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Mouth Care in Nursing Homes: Knowledge, Beliefs, and Practices of Nursing Assistants

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Abstract

The purpose of this study was to examine the knowledge, beliefs, and practices of nursing assistants (NAs) providing oral hygiene care to frail elders in nursing homes, with the intent of developing an educational program for NAs.

Methods—The study occurred in two economically and geographically diverse nursing homes. From a sample size of 202 NAs, 106 returned the 19-item Oral Care Survey.

Results—The NAs reported satisfactory knowledge regarding the tasks associated with providing mouth care. The NAs believed that tooth loss was a natural consequence of aging. They reported that they provided mouth care less frequently than is optimal but cited challenges such as caring for persons exhibiting care-resistive behaviors, fear of causing pain, and lack of supplies.

Conclusion—Nurses are in a powerful position to support NAs in providing mouth care by ensuring that they have adequate supplies and knowledge to respond to resistive behaviors.

Nursing assistants (NAs) account for 65% of the nursing staff in nursing homes (NHs)^{1,2} and provide most of the physical care for frail, functionally dependent, and cognitively impaired elders. Older adults are at risk for oral health problems, and these problems can affect systemic health. The purpose of the study reported here was to collect and analyze data surrounding the knowledge, beliefs, and self-reported practices of NAs providing oral hygiene care to frail, functionally dependent, and cognitively impaired elders.

Background

Ninety-one percent of NH residents are aged 65 years or older; 46% are aged 85 years or older. Seventy-five percent require assistance with 3 or more activities of daily living (ADLs)^{1,2} showering/bathing (including oral care), dressing, and eating are the most common ADLs with which residents require assistance.^{1,2} Self-care is further compromised by cognitive impairment; 70% of NH residents exhibit some form of cognitive impairment regardless of diagnoses.

Older adults, especially the frail, functionally dependent, and cognitively impaired residents in NHs, are at risk for tooth loss from dental caries and periodontal disease. The average NH elder takes 8 medications daily.² Many medications commonly prescribed for elderly patients, especially calcium channel blockers and antiseizure medications, result in gingival overgrowth, which further predisposes the NH resident to caries and periodontal disease.^{3,4} Other medications, including anticholinergics, antihypertensives, antidepressants, diuretics, anxiolytics, and antihistamines, diminish salivary production and alter the ability of the oral environment to fight the effects of pathogens.^{3,4} Older adults may form plaque more quickly than their younger counterparts when oral care is not routinely performed; this may be due to gingival recession, which exposes more tooth to the oral environment and also to reduced salivary flow.³ Tooth loss may cause shifting of remaining teeth to the point where occlusal surfaces no longer articulate, interfering with chewing and swallowing functions and potentially resulting in malnutrition and weight loss.

There is emerging evidence that oral health affects systemic health.⁵ Poor oral health appears to increase the risk of poor nutrition,⁶ ischemic stroke,⁷ carotid atherosclerosis,^{8–10} poor glycemic control in diabetes,^{11,12} and NH-acquired pneumonia.^{13–20} However, despite the tremendous importance of oral health in frail, functionally dependent, and cognitively impaired NH elders, there is evidence that oral care is suboptimal. Many studies have documented the overall poor oral health of NH elders,^{13,21–25} especially those with dementia.²⁶ Inadequate daily oral care provided by caregivers was a significant factor for poor oral health.^{27–29} We embarked on this study to collect and analyze data surrounding the knowledge, beliefs, and self-reported practices of NAs who provide oral care to NH residents. Other oral health educational interventions designed for NAs did not assess their learning needs; consequently, those educational interventions showed no change in oral health outcomes.³⁰ We used the data collected in the survey to develop an educational oral care intervention designed to address the specific challenges faced by the NAs in this sample. The results of the survey are reported in this article.

