different barriers to mouth care. It may be reasonable to assess AL staff knowledge prior to training and modify the training content depending on the baseline knowledge of the staff. However, given that training was found to be beneficial even in this group with high baseline knowledge, the utility of training AL staff to provide oral care seems incontrovertible. Lastly, while the quantitative questions were based on the Knowledge-Attitudes-Practice model of behavioral change,¹⁷ they cannot be considered a valid indicator of knowledge and attitudes due to the limited number of items and their lack of psychometric evaluation; future study is advised to use more robust measures.³²

Conclusions and Implications

Although oral care knowledge among AL staff was high at baseline, attitudes towards training were highly positive and participants overwhelmingly felt they learned new techniques. There is good justification to provide oral care training to AL staff, especially if it is skills-based. The optimal format and content of that training, and the extent to which such training changes actual care practices and resident outcomes, await further study.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGMENTS

Conflicts of Interest:

SZ is a co-principal in Generativity, LLC, which assists in dissemination of Mouth Care Without a Battle. SZ received grants from the National Institutes of Health during the conduct of the study. No other authors had conflicts of interest.

Sponsor's Role:

The sponsor, NIA R01 AG061966, had no influence on the design, methods, subject recruitment, data collections, analysis, and preparation of paper.

Funding source:

This work was funded by the National Institute of Aging (Grant R01 AG061966)

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Table 1.

Participants' correct oral care knowledge before and after training

Knowledge Items (True/False)	Unpaired (N = 860–2005)			Paired (N = 753–773)			p
	Before	After	Change %	Before	After	Change %	
	N (%)	N (%)		N (%)	N (%)		
Mouth care can impact pneumonia rates (True)	1522 (77.4)	1895 (96.8)	+19.4	627 (83.2)	742 (98.4)	+15.3	<.001
Diabetes is related to oral conditions (True)	1534 (77.6)	1877 (95.9)	+18.3	612 (80.3)	731 (95.9)	+15.6	<.001
Dentures should not be removed from the mouth (False)	1843 (92.5)	1854 (94.3)	+1.8	713 (93.2)	718 (93.9)	+0.7	.51
Mouth care is a part of infection control (True)	1856 (93.7)	1934 (98.6)	+4.9	726 (95.5)	753 (99.1)	+3.6	<.001
Dentures do not need to be cleaned (False)	1911 (95.5)	1891 (96.6)	+1.2	733 (96.2)	732 (96.1)	-0.1	1.00
Developing a personal relationship improves patient compliance (True)	1899 (96.1)	1933 (98.8)	+2.8	736 (97.5)	751 (99.5)	+2.0	.001
Oral conditions impact general health (True)	1955 (97.5)	1963 (99.8)	+2.3	768 (99.4)	772 (99.9)	+0.5	.22
Multiple medications cause dry mouth (True)	843 (98.0)	781 (99.6)	+1.6	737 (97.9)	750 (99.6)	+1.7	.001
Mouth care should be performed every day (True)	1962 (98.2)	1954 (99.5)	+1.3	761 (99.3)	762 (99.5)	+0.1	1.00

Note. Items reordered from original survey based on pre-training % correct (ascending). Change represents absolute change from baseline. *p* values test before v. after (paired) correct response using McNemar's exact test (two-sided). Not all questionnaires identified the respondent, preventing pre- v. post-testing comparisons for the entire sample.

Table 2.

Qualitative domains, definitions, and sample responses to “What do you see as obstacles to providing oral care to your patients?”

Domains	Definition	Sample Responses (Respondent)
<i>Attitudes about oral care</i>	The reason, philosophy, motivation, or goal of oral care, including its importance	<i>Staff willingness ... encouragement is still [the] biggest area. (Director)</i> <i>Staff compliance. (Med tech)</i>
<i>Procedures to provide oral care</i>	Procedural information such as how to open a resident’s mouth, keep teeth and dentures clean, or brush teeth	<i>Checking their mouth daily [is an obstacle]. (PCA)</i>
<i>Addressing resistant behaviors</i>	Addressing oral care for those with impaired cognition who resist care, including strategies for all stages of dementia, residents who bite down, and other types of resistance and combativeness	<i>Being bitten and having the patients actually let the person perform their care. (PCA)</i>
<i>Tools to provide oral care</i>	Knowledge about how to use an instrument or piece of equipment for oral care (e.g., angle toothbrush) or about how to use oral care products (e.g., Listerine Zero, biotene)	<i>Having the tools to provide more effective care. (PCA)</i> <i>Each resident having a personal kit. (PCA)</i> <i>Families providing what we need to assist with oral care. (Med tech)</i>
<i>Systemic issues</i>	Issues that do not involve specific oral care information, techniques, or devices; can be related to self or others	<i>Time management and short staffing issues. (No role listed)</i>

Med Tech= Medication technician; PCA= Personal care assistant