This article was downloaded by: [Virginia Commonwealth University Libraries] On: 17 October 2013, At: 07:10 Publisher: Routledge Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Gerontology & Geriatrics Education

Publication details, including instructions for authors and subscription information: http://www.tandfonline.com/loi/wgge20

An Interprofessional Educational Approach to Oral Health Care in the Geriatric Population

Patricia Brown Bonwell^a, Pamela L. Parsons^b, Al M. Best^c & Sabrina Hise^a

^a Dental Hygiene Program, Department of Oral Health Promotion and Community Outreach , School of Dentistry, Virginia Commonwealth University , Richmond , Virginia , USA

^b Department of Internal Medicine , School of Medicine, Virginia Commonwealth University , Richmond , Virginia , USA

^c Faculty Research Development , School of Dentistry, Virginia Commonwealth University , Richmond , Virginia , USA Accepted author version posted online: 05 Aug 2013.Published online: 16 Oct 2013.

To cite this article: Patricia Brown Bonwell , Pamela L. Parsons , Al M. Best & Sabrina Hise , Gerontology & Geriatrics Education (2013): An Interprofessional Educational Approach to Oral Health Care in the Geriatric Population, Gerontology & Geriatrics Education, DOI: 10.1080/02701960.2013.827572

To link to this article: <u>http://dx.doi.org/10.1080/02701960.2013.827572</u>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms &

Conditions of access and use can be found at http://www.tandfonline.com/page/terms-and-conditions



An Interprofessional Educational Approach to Oral Health Care in the Geriatric Population

PATRICIA BROWN BONWELL

Dental Hygiene Program, Department of Oral Health Promotion and Community Outreach, School of Dentistry, Virginia Commonwealth University, Richmond, Virginia, USA

PAMELA L. PARSONS

Department of Internal Medicine, School of Medicine, Virginia Commonwealth University, Richmond, Virginia, USA

AL M. BEST

Faculty Research Development, School of Dentistry, Virginia Commonwealth University, Richmond, Virginia, USA

SABRINA HISE

Dental Hygiene Program, Department of Oral Health Promotion and Community Outreach, School of Dentistry, Virginia Commonwealth University, Richmond, Virginia, USA

An interprofessional educational approach was used to provide five in-service training sessions for all direct health care providers in a long-term care facility, and one half-day seminar/live webinar for community-licensed health care professionals. Content included

This program was made possible in part by Geriatric Training and Education (GTE) funds appropriated by the General Assembly of Virginia and administered by the Virginia Center on Aging at Virginia Commonwealth University (GTE 06-11). Lucy Corr Village, a continuing care retirement community located in Chesterfield County, Virginia, hosted the in-service training sessions and half day in-person seminar/live webinar. Support for the project was provided by the facility's CEO, James R. Musgrave, Director of Marketing, Debra Marlow, Dental Clinic Coordinator, Patricia Bonwell, and all Lucy Corr Foundation board members. Appreciation is extended to the following presenters, panel members, and moderator respectively: Esra Sahingur, DDS, MS, PhD; John Svirsky, DDS, MEd; Ellen Byrne, BS Pharm, DDS, PhD; Kerry Williams, BS, RD; Breshae Adkins, OTR/L; Phyllis Bastone, RN, LHNA; Arline Bohannon, MD; Patricia Bonwell, RDH, PhD; Michael Hanley, DDS; and Pamela Parsons, PhD, GNP. A thank you is extended to the Virginia Dental Association (VDA) for hosting the live webinar on their website.

