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Profile of Nursing Home Residents With Dementia Who Require Assistance With Mouth Care

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Abstract

The majority of nursing home residents require assistance with activities of daily living, including oral care. Poor oral health is common in the nursing home because residents are not given appropriate assistance to support this aspect of their care. The purpose of this study was to describe the demographic, functional and behavioral profile of nursing home residents with dementia who require verbal or physical assistance with mouth care. Residents who required verbal support to complete mouth care exhibited higher levels of physical function, higher levels of cognitive functioning in the domains of language and executive function, lower levels of passivity, and higher scores for the personality trait of openness than residents who required physical assistance. Best practices for implementing verbal and physical assistance during mouth care to persons with dementia are presented based on these profiles.

Keywords

Dementia; mouth care; nursing home; functional abilities

Introduction

The majority of nursing home (NH) residents require assistance with activities of daily living, including mouth care.¹ Nursing assistants (NAs) are the primary providers of mouth care in NHs. NAs are often unaware of the importance of mouth care, are unable to identify those residents in need of assistance to perform adequate mouth care, or lack the skills needed to provide adequate verbal or physical assistance when care resistance is exhibited.² The purpose of this study, therefore, is to describe the demographic, functional and

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behavioral profile of nursing home residents with dementia who require verbal or physical assistance with mouth care. This paper also presents best practices for implementing verbal and physical assistance during mouth care to persons with dementia based on these profiles. The identification of residents who are at risk of oral health neglect will raise awareness of the problem and help staff implement daily mouth care in a manner that preserves resident function and health.

Background

Throughout the past three decades, the oral health of nursing home (NH) residents has worsened as a consequence of inadequate mouth care.³⁻⁶ Oral health in NHs has been described as “deplorable,”⁷(p251) with evidence that “a high proportion of elderly nursing home residents suffer from poor oral hygiene and oral health neglect.”⁶(p100) The trend toward worsening oral health among NH residents is complicated by the rising numbers of persons entering NHs with some or all of their natural dentition; over half of all NH residents are dentate.⁸ Resources necessary for maintaining oral health are limited in this population--Medicare does not cover routine dental care; and Medicaid coverage varies among states but either does not cover dental care or compensates dentists so poorly that few will accept it.⁹ Thus, residents, especially those with dementia, require meticulous daily mouth care because they often lack access to routine dental care. Older adults form plaque more quickly than their younger counterparts when mouth care is not routinely performed; this may be due to gingival recession, which exposes more tooth to the oral environment, and reduced salivary flow.¹⁰ Tooth loss from periodontal disease causes the remaining teeth to shift to the point where occlusal surfaces no longer articulate, interfering with chewing and swallowing functions and placing residents at risk for malnutrition.¹¹ Sub-optimal mouth care is among the most common risk factors for aspiration pneumonia; resolving the problem of mouth care could have prevented 21% of all aspiration pneumonia cases in one NH sample.¹² Other systemic diseases associated with inadequate mouth care and resulting poor oral health are diabetes^{13, 14} and coronary artery disease.¹⁵⁻¹⁷ Deficient oral health negatively impacts quality of life and mortality, as well.¹⁸

Several variables have been associated with poor oral health. Age is one of the highest risk factors for poor oral health, with older adults more likely to have periodontal disease and to be edentulous than younger adults.^{19, 20} In studies of community-residing adults, researchers found associations between the lack of post-secondary education and indicators of poor oral health such as edentulism,¹⁹⁻²¹ caries,^{20, 21} and periodontal disease.^{19, 20} Persons dependent on others for activities of daily living were also more likely to have poor oral health.²² Persons with cognitive impairments had higher levels of dental plaque and gingivitis than those without cognitive impairments;²² persons with both dementia and the need for oral hygiene assistance had the highest amounts of dental plaque and gingivitis.²² Furthermore, in this population, personality traits, particularly neuroticism, have been associated with the ability to care for oneself²⁷ and the tendency toward cooperation in personal interactions.²³ A relationship between the personality trait of low agreeableness and aggression/agitation in persons with dementia has been demonstrated in several studies.^{24, 25} Agitated behaviors, as well as passivity,²⁶ have the potential to interfere with caregiver and self-care.

