



The Oral Health Self-Care Behavior and Dental Attitudes among Nursing Home Personnel

R. Constance Wiener, MA, DMD, PhD^{1,2}; Richard Meckstroth, DDS¹

¹Dental Practice and Rural Health, School of Dentistry, West Virginia University, PO Box 9448, 104A Health Sciences Center Addition, Morgantown, WV 26506, United States

²Department of Epidemiology, School of Public Health, West Virginia University, PO Box 9448, 104A Health Sciences Center Addition, Morgantown, WV 26506, United States

Corresponding author: R. Constance Wiener, Dental Practice and Rural Health, School of Dentistry, West Virginia University, PO Box 9448, 104A Health Sciences Center Addition, Morgantown, WV 26506, United States

Abstract. The need for nursing home care will increase for the next several decades. Rural areas will be impacted in particular, as many older adults live in rural areas. Daily oral infection control changes when a person moves from independent living to institutional living. Oral care to dependent individuals is influenced by many factors. The purpose of this study is to determine the association of oral health self-care behavior with dental attitudes in nursing home personnel in a rural state. A survey was provided to attendees at an oral health conference. Questions were asked to determine dental knowledge, oral health self-care behavior, and dental care attitudes. Of 128 long term care health care facilities' personnel invited, there were 31 attendees, and 21 of the attendees participated (67.7%). Nursing home personnel had a high level of dental knowledge. Oral health self-care behavior was independently influenced by dental knowledge ($\beta=0.17$; $p=0.0444$) and dental attitudes ($\beta=0.55$; $p=.0081$). Further investigation is needed to determine if oral health self-care attitudes and oral self-care behavior of nursing home personnel are factors in the provision of quality daily oral infection control for dependent nursing home residents living in rural areas.

Key words: Oral health attitude, Oral health behavior, Nursing home personnel

Introduction

With the increasing number of older adults worldwide, it is anticipated that there will be a greater need for nursing home care, home health care, and assisted living. The U.S. has nearly 17,000 nursing homes. Nursing home personnel provide care to nearly 1.6 million nursing home residents (Xu, et al., 2013). The number of nursing home residents is anticipated to be 3 million by 2030 (Xu, et al., 2013). Many older adults live in rural areas and would prefer to remain either in their homes or in an assisted living/nursing home nearby. Rural areas are more likely to have a greater number of frail older adults, and a greater number of older adults with more chronic disease (Lutfiyya, 2013). Rural older adults have a greater risk for needing to stay in a nursing home (Lutfiyya, 2013). In rural areas, long term nursing home care ratings of 4-star or higher quality were less likely as compared with non-rural nursing homes (Lutfiyya, 2013).

World-wide, adults, who are approaching 65 years, have maintained more of their natural teeth and have had more, consistent, and complex dental care than older adults in the past. Assistance with daily oral infection control or the delivery of daily oral infection control for dependent older adults is a mandated duty as well as a legal requirement for nursing homes to receive U.S. Medicaid payments. However, it is perhaps the most often neglected of the nursing home residents' personal care needs (Sloane, et al., 2013). Poor oral health, such as occurs with periodontal diseases, has been associated with cardiovascular disease, cerebrovascular disease, chronic kidney disease, ventilator associated pneumonia, and impaired cognition, among other chronic, systemic, inflammatory diseases (DeStefano, et al., 1993; Jansson, et al., 2001; Taylor, 2001; Tsai, et al., 2001). Poor oral health is particularly true in frail and functionally dependent nursing home residents (DeVisschere, et al., 2013). The challenge is global. Researchers internationally have shown oral health care of institutionalized older adults to be poor (Weening-Verbree, et al., 2013). The challenge involves not only the oral hygiene of nursing home residents who have natural teeth, but also most denture-

wearing residents who were found to be wearing unhygienic dentures (Weening-Verbree, et al., 2013).