Address correspondence to Patricia Brown Bonwell, Dental Hygiene Program, Department of Oral Health Promotion and Community Outreach, School of Dentistry, Virginia Commonwealth University, P.O. Box 980566, Richmond, VA 23298-0566, USA. E-mail: pbbonwell@vcu.edu

presentations by five disciplines: (a) periodontist: oral-systemic relationship, (b) oral pathologist: oral pathology, (c) pharmacist: oral health-pharmacological link, (d) dietitian: oral health-dietary link, and (e) occupational therapist: providing and practicing proper oral hygiene. Significant improvement in posttest scores for the five in-service training sessions and the half-day seminar/live webinar was revealed in t-test results, representing an increase in knowledge gained. Approximately 80% of the 145 participants indicated that they would make a change in patient care. Findings indicate that the in-service training sessions and half-day seminar/live webinar supported development of the geriatric work force by utilizing an interprofessional educational approach which will assist in meeting the oral health care needs of the geriatric population.

KEYWORDS dental, education, geriatric, interdisciplinary, interprofessional, oral health

INTRODUCTION

Background

According to the Administration on Aging (AoA) adults age 65 and older numbered 39.6 million in 2009, an increase of 4.3 million or 12.5% since 1999 (AoA, U.S. Department of Health and Human Services [USDHHS], 2010). The population age 65 and older increased from 35 million in 2000 to 40 million in 2010 (a 15% increase) and is estimated to increase to 55 million in 2020 (a 36% increase for that decade). According to the U.S. Census Bureau (2010), approximately 4% of adults aged 65 and older reside in nursing home facilities. In 2009 4.1% of adults age 65 and older resided in long-term care (LTC) settings such as nursing homes (1.4 million). However, the percentage increases dramatically with age, ranging (in 2007) from 0.9% for persons age 65 to -74 to 3.5% for persons 75 to 84 and 14.3% for persons age 85 and older.

Importance of Maintaining Oral Health in Older Adults

Impaired oral health may adversely affect diet, nutrition, sleep patterns, psychological status, social interactions, and other activities of life in some older adults (DeBiase & Austin, 2003). Research findings suggest that improvement of oral health has a positive impact on general health and may delay mortality (Padilha, Hilgert, Hugo, Bos, & Ferrucci, 2008). The oral cavity provides entrance to the body for every nutrient necessary for life. Daily dental care for the older adult population has shifted from primarily providing denture care to providing more brushing, flossing, and utilizing other dental therapy to maintain the health of natural dentition (Donaldson, 2011). This change is primarily because of an increase in the number of older adults retaining more of their natural dentition. The number of older adults who have retained some or all of their natural dentition is increasing as the rate of edentulism in the United States has declined significantly from 20.3% in 1972 to 13.9% in 2001(Cunha-Cruz, Hujoel, & Nadanovsky, 2007).

Maintaining good oral health is a critical factor in maintaining overall health and well-being in older adults. Research findings support a link between gum disease and systemic conditions such as cardiovascular disease (Genco, Offenbacher, & Beck, 2002), diabetes (Gurenlian, 2006), bacterial pneumonia (Terpenning, 2005), and Alzheimer's disease (Watts, Crimmins, & Gatz, 2008). The high prevalence of periodontitis in older adults (Boehm & Scannapieco, 2007) makes the oral-systemic interaction important to address in this population.

Approximately 15,000 older adults are affected by oral cancer each year. The average age of diagnosis is 60 to 65 (Ries et al., 1999; USDHHS, 2000). Pulling from the National Cancer Institute site, the median age at death for cancer of the oral cavity and pharynx was 67 from 2003 to 2007. Oral cancer is responsible for nearly 8,000 deaths each year, and more than one half of these occur among those age 65 and older (Centers for Disease Control [CDC], 2001). Routine oral examines are needed for early detection of oral cancer.

Persons with decayed teeth and visible plaque are more likely to develop pneumonia than those without decayed teeth and visible plaque (Terpenning et al., 2001). These findings support the need for proper oral hygiene and proper care of dental prosthetics worn. Proper oral hygiene is attributed to a decrease in the prevalence of pneumonia in nursing home residents (Sjogren, Nilsson, Forsell, Johansson, & Hoogstraate, 2008). It is estimated that an annual savings of \$800 million in nursing home costs can be attributed to a decrease in nursing home acquired pneumonia through improved oral hygiene (Terpenning & Shay, 2002).