Given the general state of mouth care in the NH, this exploratory study used data from a randomized clinical trial (RCT) to identify characteristics of residents who were assessed as needing verbal or physical assistance with mouth care. The characteristics selected for exploration were based on the literature and variables available in the parent study. These included: demographics (particularly age and education);^{19, 20, 27} cognitive function, and overall ability to perform ADLs;²² behaviors that interfere with mouth care including agitation and passivity;^{2, 9, 28-30} and premorbid personality traits.³¹

Methods and Measures

Design

Baseline data from a randomized clinical trial that tested the efficacy of a tailored activity intervention for responding to behavioral symptoms in NH residents with dementia were used to address the aim of this project. The parent project received approval from the University Institutional Review Board (IRB). The methods and procedures used in that study have been described previously.³² The following is a brief summary of the protocol.

Setting and Sample

One hundred and twenty eight participants were recruited from nine community-based NHs located in Central and Northeast Pennsylvania. Potential participants were screened by a research nurse and/or a certified recreational therapist to establish eligibility for the study. All participants had a diagnosis of dementia according to DSM IV criteria and met all other inclusion and exclusion criteria: English speaking; 65 years of age or older; a score of 8 or greater but less than 24 on the Mini-mental State Exam;³³ no new psychoactive drugs prescribed from baseline through final observation; no delirium or progressive, unstable medical, metabolic, or neurological illness; no history of Parkinson's disease, Huntington's disease, seizure disorder, stroke, alcoholism, drug abuse, head trauma with loss of consciousness, or psychiatric illness preceding the onset of memory loss.

Procedures

Participants had moderate to severe cognitive impairments; therefore we obtained written consent from the legally authorized representative (LAR) and daily assent from the participant, per our IRB approved protocol. Participants who met enrollment criteria and whose LAR consented to participation were entered into the baseline phase of the trial. Baseline measures were obtained by trained research personnel using: a medical chart review (demographic data); resident interview (cognitive function); family interview using the NEO Personality Inventory (personality);²³ a functional assessment of activities of daily living (ADL), including mouth care; and behavioral observation over 5 days using video tapes of two twenty minute daily sessions, scheduled when the behavioral symptoms of agitation and passivity were most prevalent. The time of behavioral observation was determined in a pre-baseline period where subjects were observed every hour for 5-minutes (7am to 7pm) for three days using the Cohen-Mansfield Agitation Inventory (CMAI)³⁴ and the Passivity in Dementia Scale (PDS).³⁵ Each subject's high behavioral symptom time was identified by visually inspecting these data.

Measures

Demographic data extracted from the medical chart included age, gender, race and years of formal education. Cognitive function was measured using the MMSE, a 30-item standardized cognitive screen (scores = 0–30) with test-retest reliability (24 hours) of .83.³³

Agitation was measured from video tapes of observational sessions by blinded research assistants using the Cohen-Mansfield Agitation Inventory (CMAI).³⁶ The CMAI is a questionnaire that consists of 29 behaviors, modified for direct observation.³⁷ Higher scores indicate greater agitation. We obtained an inter-rater reliability (ICC) of .64 for the CMAI.

Passivity was measured from video tapes of observational sessions by blinded research assistants using the Passivity in Dementia Scale (PDS),³⁵ an observational scale consisting of 40 behaviors: 11 passive items that are scored in the negative and 29 active items that are scored in the positive. The PDS is comprised of 5 subscales related to specific behaviors: thinking, emotions, interacting with the environment, interacting with people, and activities.

Lower scores indicate greater passivity. We obtained an interrater reliability (ICC) of .79 for the PDS.

Personality was measured using Form R of the Revised NEO Personality Inventory (NEO-PI-R),²³ a 240-item Likert-type scale adapted for observer ratings. The NEO-PI-R allows a comprehensive assessment of adult personality in the five domains of neuroticism, extraversion, openness, agreeableness, and conscientiousness and the six more specific facets that comprise each domain. Coefficient alphas for observer ratings on the domain scales range from .86 to .91. A knowledgeable informant (usually a spouse or adult child) provided personality data.