Setting and Sample

After approval from the institutional review board, NAs were recruited from 2 NHs. NH1 was a 200-bed urban for-profit facility that received the majority of its reimbursement from Medicaid. NH2 was a 250-bed suburban not-for-profit facility that received the majority of its reimbursement from private-paying residents. NAs were approached during existing in-services during all shifts and weekends during a 30-day period. They were asked to complete the survey. Of a total combined population of 202 NAs, 106 returned the surveys

for a response rate of 52.5%. Characteristics of the NAs are reported in Table 1. The majority were female. The average time as an NA was 11 years (range: 2 months–30 years), and the average length of time working at the current NH was 5.5 years (range: 1 month–30 years). The NAs worked all shifts, but a majority worked either day shift ($n = 39$, 36.8%) or evening shift ($n = 38$, 35.8%). There were no statistical differences between sites for sex, length of time working as an NA, or duration of employment at the NH. The NAs who were employed at NH2 appeared to be better educated than their counterparts at NH1 because more NAs at NH2 had completed high school and had some type of college education. The difference between the 2 groups, although not statistically significant, did approach statistical significance (Pearson = .07).

Measurement and Methods

The Oral Care Survey measured the knowledge, beliefs, and self-reported practices of NAs who provided mouth care to frail and functionally dependent NH elders. The survey was a modification of one used by Grap et al.³¹ in their study of the oral care practices by nurses in intensive care units. Additional questions were added on the basis of findings in the literature. The final version of the survey contained 2 questions about oral care knowledge, 5 questions about oral care practices, 4 questions about oral care beliefs, 6 demographic questions, and 2 open-ended questions regarding challenges and topics for future oral care training programs (available by request from Jablonski). A 100-mm visual analogue scale (VAS) was used for 8 of the questions about oral care practices and beliefs. VASs have been successfully used in many clinical and research endeavors, and their validity and reliability have been extensively tested.^{32–34} These scales provide a reliable and valid method to quantify subjective experiences.

Knowledge was measured by 2 questions. The first question was open-ended, “At this nursing home, what is the routine for oral care?” The second question asked if the NAs knew whether their NH had a written policy for oral care.

Beliefs were measured by the following four questions: “Brushing and flossing daily prevent gum disease,” “Health of the mouth is related to health of the body,” “As people age, they naturally lose their teeth,” and “Dentures should be removed at night.” The first 3 questions had previously been developed and tested by Pyle and colleagues³⁵; 2 supported the construct of value of oral health and 1 reflected a common myth about aging and dentition.³⁵ The fourth question was added about denture removal at night because previous researchers had noted a knowledge deficiency in this area.³⁶ The anchors used for these 4 questions were “Disagree” and “Agree.” A sample VAS is provided in Figure 1.

Practices were measured by 5 questions. The first of the 5 questions required respondents to select, from a list, how many times a day they provided mouth care. The remaining 4 questions required respondents to rate on a VAS the frequency they used specific mouth care products (mouthwash, normal saline, toothpaste, peroxide mixture, prescription mouth wash, or other) for NH residents with varying types of dentition (“own teeth,” “own teeth and dentures,” “dentures with no natural teeth,” “no natural teeth and no dentures”). The anchors

for these VASs were “0” and “100% of the time.” An example of one of the questions with the VAS is shown in Figure 2.

The last 2 questions, “What are the challenges you face when you give oral care” and “What topics would you want to hear about if you were able to attend a training program about oral care” were included in order to help us develop an appropriate oral care educational intervention for the NAs who completed the surveys.

We tested the Oral Health Survey for readability and ease of administration on a sample of 15 NAs from northern Virginia. Based on their feedback, the survey was modified as follows: the VASs were divided into 10-mm increments, and some of the questions were reworded for readability. The second version of the Oral Health Survey was tested again with a different group of 15 NAs, who offered no additional suggestions for improvement.

Surveys were distributed to all NAs attending scheduled in-services provided by the facility. The research team was granted access to the NAs during these times; we explained the purpose of the study and requested that the NAs complete the survey. We did not conduct any oral care educational programs during these scheduled times. Quantitative data from the returned surveys were analyzed using descriptive statistics and *t* tests run by the statistical software JMP 7.0 (SAS; Cary, NC; 2007). Data from open-ended questions were organized into themes.

Results

The questions on the Oral Care Survey for NAs comprised 3 areas: knowledge, beliefs, and self-reported practices. Knowledge was measured using 2 questions, 1 about the routine for oral care and 1 about the presence or absence of a written mouth care policy. When asked to describe the routine for oral care in their facility, 79 provided responses that fell predominantly into 1 of 2 categories: timing (e.g., “upon awakening,” “before bedtime”) and task (e.g., “use a toothbrush”). Only one respondent wrote about the use of warm water for rinsing, and only 1 mentioned flossing. In response to the second knowledge question, “The nursing home has a written policy for oral care,” 79 of the NAs completing the survey believed their NH had a written policy for oral care. Ten did not believe their NH had such a policy, and 17 left the question blank.