Oral Health Care in Nursing Home Facilities

The provision of oral health care to nursing home residents can be quite challenging (Ellis, 1999). Residents of nursing home facilities often present with complex medical histories and health status (Lamster, 2001). In 1987, the Omnibus Budget Reconciliation Act (OBRA) was introduced and became effective on April 1, 1990. This legislation states that all nursing home facilities receiving Medicaid and Medicare reimbursements must provide routine and emergency oral health care to residents (U.S. Code Collection, 2010).

Despite the high prevalence of oral disease and need for care (USDHHS, 2000), the utilization of dental services by nursing home residents is very low (Guay, 2005). Oral care in institutional settings is often neglected, although

the minimum data set includes a section on resident oral health (Dolan, Atchison, & Huynh, 2005). The oral health care provided nursing home residents has been described as "deplorable" (Cohen-Mansfield & Lipson, 2002, p. 251). Claims are made that oral health in these facilities is not maintained due to lack of adequate staff numbers, lack of proper staff education, and lack of adequate funding to assist in making a change. Nursing staff refers to certified nursing aides (CNAs), licensed practical nurses, and registered nurses. It is the responsibility of the nursing staff, primarily CNAs, to provide oral care to nursing home residents, especially to functionally dependent residents.

Oral-systemic health links support the need and importance of nursing staff in maintaining oral care of residents. However, research shows that nursing staff at nursing home facilities report lack of education preparation, lack of time, inadequate equipment, and uncooperative behavior displayed by residents as barriers to providing oral care (Jablonski et al., 2009). CNAs need better educational preparation and competency training for providing routine oral health care to residents (Coleman & Watson, 2006).

There is a need for increasing the utilization and investigation of continuing oral health care education programs for LTC facility nursing staff members (Ettinger, Watkins, & Cowen, 2000). Oral health care training for long-term facility nursing staff members increases knowledge and improves the oral health status of LTC residents (Le, Dempster, Limeback, & Locker, 2012; Nicol, Sweeney, McHugh, & Bagg, 2005).

There has been an increase interest to include geriatric oral health care education in all dental school curriculum and geriatrics has been included within the curriculum of many U.S. dental schools; however, the format in which it appears varies greatly (Mohammed, Preshaw, & Ettinger, 2003). Unfortunately, clinical experience has not kept up with didactic teaching of geriatric dentistry. Research findings reveal concepts that could be applicable to all dental school curriculum (Ettinger, 2012). Woldrop et al. (2006) performed a study to assess dental students' knowledge about aging, their comfort with varying types of patients, and their strategies for managing difficult situations. An 8-week course on special needs patients provided only to 4th-year students served as the intervention and was evaluated by a pre- and posttest measure. Study results indicated that dental students' knowledge of aging was low, comfort with geriatric issues improved after the first year of intervention, and strategies for patient care changed with experience (Waldrop et al.).

To gain an understanding of how the oral-systemic relationship is being taught in predoctoral/undergraduate curricula, specifically medicine, nursing, and pharmacy programs, surveys were completed online by associate or academic deans representing various English speaking universities located around the world. Findings identified deficiencies in the curricula for these disciplines indicating that adequate content pertaining to oral-systemic health is not included (Hein, Schönwetter, & Iacopino, 2011).

Interprofessional Educational

The Centre for the Advancement of Interprofessional Education (CAIPE; 2013) defines *interprofessional education* (IPE) as "occurring when two or more professions learn with, from, and about each other to improve collaboration and the quality of care." The World Health Organization (WHO, 2010) has been a strong proponent for IPE, indicating that it leads to effective collaborative practice resulting in better health services and better outcomes.