Mouth care was scored by trained research assistants using the Psychogeriatric Dependency Rating Scale (PGDRS), a 7-item Likert-type scale that includes items on hearing, vision, mobility, dressing, toileting, speech and hygiene (including mouth care).³⁸ Mouth care was scored as: verbal assistance or physical assistance required. Verbal assistance with mouth care included cues, prompts, and reminders. Physical assistance with mouth care was selected if the caregiver actively completed the activities of daily living, including oral care. The PGDRS, including the mouth care item, was scored by the research assistant following an observational period of the ADL functions and interview with the nursing staff who cared for the resident. The PGDRS has an internal consistency of .94, interrater reliability of .87, and convergent validity with independent measures of nursing time demanded ($r = .72$). Higher scores on the PGDRS indicate greater dependency.

Analyses

Measures from both direct observation and video recordings were used in the analyses. All statistical analyses were conducted using SAS® statistical software, release 9.2 (copyright 2002–2008 by SAS Institute, Inc., Cary, NC, USA). Assessment of the mouth care items on the PGDRS were used to classify subjects into “physical” and “verbal” response groups. Descriptive statistics were calculated as means and standard deviations for continuous variables and counts and percentages for gender. Mean values of age, years of education, MMSE, PGDRS, NEO scales, and average CMAI total score and PDS scale scores were compared between the groups using t-tests. Subscale scores for the CMAI (aggression, 11 items; non-physical agitation, 7 items; and verbal agitation, 6 items)³⁴ were compared between the groups using the Mantel-Haenszel chi-square test for trend. In addition to the total score on the MMSE, scores on items that capture specific cognitive domains represented on the MMSE that have the potential to affect self-care were compared: language (5 items; range= 0 – 8) and executive function (1 item; range= 0 – 1). Language scores were compared between the groups using t-tests. The dichotomous executive function variable was compared between the groups using Fisher’s exact test. Proportions in each response group were compared between males and females using chi-square statistics. Additionally, all continuous variables were compared between the groups using analysis of co-variance, controlling for MMSE.

Results

We initially approached 196 potential participants who were identified by the nursing home as having dementia and the presence of behavioral symptoms. Twenty-eight refused screening. Of the 168 individuals who underwent screening, 40 did not meet enrollment criteria. The 128 study participants who met all enrollment criteria and consented were primarily female (77%), Caucasian (88%), with a mean age of approximately 85 years, a mean MMSE of 14.2 (sd= 4.4) and nearly 12 years of formal education. All participants required some form of assistance with oral care: 68 required verbal assistance and 60

required physical assistance. Table 1 lists the profile of study participants' characteristics by assistance group (verbal vs. physical) controlling for MMSE.

Participants in both groups were similar in age, gender, agitation levels, and the traits of neuroticism, extraversion, agreeableness and conscientiousness. Groups differed significantly in cognitive function as measured by the MMSE (verbal assistance, 15.6; physical assistance, 12.6; $p=0.0002$). Additionally, the group who required verbal assistance only had significantly better language skills ($p<.0001$) and executive function ($p=.0008$). After controlling for MMSE, we found that participants who required verbal assistance tended to have slightly more years of formal education than those who required physical assistance, although the results were not statistically significant (12.8 years versus 11.6 years, $p=0.07$).

In terms of ADLs, participants requiring verbal assistance exhibited much greater overall functional capacity than those requiring physical assistance (7.6 versus 12.1, $p<0.0001$). Passivity was a key factor in discriminating those requiring physical assistance to complete mouth care from those requiring only verbal support. Participants requiring physical assistance were more passive than their counterparts in the areas of thinking, emotions, interacting with people, and activities.

The only difference in personality traits between those requiring verbal assistance with mouth care and those requiring physical assistance was in the trait of openness. Participants who required verbal assistance were more open to ideas or experiences than those who required physical assistance.