West Virginia is a rural state with 1.85 million residents; 94% of whom are non-Hispanic white, and 16.8% of whom are 65 years and above (US Census Bureau, 2010). From 2007-2011 data, 41% of West Virginia residents had a high school diploma, 18% had some college, and 24% had an Associate, Bachelor or graduate degree compared with the national percentages of 29%, 21%, and 36%, respectively (US Census, 2007-2011). The median income was \$39,550 (US Census Bureau, 2010). Only Vermont is more rural than West Virginia; West Virginia is 63% rural, and most of the older adult population of West Virginia lives in a rural area (Glover, et al., 2001). West Virginia's rural older adults have many barriers to quality health care services and hospitals, hospices and nursing homes (Glover, et al., 2001). Nursing home personnel in rural areas also have many challenges from limited staffing, to over work. Providing daily oral infection control is one such challenge with factors involving (among others): oral health mindedness attitude (self-experience, importance, priority); knowledge and skills; an attitude of lack of reflection (respondents in one study indicated they had not given oral care for the residents a "moment's thought"); and oral health care attitude (responsibility, consciousness, empathy, willingness, skepticism, disgust, forgetfulness, laziness, carelessness, etc.) (De Visschere, et al., 2013).

Ajzen's (1991) Theory of Planned Behavior (TPB) has been used to predict behavior performance. In concept, behavior is influenced by attitudes, self-efficacy, intentions, and subjective norms (Gerend & Shepherd, 2012). That is, planned behavior is more likely to occur when there is a positive attitude toward that behavior; there are social influences to perform the behavior; a person feels confident that he or she has the ability to perform the behavior; and the person desires to achieve the behavior. Researchers indicated in a study with mothers who reported poor oral health self-care behavior that their children were more likely to have poorer oral health than children of mothers with good oral health self-care behavior (Shearer, et al., 2011)—the behaviors of the mothers for their own self-care

behavior influenced the care to children. The attitudes of parents also have been shown to be associated with dental caries in their children (Skeie, et al., 2008). A similar association is possible with nursing home personnel's oral health self-care behaviors and the oral health of dependent nursing home residents.

The level of oral health self-care behavior of nursing home personnel is not known, particularly in rural service areas. The purpose of this study is to determine the level of oral health self-care behavior of nursing home personnel and the association of oral health self-care behavior with dental attitudes to oral care in West Virginia nursing home personnel who are non-dental professionals as compared with dental professionals. Further investigation will be needed to determine if oral health attitudes and oral self-care behavior are factors in the provision of quality daily oral infection control for dependent nursing home residents living in rural areas. The research hypothesis of this study is that dental attitudes influence self-care behavior in nursing home personnel in a rural state.

Material and Methods

Nursing home administrators, certified nursing assistants, nurses, and dentists from the state of West Virginia were invited to a conference to discuss the oral health of nursing home residents within the state. West Virginia is in the central region of Appalachia. It has small towns and mid-sized communities throughout the rural, mountainous state. The conference was located in the middle of the state to provide the greatest access to the greatest number of conferees. A survey was presented at the conference.

Variables

The outcome variable, oral health self-care behavior, was measured using a scale from 1 to 5 applied to the responses to the statement: "I brush as well as I should." The responses were "strongly disagree, disagree, neutral, agree, and strongly agree."

The key independent variable was oral health care attitude, as measured by the response to: "I consider my dental health to be important." A 1 to 5 point scale

was used from “definitely no” to “definitely yes.” Other variables were dental knowledge and profession. Dental knowledge was the summative score of the knowledge questions on the survey excluding 3 questions which lacked reliability. Profession was determined by the response to the statement, “My occupation is” in which the responses were nursing home administrator, nurse at a nursing home, certified nursing assistant, a dentist of record for a nursing home and other. Other included dental assistants and dental hygienists. Nursing home administrators, nurses at nursing homes, and certified nursing assistants were coded as non-dental professionals. Dentists and others were coded as dental professionals.