IPE programs have been incorporated into geriatrics training across health care disciplines. A combination of a didactic and clinical practicum teaching interdisciplinary team care to students from the disciplines of medicine, nursing, and social work is an effective model of interdisciplinary education that improves quality of care delivered to older Americans. This approach was also effective in changing the attitudes of health profession students about interdisciplinary care (Fulmer et al., 2005).

An interprofessional elective course in geriatric pharmacy was designed for 2nd- and 3rd-year pharmacy students. The IPE component of the course, centered on patient assessment and care planning for residents of assisted living facilities, was delivered in conjunction with affiliated occupational therapy and physical therapy programs. Four major themes were identified from feedback of participating pharmacy students. These include:

1) Students gained a better understanding of the roles of occupational therapist and physical therapist, 2) Interactions with occupational and physical therapy students had a direct impact on pharmacy students' recommendations and approach to patients, 3) Students recognized that an interprofessional approach is optimal for patient care, and 4) The course and interprofessional interactions gave students a better understanding of the unique needs of geriatric patients. (Haddad, Coover, & Faulkner, 2011, p. 120)

There has been a spark in the use of IPE in the field of dentistry. An IPE approach to oral health care is necessary, and dentistry must lead the conversation and participate in the solution to the geriatric oral health care crisis (Wilder et al., 2008). Several universities have moved forward with an IPE initiative and developed strong interprofessional training programs that include the discipline of dentistry (American Dental Educators Association [ADEA], 2011).

The ADEA along with six other national health profession associations, the American Association of Colleges of Nursing, the American Association of Colleges of Osteopathic Medicine, the American Association of Colleges of Pharmacy, the Association of American Medical Colleges, and the Association of Schools of Public Health, have joined together to form the Interprofessional Education Collaborative (IPEC). The focus of IPEC is to better integrate and coordinate the education of members of the patient health care team, including nurses, physicians, dentists, pharmacists, public health professionals, and other allied health professions to provide more collaborative and patient centered care (American Dental Association [ADA], 2012). IPEC has created four interprofessional collaborative practice competency domains: (a) values/ethics for interprofessional practice, (b) roles/responsibilities, (c) interprofessional communication, and (d) teams and teamwork (Interprofessional Education Collaborative Expert Panel, 2011). These domains were used to create core interprofessional competencies to be implemented into student curricula for participating disciplines.

An interprofessional partnership has been advocated for by researchers in hopes of improving oral health for the residents of LTC facilities as well as for independent nonfacility members of the geriatric population (Bailey, Gueldner, Ledikwe, & Smiciklas-Wright, 2005; Murray, Ede-Nichols, & Garcia-Godoy, 2006; Nederfors, Paulsson, Isaksson, & Fridlund, 2000). To address the issue of improving the provision of oral health care to residents of LTC facilities and nonfacility members of the geriatric population, the dental coordinator of a LTC facility conceptualized a unique IPE approach. The approach was implemented through an IPE program held at that facility. Findings from this program were evaluated, and results pertaining to an increase in direct healthcare provider knowledge are shared and discussed.

PURPOSE

The purpose of this project was to utilize an IPE approach to educate direct health care providers on the topic of oral health care for members of the geriatric population residing in LTC settings and in the community. For this project, direct health care providers includes members from health care disciplines such as nursing, pharmacy, medicine, occupational therapy, dietetics, physical therapy, social work, optometry, podiatry, dentistry, and other allied health professions. The specific aim of the investigation was to determine if using the following described IPE approach to oral health care improved knowledge of the geriatric work force and encouraged change in patient care provided. The target population in this project consisted of students and providers from the following direct healthcare provider disciplines: occupational therapy, medicine, dietetics, dentistry, pharmacy, and all levels of nursing.

METHOD

Through grant funding received, an IPE program provided five in-service training sessions and one half-day in-person seminar/live webinar, free of

charge to direct health care provider participants. No consent forms were obtained, and the research study evaluating this training approach qualified for exempt status through an IRB review.