Discussion

The purpose of this study is to describe the demographic, functional and behavioral profile of NH residents with dementia who require verbal or physical assistance with mouth care. In our study, we found that the NH residents who required verbal assistance with mouth care had higher levels of cognitive functioning overall and in the domains of language and executive function, greater capability to perform ADLs, less passivity, and higher levels of openness than residents who required physical assistance. There were no differences in age, gender, levels of agitation, or other personality traits between the groups.

The finding that participants with higher levels of cognition and ability to perform overall ADLs would require verbal assistance, as opposed to physical assistance with mouth care is not surprising and is congruent with existing research reports.^{22, 39, 40} As dementia progresses, the capacity for self-care diminishes.⁴¹ Persons with higher cognition levels are usually more adept at understanding and processing verbal cues than those with lower cognition levels.⁴² This was reflected in the higher language skills of those in the verbal assistance group. This group also demonstrated greater levels of executive function, a cognitive function that is needed for initiating and carrying out oral self-care.

Participants requiring verbal assistance had significantly higher scores for the personality trait of openness. One explanation for this finding is that higher levels of the personality trait of openness could make these participants more open to accepting direction in the form of verbal support and suggestions. Providing verbal support, as opposed to physically completing mouth care for the person with dementia, is congruent with research that supports promoting as much self-care as possible. Galik, Resnick, and Pretzer-Aboff⁴³ identified strategies to retain existing functional strengths, and avoid forced dependence, by capitalizing on residents' remaining physical function. These strategies could be applied to the provision of mouth care for those residents who can complete oral care with verbal

guidance by providing mouth care in front of a sink, setting up the mouth care supplies, and using short, one-step commands.

On the other hand, the group requiring physical support with mouth care was highly passive when interacting with people and activities and had fewer language and executive function skills. Given this profile, the group requiring physical assistance with ADLs would not be likely to initiate actions or understand verbal directions for completing the task of oral self-care. For residents fitting this profile, the goal of care would be to provide the least amount of physical support necessary. Specific interventions for providing mouth care to this group might include the nonverbal techniques of gesturing and pantomiming because they do not rely on language.²⁸ Given the lack of executive function, an intervention known as chaining, in which the caregiver starts the action (such as brushing teeth) and assists the resident with completing the activity,⁴⁴⁻⁴⁷ may also be helpful and has the potential to preserve existing functional abilities.

One surprising finding was the similar levels of agitation between the groups. Agitation is evident in persons with mild dementia and increases with moderate dementia before waning as the dementia progresses to severe.⁴⁸ We had expected to see higher levels of agitation in the group requiring physical assistance because of prior findings in the literature showing associations between lower levels of functional abilities and agitation.^{49, 50} Agitation is a significant barrier to care.⁴³ However, in this study agitation was observed at times outside of direct care activities, a limitation of the findings.

There are several limitations of this study. First, the study is a secondary analysis of data obtained from a randomized clinical trial. There were no measurements of the oral health status, so investigators were unable to determine if the level of assistance received by participants was effective. Additionally, the behavioral measures (agitation and passivity) were taken outside of direct care interactions. Had the behavioral measures been collected during direct care interactions, the additional data may have shown, for example, differing levels of agitation for persons receiving verbal or physical assistance.

Despite these limitations, the findings from this exploratory study provide initial guidance for improving the delivery of mouth care to residents with dementia and the design of future research in this area. Assessment of specific cognitive domains, such as language and executive function, may help practitioners discriminate between those residents who have the skills needed for responding to verbal cues and initiating oral self-care and those residents who will need physical assistance to maintain their oral health. Having a more open personality, information that can be gleaned from family members, may be useful in the identification of the residents who are more likely to respond to suggestions and cues for completing the task of mouth care. The assessment of functional, cognitive and behavioral profiles may improve the precision of care prescription (i.e. verbal guidance vs. physical assistance) thereby helping residents retain remaining abilities for the longest time possible.