Beliefs were measured by 4 questions listed in Table 2. Respondents were asked, using the VAS, how much they agreed or disagreed with each statement. Higher numbers were associated with agreement, lower numbers with disagreement. Generally, NAs believed that brushing and flossing prevented gum disease, that oral health was linked to systemic health, and that dentures should be removed at night. Their views regarding tooth loss and aging were more polarized. When we examined the distribution of scores for this statement, we noted that 51 of the 101 respondents who answered this question provided a score of 90 or higher on the VAS. There was no correlation between education level and VAS score and no difference between NAs at either NH. In other words, nearly half of the NAs regardless of educational level or NH site were inclined to agree with the statement, “As people age, they naturally lose their teeth.”

Table 3 lists the responses that NAs provided to the questions designed to elicit information regarding their self-reported practices. Forty-four reported that they performed mouth care daily, 28 reported that they performed mouth care twice daily, and 21 reported that they performed mouth care 3 times a day. Toothpaste, mouthwash, and commercial denture cleaners were the most frequently used items regardless of dentition. For dentate NH residents, toothpaste was the most popular item used for oral care (68.4%), followed by mouthwash (60.1%). When caring for NH residents who had both natural dentition and dentures, NAs reported that they used toothpaste and mouthwash most often as well as commercial denture cleaner. NH residents who wore only dentures received mouthwash 65.3% of the time, toothpaste 47.7% of the time, and commercial denture cleansers 63.0% of the time. NAs reported that they used mouthwash 70.2% of the time and toothpaste 30.1% of the time when providing oral care for NH residents with neither dentition nor dentures. NAs also reported that they used “other” products nearly a quarter of the time regardless of the type of dentition. NAs also indicated that they used commercial denture cleaner 13.5% of the time for persons who did not wear dentures.

The last 2 questions were designed to help us develop an appropriate oral care educational intervention for the NAs. When asked about challenges associated with providing mouth care, 3 major themes emerged: care-resistive behaviors, fear of causing pain or injury, and lack of supplies. When discussing care-resistive behavior, 1 respondent noted, “Most residents refuse mouth care. It’s hard to clean their mouth when they will not open their mouth or when they bite you.” Another responded that resistive behavior included “having patients spit and even vomit on you.” NAs were fearful of inadvertently causing pain when providing oral care because “sometimes residents feel pain on their gums and that makes them not willing to have them cleaned. But, with regular cleaning, the pain goes [away].” Many were concerned about causing gums to bleed or residents swallowing mouthwash. NAs wrote about the shortage of supplies such as denture tablets. When questioned about potential topics for future educational programs, the major theme “best mouth care under difficult circumstances” emerged: “What can we do for residents who refuse oral care?” “I would like to hear about how to give proper care when patients close their mouths and resist.”

Discussion

The purpose of this study was to examine the knowledge, beliefs, and practices of NAs providing oral hygiene to frail elders to design an educational intervention on the basis of their responses. According to their responses, the NAs possessed adequate knowledge regarding the minimum amount of oral hygiene necessary for frail and functionally dependent elders. They knew that mouth care should be provided, at a minimum, twice daily.

The NAs believed that brushing and flossing prevented gum disease, that oral and systemic health were related, and that dentures should be removed every night. These results were similar to the ones reported by Pyle et al.,³⁵ although those researchers used a 4-point Likert-type scale, and we measured agreement using VASs. Pyle et al. noted that 36% of their respondents either agreed or strongly agreed with the myth that tooth loss is a natural

consequence of aging. Nearly half of our respondents, however, had VAS scores of 90 or higher, indicating a propensity to agree with the myth. Additional research is required to determine the reason for this difference.