For this investigation, Level 2 of the Kirkpatrick (1996) four-level evaluation of training model served as the framework to evaluate the impact of the IPE program utilized. Level 2 of the model is learning, which is a measure of the knowledge acquired, skills improved, or attitudes changed due to training (Kirkpatrick6). Level 2 best addressed the specific aim of this investigation.

Five In-Service Training Sessions

Five 45 minute in-service training sessions were held in March and April of 2012 and were offered to all direct health care providers employed by a LTC facility and students of its Certified Nursing Program. An IPE approach to providing and maintaining oral health for nursing home residents was covered in this training. This training aided the host facility with meeting accreditation requirements.

Five speakers presented (one at each session), and addressed the following topic areas. Presenters incorporated PowerPoint and/or Keynote presentations as well as demonstrations. Educational content was presented in a manner to accommodate the range of education levels of participants. All speakers addressed the importance of interprofessional collaboration to assist in addressing oral and overall health issues.

- 1. A periodontist focused on the basic concepts of the oral-systemic relationship. This included an overview of periodontal disease etiology, pathogenesis and clinical presentation. Also provided was an overview of proposed links between systemic and periodontal health including cardiovascular diseases, stroke, stress, smoking, diabetes, respiratory diseases, and osteoporosis.
- 2. An oral pathologist reviewed basics of what and how to look for unusual oral pathology. This included an overview of oral cancer statistics along with descriptions and photographs of variances in normal oral pathology accompanied by descriptions and photographs of oral pathological lesions that need attention. Also provided was instruction on how to perform an extra and intra oral screening.
- 3. A pharmacist, who is also a dentist, addressed the basics of the oral healthpharmacological link. This included an overview of the components and importance of saliva not only for digestive health, but also for oral health. Also included was an overview of the many medications taken by members of the geriatric population that cause xerostomia, osteonecrosis of the jaw, and gingival hyperplasia as well as the importance of proper fluoride use.

- 4. A dietitian addressed the oral health and dietary link. This included an overview of foods that are more cariogenic (contribute to tooth decay) as well as foods that slow the production of acid by bacteria in the mouth. Also covered was how poor oral health can impact intake of a healthy diet.
- 5. An occupational therapist provided instruction on the provision of proper oral hygiene care and how to practice proper oral hygiene techniques. This included an overview and demonstration of adaptations and adaptive tools available to assist older adults with maintaining independence while providing oral care as well as for direct health care providers who assist the more dependent geriatric adults. Also included was an overview of oral care for the edentulous patients and their prosthetics.

One Half-Day In-Person Educational Seminar/Live Webinar

A $4 \frac{1}{2}$ -hour in-person seminar/live webinar was held on June 1, 2012, at the same LTC facility for licensed direct health care providers not employed by the facility, but practicing in the surrounding community. It was marketed by inviting established direct health care professionals to attend. Notice of this educational opportunity was posted on the websites of medical, pharmacy, nursing, occupational therapy, dietetic, and dental associations, as well as on oral health association websites and rural clinic websites. E-mail notices were sent to licensed nurses, pharmacists, nursing home administrators, and dental hygienists. Posters/flyers were hung at various medical settings and venues.

An IPE approach to providing and maintaining oral health for dependent and independent members of the geriatric population was covered. This IPE program addressed the educational preparation needed to provide oral health care to dependent and independent members of the geriatric population residing in the community. This seminar/webinar aided health care professionals with obtaining continuing education credits needed to maintain their professional licenses.

The same five speakers who presented at the five in-service training sessions also presented in the same manner (each presented for about 45 minutes) addressing the same topic areas previously listed that were covered in the five in-service training sessions. The content was presented at a level appropriate for the education and skill level of the participating audience, which consisted primarily of licensed direct health care professionals. There was also a panel discussion during the last 45 minutes. Panel members included a physician who is the medical director at a nursing home facility and on staff at a teaching hospital, a registered nurse who is an administrator of health services at a nursing home facility, a dentist who provides dental care to nursing home residents and to geriatric patients in private practice, a gerontologist who is also registered dental hygienist and serves as

9

dental coordinator for a nursing home facility, and a pharmacist who is also a dentist.