Future studies that use a prospective design in which functional, cognitive, and behavioral measures are collected during actual oral care interactions, may shed light on the relationships between oral health, agitation and needed level of assistance. More precise measures of executive function and language could be combined with measures of personality to determine ideal levels of assistance. Well-targeted verbal support and physical support protocols should demonstrate positive outcomes such as improved functional abilities, oral health, and behavior. Additional studies may explore ranges of assistance during oral hygiene instead of dichotomous ones; these studies can potentially determine the best matches between specific levels of cognition, personality traits, and levels of assistance

along a continuum. These studies have the potential to eliminate “trial and error” on the part of the caregiver.

Conclusion

The provision of mouth care is an important nursing function. NH residents with dementia require meticulous mouth care because of changes associated with aging, diminished salivary flow, and lack of access to routine dental care. Inadequate mouth care has systemic repercussions in the form of pneumonia and cardiovascular disease. The findings from this study can help nurses to first identify which NH residents would benefit from verbal guidance or physical assistance, and then to determine which behavioral techniques to use to provide mouth care while maintaining existing functional and cognitive functions.

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Table 1
 Profile of Subjects by Type of Assistance Needed for Completion of Mouth Care Controlling for MMSE

Variable	Verbal Assistance			Physical Assistance			p-value
	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	
Age	68	85.8 (5.8)	60	86.5 (6.3)			0.72
Years of Education	68	12.8 (3.0)	60	11.6 (3.2)			0.07
Gender (Female, actual and percent)	50	73.3%	48	80.0%			0.39
MMSE	68	15.6 (4.3)	57	12.6 (4.1)			0.0002
• Language		6.85 (1.26)		5.77 (1.46)			<0.0001
• Executive function ¹		18%		0%			0.0081
Functional Status (PGDRS Scale)	68	7.6 (4.6)	60	19.1 (4.7)			<0.0001
Agitation (CMAD)	68	1.8 (2.0)	60	2.2 (2.2)			0.60
• Aggression		0.04 (0.13)		0.04 (0.11)			0.94
• Nonaggression		1.45 (1.89)		1.93 (2.05)			0.17
• Agitation		0.26 (0.72)		0.21 (0.57)			0.68
Passivity (PDS), Thinking	68	5.5 (2.1)	60	3.7 (2.0)			0.0003
Passivity (PDS), Emotions	68	4.2 (2.6)	60	2.3 (2.3)			0.0021
Passivity (PDS), Interacting with Environment	68	1.4 (1.1)	60	1.3 (1.1)			0.96
Passivity (PDS), Interacting with People	68	7.6 (3.0)	60	5.3 (2.8)			0.0006
Passivity (PDS), Activities	68	1.8 (1.9)	60	0.49 (1.9)			0.02
Personality (NEO-PI-R), Neuroticism	68	52.2 (11.3)	60	53.0 (9.8)			0.88
Personality (NEO-PI-R), Extraversion	68	49.9 (9.6)	60	48.5 (9.2)			0.49
Personality (NEO-PI-R), Openness	68	43.5 (8.5)	60	40.3 (9.1)			0.04

¹Executive Function is a dichotomous variable. The percentage of “yes” responses are presented here. Fisher’s exact test was used to compare the scores.

Variable	Verbal Assistance		Physical Assistance		p-value
	N	Mean (SD)	N	Mean (SD)	
Personality (NEO-PI-R), Agreeableness	68	48.0 (12.5)	60	48.9 (9.7)	0.62
Personality (NEO-PI-R), Conscientiousness	68	48.5 (10.4)	60	47.0 (10.6)	0.37

Abbreviations: MMSE=Mini-Mental State Examination (Range 0–30, higher scores indicate greater cognitive function); Language (Range 0–8, higher scores indicate greater language ability); Executive Function (0=no, 1=yes); PGDRS= Psychogeriatric Dependency Rating Scale (Range 0–34, higher scores indicate greater dependency); CMAI=Cohen-Mansfield Agitation Inventory (Range 0–29, higher scores indicate greater agitation); PDS=Passivity in Dementia Scale (Range (-16) – (+40), higher scores indicate less passivity); NEO-PI-R= Form R of the Revised NEO Personality Inventory (Raw scores converted to T-scores with a mean of 50 and SD of 10).

¹Executive Function is a dichotomous variable. The percentage of “yes” responses are presented here. Fisher’s exact test was used to compare the scores.