In regard to practices, the NAs reported that toothpaste, mouthwash, and denture cleaner were most often used for oral care regardless of dentition. One disconcerting finding was the report that NAs used toothpaste 68.4% of the time for residents with teeth. NAs also reported only using toothpaste 47.7% of the time for residents with dentures only. Toothpaste can abrade denture surfaces. This finding is also problematic, given that plaque can readily collect on dentures and harbor harmful pathogens.^{18,19} The answers that the NAs provided to the question regarding the challenges of providing mouth care may offer insight into these results: lack of supplies. NAs may only be using toothpaste 68.4% of the time because it is only available two thirds of the time. The final finding that we question is the use of denture cleansers for persons without dentures. This may be the result of the way the VAS was organized, which may have increased the probability of NAs inadvertently misreading or misinterpreting the question.

NAs' reported practices did not correspond to their knowledge. Despite their knowledge that mouth care should be provided at least twice daily, 44% reported that they performed mouth care only once a day. Hardy and colleagues reported in 1995 that 26% of the surveyed NAs reported brushing teeth for NH residents once daily, and 21% reported brushing teeth twice daily.³⁷ Our numbers may be higher because we included all mouth care, not just tooth brushing. We believe that the reasons for differences between knowledge and practice were elucidated in the themes identified from the last 2 questions of the survey. When faced with care-resistive behaviors, lack of supplies, and the possibility of inadvertently causing pain or injury, NAs may perform mouth care less frequently than they wish. Other researchers have found that uncooperative NH residents, staffing, and lack of time contributed to the lack of mouth care provided by NAs.^{38,39} Interestingly, our sample did not identify lack of staffing or lack of time as challenges they encountered when providing mouth care.

One limitation of the survey was the use of the VASs. We were unable to locate studies in which NAs were asked to complete VASs. We employed this method to provide a reliable and valid method to quantify subjective experiences. The use of VASs to measure the frequency of use for mouth care products may be inappropriate in an environment where the products may be in short supply, thus skewing the results. The use of VASs to measure the degree of one's agreement or disagreement with a statement may be more appropriate. Thus some of the NAs may have had difficulty responding to specific VAS questions despite verbal explanations before the completion of the survey. Their difficulty with the VASs may ironically have contributed to more categorical or dichotomous responses instead of continuous responses. The use of the VAS also made comparisons with other reported findings challenging. Another limitation of the survey was the lack of distinction between mouthwash with fluoride and mouthwash without fluoride. Other researchers have reported the use of both by NAs.^{37,38} NAs may also have had problems distinguishing between the categories of products listed in the survey. Finally, this survey relied on the self-report of NAs. One recent study found discrepancies between the actual and reported mouth care provided by NAs.⁴⁰ More research is needed in this area.

When examining the findings of the survey as a whole, we noted that an educational intervention based on specific methods to help NAs provide mouth care to persons exhibiting care-resistive behaviors would be beneficial. We developed an educational program that used interventions rooted in the Need-Driven Dementia-Compromised Behavior Model⁴¹ and implicit memory theory.⁴² The basis of the program is that care-resistive behavior is often the resident's way of communicating fear, discomfort, or misinterpretation of the NAs intent. By changing how the NA approaches the resident, the NA may find less care-resistive behaviors when providing mouth care—or any other care activity. The educational program summarized best oral care practices, addressed common myths associated with aging and oral health, and provided concrete person-specific strategies both to help NAs prevent care-resistive behaviors and to deescalate care-resistive behaviors while providing mouth care. We are currently re-fining the educational program and plan to test the program on larger samples of NAs in geographically diverse areas.

Conclusion

Mouth care is an important part of the self-care needs of institutionalized older adults. Nurses are in a powerful position to guide NAs and help them by modeling behavior—that is, by demonstrating techniques that minimize both care-resistive behaviors and functional dependency. For example, implicit memory is the ability to automatically complete a task learned in childhood if appropriately cued, and it remains intact even in very late stages of dementia.⁴² An NA who tries to brush an elder's teeth may encounter care-resistive behaviors and may be unwittingly increasing dependency, creating a negative spiral of continued care resistiveness and dependency. However, an NA who is shown how to cue the elder by putting the toothbrush in his or her hand and pantomiming the act of brushing may be more successful in promoting good mouth care while preserving the elder's functional abilities. Nurses can also improve the environment of mouth care by ensuring that NAs have sufficient quantity and quality of supplies to administer care. This study represents one step toward addressing some of the problems faced by NAs who wish to provide excellent mouth care to their NH residents.

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Brushing and flossing the teeth daily can prevent gum disease.