Statistical Methods

Each presenter created pre- and posttests that were administered as multiplechoice knowledge questionnaires. The 17 items on the half-day seminar/live webinar questionnaire were selected from the 25 items used for the five in-service training sessions. Questionnaire reliability was determined by Cronbach's alpha. The test that looked at all domains of questionnaires utilized revealed good reliability (alpha = .69). The questionnaires were scored as percentage correct. Scores from pre- and posttests administered at each of the five in-service training sessions were compared using a *t*-test. Differences in pre- versus postdifferences by professions was compared using a two-way ANOVA. In-person participants completed the questionnaire on paper, and those who attended via live webinar completed the questionnaire online. No identifiers were included as markers on the pre- and posttests administered for the five in-service training sessions, however, participants were asked to indicate their discipline upon sign in.

Three items from a course evaluation administered were evaluated. A yes/no item asked participants if they would make a change in practice as a result of participating in the training. The other two items used a 5-point Likert-type scale to indicate the confidence and commitment of implementing a change in practice. All analyses were performed using SAS software (version 9.3).

RESULTS

Five In-Service Training Sessions

There were 88 individuals participating in the five in-service training sessions combined held at a LTC facility. All but one were females and the mean age was 44 (SD = 12.5). Levels of education ranged from high school diplomas/General Education Diplomas to masters' degrees. Participants were employees of the LTC facility where the training was held and students of its CNA program. Participants were primarily members of all levels of nursing care (except nurse practitioner), a minimal number of administrative staff members, and one social worker. The training was mandatory for members of the nursing staff. Figure 1 shows the number of participants from different disciplines.

The mean number of years of practice was 12.2 (SD = 11.8, range from 0 - 0 36). The average of all posttest scores was higher than the average of all pretest scores for all five of the in-service training sessions. Using *t*-tests, results revealed a significant improvement in posttest scores for all

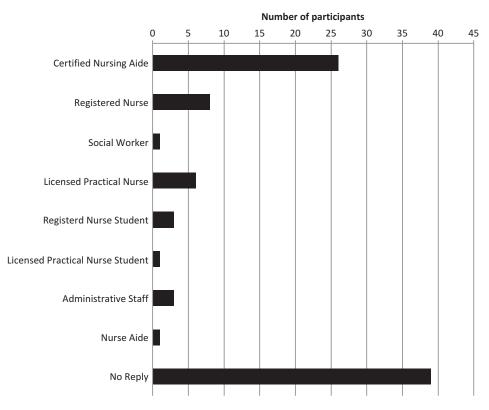


FIGURE 1 Variance in disciplines of attendees for the five in-service training sessions.

sessions except the session presented by the occupational therapist in which knowledge was already high (72%) and did not increase significantly in the posttest (76% correct). See results in Table 1.

Eighty-eight percent of the participants indicated that they would make a change in their practice as a result of participating in the in-service training sessions. Approximately 52% of these participants responded with the highest level of confidence and commitment that they would implement a change.

Half-Day In-Person Seminar/Live Webinar

There were 57 participants of the half-day in-person seminar/live webinar held on June 1, 2012, at the same LTC facility. This population was 86% female, and the mean age was 53years (SD = 9.3). This target population consisted of one community member and the rest were licensed direct health care providers with levels of education ranging from bachelor degrees to masters' degrees in nursing, dental hygiene, occupational therapy, dietary, and pharmacy to doctorate degrees of medicine, dentistry,