Analysis

SAS version 9.3 (Carey, NC) was used to determine: frequency; Fisher’s exact analyses; T-test differences of the means of the pretest and posttest for knowledge; and regression on oral health self-care behavior and the other variables.

Ethics Approval

This study was acknowledged by the West Virginia Institutional Review Board, review number, 1308082684.

Results

From the 128 long term care health care facilities listed on the official State of West Virginia, Department of Health and Human Resources, Bureau for Public Health, Office of Health Facility Licensure and Certification website, there were 31 participants at the Oral Health Conference. Descriptive characteristics are listed in Table 1. Of the participants, 21 (67.7%) completed the survey. There were 9 (42.9%) nurses and certified nursing assistants, 8 (38.1%) dentists and 4 (19.1%) other. The median education was college degree and above. All participants had graduated from high school. Eighty-one percent of the participants had been employed by a nursing home for more than 1 year.

The responses for all participants for the outcome variable (oral health self-care behavior) were: 47.6%--definitely yes, (they had appropriate oral health self-care behavior); 23.8%--yes; 9.5%--neutral; 4.8%--no; and 9.5%--definitely no. The

responses were dichotomized with “definitely yes,” and “yes” as positive oral health self-care behavior and “neutral,” “no,” and “definitely no” as negative self-care behavior. Both dental professionals and non-dental professionals indicated similar oral health self-care behavior (Fisher’s exact $p=1.000$). There were 72.7% dental professionals and 77.8% non-dental professionals who indicated positive oral health self-care behavior and 27.3% dental and 22.2% non-dental professionals indicated that they did not have positive self-care behavior.

The responses for all participants for the personal oral health care attitude variable, were 57.1%—definitely yes; 9.5%—yes; 4.8%—neutral; 4.8%—no; and 9.5% definitely no. The responses were dichotomized with “definitely yes,” and “yes” as positive personal oral health care attitudes, and “neutral,” “no,” and “definitely no” as negative personal oral health care attitudes. Both dental professionals and non-dental professionals indicated similar attitudes toward the importance of personal oral health (Fisher’s exact $p=.5765$). There were 88.9% dental professionals and 66.6% non-dental professionals who indicated that they had an attitude of considering personal oral health as important.

Overall, both the non-dental professionals and dental professionals entered the conference with a high level of dental knowledge and had comments about the desire to provide good oral care to nursing home residents. The overall mean score on the pretest was 42.4 of a maximum agreement potential of 50. Dental professionals had a mean score of 43.2 and non-dental professionals had a mean score of 41.1 (Fisher’s exact $p = 0.0387$). T-test comparison of the pretest and posttest indicated an increase in response confidence (progressing from an agree response to a strongly agree response or from a disagree response to a strongly disagree response) from the pretest to the posttest, although the improvement was not statistically significant ($p=0.2162$). The high level of initial knowledge resulted in a small overall effect change. The pretest and posttest results are presented in Table 2.

In regression analysis on oral health self-care behavior, a significant model ($p = 0.0049$) included dental knowledge ($\beta=.20$; $p=.0332$), oral health self-care attitudes

($\beta=.58$; $p=.0072$) and profession ($\beta= .52$; $p=.3548$). A parsimonious, significant model ($p=0.0019$) resulted when profession (a variable not statistically significant in the model) was removed. Dental knowledge ($\beta=0.17$; $p=0.0444$) and personal oral health care attitude ($\beta=0.55$; $p=.0081$) were independently significant in explaining oral health self-care behavior in non-dental personnel and dentists/others.

Discussion

This study explored non-dental nursing home professionals' attitudes toward oral health self-care behavior in rural West Virginia. Ajzen's TPB (1991) indicated that attitudes strongly influence and predict behavior. This study supported the TPB in that attitudes toward the importance of personal oral health were independently associated with oral health self-care behavior. Additionally, dental knowledge was independently associated with oral health self-care behavior. Further research is needed to determine if an attitude of the importance of oral health to oneself, as expressed in the non-dental professionals in this study, is a factor in the provision of daily oral infection control for dependent nursing home residents.