Disagree |-----|-----|-----|-----|-----|-----|-----|-----|-----| Agree

The health of the mouth is related to the health of the body.

Disagree |-----|-----|-----|-----|-----|-----|-----|-----|-----| Agree

As people age they naturally lose their teeth.

Disagree |-----|-----|-----|-----|-----|-----|-----|-----|-----| Agree

Dentures should be removed at night.

Disagree |-----|-----|-----|-----|-----|-----|-----|-----|-----| Agree

Figure 1.

Questions measuring beliefs using VAS from the Oral Health Survey.

Figure 2.
Example of a reported practice question visual analogue scale from the Oral Care Survey.

Table 1

Comparison of Nursing Assistant (NA) Demographic Information by Nursing Home

Demographic Information	NH1 N = 30, % (Mean ± Standard Deviation)	NH2 N = 76, % (Mean ± Standard Deviation)	Significance
Gender			
Male	3.3%	7.0%	Pearson = .48
Female	96.7%	93.0%	
Years Experience as an NA	(9.4 ± 4.9)	(11.6 ± 9.3)	<i>P</i> = .13
Years Experience in current NH	(4.1 ± 4.2)	(6.0 ± 8.2)	<i>P</i> = .15
Education *			
Started high school	10.4%	9.2%	Pearson = .07
Completed high school	31.0%	40.8%	
Started technical training	6.9%	0	
Completed technical training	27.6%	12.7%	
Started college	17.2%	22.5%	
Completed college	3.4%	11.3%	
Started post-college	3.4%	0	
Completed post-college	0	2.8%	

* Totals do not add up to 100% because of rounding.

Table 2

Beliefs of NAs Regarding Oral Health

Statement	N	Mean	Standard Deviation
"Brushing and flossing daily prevent gum disease"*	97	93.3	17.2
"Health of mouth is related to health of body"*	95	87.9	24.9
"As people age they naturally lose their teeth"*	101	60.6	38.1
"Dentures should be removed at night"	101	93	21.4

* Reproduced from Pyle MA, Nelson S, Sawyer DR. Nursing assistants' opinions of oral health care provision. *Special Care in Dentistry*. 1999;19(3):112–7. Written permission received from MA Pyle and Special Care in Dentistry to reproduce questions.

Table 3

Self-reported Practices of NAs Regarding Oral Care

Question	Responses (Percentages)
In general, how often do you perform oral care for your residents?	Daily: 44 (41.5%) Twice daily: 28 (26.4%) Three times daily: 21 (19.8%) Four or more times daily: 5 (4.7%) Missing responses: 8 (7.5%)
Questions (Using Visual Analogue Scales for Frequency)	Mean (SD)
In general, how often do you use these products for oral care for your residents with their own teeth?	Mouthwash: 60.1% (27.1%) Normal Saline: 14.0% (23.3%) Toothpaste: 68.4% (29.8%) Peroxide Mixture: 15.0% (27.4%) Prescription Mouthwash: 18.8% (30.4%) Other: 18.8% (30.4%)
In general, how often do you use these products for oral care for your residents with their own teeth and dentures (full or partial plate)?	Mouthwash: 65.4% (28.6%) Normal Saline: 15.7% (26.3%) Toothpaste: 67.8% (32.3%) Peroxide Mixture: 17.1% (28.1%) Prescription Mouthwash: 25.3% (32.8%) Commercial Denture Cleaner: 57.2% (37.5%) Other: 22.3% (33.0%)
In general, how often do you use these products for oral care for your residents with dentures but with no natural teeth?	Mouthwash: 65.3% (32.0%) Normal Saline: 13.8% (24.2%) Toothpaste: 47.7% (37.9%) Peroxide Mixture: 13.4% (25.6%) Prescription Mouthwash: 24.4% (33.3%) Commercial Denture Cleaner: 63.0% (38.9%) Other: 25.5% (32.5%)
In general, how often do you use these products for oral care for your residents with no natural teeth and no dentures?	Mouthwash: 70.2% (31.3%) Normal Saline: 17.1% (29.4%) Toothpaste: 30.1% (36.6%) Peroxide Mixture: 13.2% (26.3%) Prescription Mouthwash: 23.1% (33.1%) Commercial Denture Cleaner: 13.5% (28.9%) Other: 27.0% (35.8%)