Course/date pre post	Mean	SE	95% CI	<i>p</i> value
Oral health-pharmacologic	al link/March 14	í, 2012		
Pre	45.9	3.40	[39.2, 52.6]	
Post	73.3	3.23	[67.0, 79,7]	<.0001
Detecting abnormal oral p	athology/March	20, 2012		
Pre	34.4	3.13	[28.2, 40.5]	
Post	89.0	3.96	[81.2, 96.8]	<.0001
Oral-systemic relationship,	/March 28, 2012			
Pre	51.7	3.61	[44.6, 58.8]	
Post	65.5	5.33	[55.0, 75.9]	<.0001
Enabling proper oral hygie	ene practice/Apr	il 4, 2012		
Pre	72.3	3.18	[66.0,78.5]	
Post	76.4	3.34	[69.9, 83.0]	.3412
Oral health-diet link/April	18, 2012			
Pre	67.1	4.29	[58.6, 75.5]	
Post	98.7	4.57	[89.7,107.7]	<.0001

TABLE 1 Knowledge Gained: Five In-Service Training Sessions: Comparison of Average

 Scores From Pre- and Posttest Scores (Held in March and April 2012)

Note. Pre = pretest knowledge; Post = Posttest knowledge; SE = standard error of the mean, CI = 95% confidence interval, *p* value = result from comparing the two groups on a *t* test comparison of the means.

pharmacy, and philosophy. Figure 2 shows the number of participants from different disciplines.

Using *t*-tests, results revealed a significant improvement in posttest scores. See results in Table 2. For the in-person seminar/live webinar the pretest mean was 42% and the posttest mean was 70% with p < .0001. A two-way ANOVA revealed that this improvement did not vary by profession (by test of interaction, p > .7).

Approximately 79% of participants indicated that they would make a change in their practice as a result of participating in the in-person half-day seminar/live webinar. Approximately 65% of these participants responded with the highest level confidence and commitment that they would implement a change.

DISCUSSION

Maintaining good oral health is a critical factor in maintaining overall health and well-being in older adults. The provision of routine mechanical oral hygiene aids in preventing pneumonia in LTC residents and may prevent one in 10 deaths from this respiratory condition in dependent residents (Sjorgen et al., 2008). Improved oral hygiene and frequent professional oral health care reduces the progression or occurrence of respiratory diseases in high-risk elderly adults (Azarpazhooh, & Leake, 2006). Improving oral

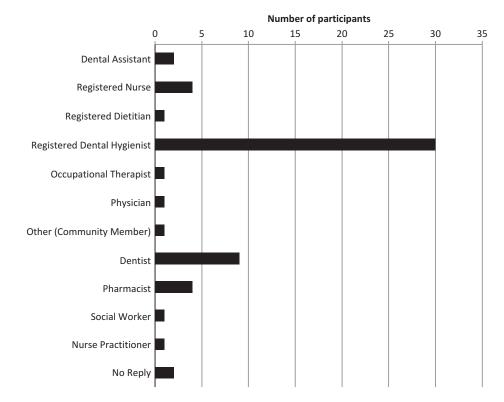


FIGURE 2 Variance in disciplines of attendees for the half-day in-person seminar/webinar.

health in older adults saves more than \$4 billion in annual treatment costs (Dolatowski, 2013). Treatment and control of periodontal disease has been shown to improve glycemic control in diabetic patients (Steward, Wagner, Friedlander, & Zadeh, 2001). All of these findings support the need to increase direct health care provider knowledge pertaining to the provision of proper oral care of elders residing in LTC facilities and the community.

Research findings indicate utilizing IPE supports an increase in knowledge and an improvement in critical thinking skills (Edwards & Smith, 1998).

TABLE 2 Knowledge Gained: Half-Day In-Person Seminar/Live Webinar: Comparison ofAverage Scores From Pre- and Posttest Scores

Course pre–post	М	SE	95% CI	<i>p</i> value
Half-day in-person sem	inar/live webina	(June 1, 2012)		
Pre	51.6	2.41	[46.9, 56.4]	
Post	73.5	2.64	[68.3,78.7]	<.0001

Note. Pre = pretest knowledge; Post = Posttest knowledge; SE = standard error of the mean; CI = 95% confidence interval; *p* value=result from comparing the two groups on a *t* test comparison of the means.