"Rural culture" has been previously described as not prioritizing prevention (Rosenwasser, et al., 2013), however that was not consistent with the results of this study. The rural non-dental nursing home professionals and dental professionals in this study reported oral health self-care preventive behaviors and an indication to provide similar preventive care to nursing home residents. Brushing a dependent person's teeth is a duty that is often difficult to accomplish, and a duty that was found in some studies of nursing home professionals to be disgusting (Sloan, et al., 2013; De Visschere, et al., 2013). In this study, nursing home personnel comments were focused on other issues, such as a desire to be more familiar with caring for individuals who have dental implants, implant retained dentures, night apnea appliances, or removable dental prostheses fabricated with newer materials and techniques. Researchers in Japan noted that although residents with dental implants were in 19% of the facilities, nearly 50% of the survey respondents did not know the proper means to care for the implants (Kimura, et al., 2013). And

although there was no dental knowledge shortage in this study, there were comments expressing the need to be current, have more knowledge, and develop improved skills to meet the changing needs of older adults.

This study is limited in generalizability as the participants were self-selected. By participating in the conference, the participants had demonstrated an interest in oral health care for nursing home residents. However, this study adds to the literature information and insight of self-care preventive behavior from a group of rural non-dental and dental professionals. Such access is often difficult to obtain.

For rural professional conference attendees, the attitude of importance for personal oral health and dental knowledge were correlated with oral health self-care behavior. Oral health care attitude (De Visschere, et al., 2013) and dental knowledge are two factors in the provision of quality daily oral infection control for nursing home residents. Further investigation is needed to determine if oral health self-care attitudes and oral self-care behavior are factors in the provision of quality daily oral infection control for dependent nursing home residents living in rural areas.

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References

- [1] AAP, American Academy of Periodontology. Patient Resources: What is Periodontal Disease? 2013. <http://www.period.org/patient-resources>.
- [2] Ajzen I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- [3] DeStefano F, Anda RF, Kahn HS, et al. (1993) Dental disease and risk of coronary heart disease and mortality. *Br Med J*, 306, 688-691.
- [4] De Visschere L, de Baat C, De Meyer L, van der Putten G, Peeters B, Seoderfelt B, Vanobbergen J. (2013). The integration of oral health care into day-to-day care in nursing homes: a qualitative study. *Gerodontolgy*, doi: 10.1111/ger.12062
- [5] Gerend MA, Shepherd JE. (2012). Predicting human papillomavirus vaccine uptake in young adult women: Comparing the Health Belief Model and Theory of Planned Behavior. *Annals of Behavioral Medicine*, 44, 171-180.
- [6] Jansson L, Lavstedt S, Frithiof L, Theobald H. (2001). Relationship between oral health and mortality in cardiovascular diseases. *J Clin Periodontol*, 28,762-768.
- [7] Kimura T, Wada M, Suganami T, Miwas S, Hagiwara Y, Maeda Y. (2013)/ Dental Implant Status of Patients Receiving Long-Term Nursing Care in Japan. *Clin Implant Dent Relat Res*, 20, doi:10.1111/cid.12148.
- [8] Lutfiyya MN, Gessert CE, Lipsky MS. (2013). Nursing Home Quality: A Comparative Analysis Using CMS Nursing Home Compare Data to Examine Differences Between Rural and Nonrural Facilities. *Journal of the American Medical Directors Association*, 14, 593–598.
- [9] Rosenwasser LA, McCall-Hosenfeld JS, Weisman CS, Hillemeier MM, Perry AN, Chuang CH. [2013]. Barriers to colorectal cancer screening among women in rural central Pennsylvania: Primary care physicians' perspective. *Rural and Remote Health*, 13, 2504.
- [10] Shearer DM, Thomson WM, Broadbent JM, Poulton R. (2011). Maternal Oral Health Predicts Their Children's Caries Experience in Adulthood. *JDR*, 90,672-677.
- [11] Skeie MS, Espelid I, Riordan PJ, Klock Ks. (2008). Caries increment in children aged 3-5 years in relation to parents' dental attitudes: Oslo, Norway 2002 to 2004. *Community Dent Oral Epidemiol*, 36, 441-450.
- [12] Sloane PD, Zimmerman S, Chen X, Barrick AL, Poole P, Reed D, Mitchell M, Cohen LW. (2013). Effect of a Person-Centered Mouth Care Intervention on Care Processes and Outcomes in Three Nursing Homes. *Journal of the American Geriatrics Society*, 61, 1158-1163.
- [13] Taylor GW. (2001). Bidirectional interrelationships between diabetes and periodontal disease in African Americans. *Compend Contin Educ Dent*, 22, 42-48.
- [14] Tsai C, Hayes C, Taylor GW. (2002). Glycemic control of type 2 diabetes and severe periodontal disease in the US adult population. *Community Dent Oral Epidemiol*, 30, 182-192.

- [15] U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, American Community Survey, Census of Population and Housing, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits. <http://quickfacts.census.gov/qfd/states/54000.html>
- [16] U.S. Census Bureau, 2007-2011 American Community Survey
<http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>
- [17] Weening-Verbree L, Huisman-deWaal G, van Achterberg T, Schoonhoven L. (2013). Oral health care in older people in long term care facilities: A systematic review of implementation strategies. *International Journal of Nursing Studies*, 50, 569-582.
- [18] Xu D, Kane RL, Shamliyan TA. (2013). Effect of nursing home characteristics on residents' quality of life: A systematic review. *Archives of Gerontology and Geriatrics*, 57, 127-142.

Table 1 Descriptive characteristics of the participants, N=21

Profession	N	Percentage
Nurse at a nursing home	3	14.3
Certified Nursing Assistant at a nursing home	6	28.6
Dentist of record for a nursing home	8	38.1
Other	4	19.1
Education		
Less than high school	0	0
High school degree	4	19.1
Some college, technical school	3	14.3
College, technical school degree and above	12	57.1
Time with the facility		
Less than 1 year	1	4.8
More than 1 year	17	81.0

Table 2 Dental Knowledge

Statement	Pretest % correct answer	Posttest % correct answer
Gum disease is linked to heart disease.	80.9% strongly agree 19.1% agree	85.7% strongly agree 9.5% agree
Poor diabetes control is linked to <i>cavities</i> .	0% strongly disagree 0% disagree	0% strongly disagree 0% disagree
People with [a] dry mouth have a higher cavity risk than people with normal salivary flow.	76.2% strongly agree 23.8% agree	76.2% strongly agree 23.8% agree
Gum (periodontal) disease is a chronic inflammatory disease (AAP, 2013)	71.4% strongly agree 19.1% agree	85.7% strongly agree 9.5% agree
With age, enamel thins, dentin thickens, and the pulp <i>increases</i> .	33.3% strongly disagree 23.8% disagree	23.8% strongly disagree 28.6% disagree
Daily oral infection control is important.	90.5% strongly agree 9.5% agree	90.5% strongly agree 4.8% agree
Loose teeth may pose an aspiration hazard.	76.2% strongly agree 19.1% agree	85.7% strongly agree 9.5% agree
Many medications used by older adults <i>increase</i> salivary flow.	38.1% strongly disagree 33.3% disagree	52.4% strongly disagree 14.3% disagree
Chronic inflammatory diseases may be linked to heart disease.	57.1% strongly agree 38.1% agree	81.0% strongly agree 14.3% agree
Dental/medical problems and costs may be lower with good daily oral infection control.	71.4% strongly agree 23.8% agree	90.5% strongly agree 4.8% agree