Utilizing an IPE approach to oral health care will assist in addressing preventable health problems in older adults residing in LTC care facilities and the community.

For this investigation, concepts from Level 2 of the Kirkpatrick (1996) four-level evaluation of training model were used to evaluate the impact of an IPE program implemented in a LTC facility. The four levels of the model consist of (a) reaction, which is a measure of how participants feel about the training; (b) learning, which is a measure of the knowledge acquired, skills improved, or attitudes changed due to training; (c) behavior, which is a measure of what extent to which behavior of participants changes; and (d) results, which is a measure of final results that occurred due to the training (Kirkpatrick, 1996). Level 2 best addressed the specific aim of this study, which was to determine if using this type of educational approach to oral health care improved knowledge of the geriatric work force and encouraged change in patient care provided.

In this investigation, the use of an IPE approach was evaluated, and findings confirmed an increase in knowledge presented by participants. Concepts from Level 2 of the Kirkpatrick (1996) model stress the importance of determining the amount of learning that takes place in training programs. Kirkpatrick defines learning as what principles, facts, and techniques were understood and absorbed by trainees, with no concern for the on-the-job use of the principles, facts and techniques. Level 2 of the Kirkpatrick model supports the use of a measurement before and after the training. In the inservice training sessions and the in-person seminar/live webinar, there was a significant difference between the pre- and posttest results. For the inperson seminar/live webinar, this improvement did not vary by profession. A comparison of change from one discipline to another could not be made for the five in-service training sessions as no item pertaining to discipline was included on each test, and not all participants indicated their discipline upon sign-in. However, the five in-service training sessions were mandatory for members of the nursing staff. It can be inferred that the nonresponding participants were members of the nursing field. Addressing these limitations in future studies will assist with adequate analysis and comparisons providing more precise results to glean from. Findings are still useful with regard to the purpose and specific aim of this investigation.

From their knowledge gained, participants of the IPE program evaluated in this study listed changes they planned to implement in patient care. CNAs are primarily responsible for assisting with or performing routine oral care for residents. Of the CNAs that participated and responded to the course evaluation tool, 57% listed changes in patient care that indicated they would perform better routine oral care and 43% listed changes in patient care that indicated they would routinely include assessing for oral changes. All participants, who were head nurses of the LTC facility hosting the program, listed changes in formal structure to include an oral health care component indicating that they would implement training of staff members. These findings reflect the concept of attitudes changed due to training from level two of the Kirkpatrick (1996) evaluation of training model.

Statistical analyses, stemming from data collected from the five inservice training sessions and the one half-day in-person seminar/live webinar yielded results that support the use of an IPE approach to oral health care in the geriatric population. The aforementioned findings along with the high percentage of participants, from the in-service trainings, and the inperson/live webinar, indicating a change in care to be implemented, support that the knowledge gained through this project will support improvement in patient outcomes. Results indicate that the IPE approach used in this educational program is an important component for improving geriatric work force development.

An IPE approach, with an emphasis on prevention, enables individuals from different disciplines to share their expertise. This approach enhances care provider knowledge from an overall health perspective encouraging the use of collaborative care to address preventable health problems. The impact of an IPE approach, like the one evaluated in this study, which utilizes presenters from five different fields of expertise teaching and learning from a mixed audience of direct health care providers while addressing oral health care in LTC facilities, is a topic that is not well studied resulting in minimal data published. The minimal data available for this type of approach, supports the fact that the IPE program for oral health care in LTC settings implemented and evaluated in this investigation is unique and not routinely utilized. Findings from this study are significant because they add to the limited data available on this type of IPE approach. Using this type of innovative educational approach in LTC settings and in the community would have a positive impact on delivery of patient care to elders. This educational approach encourages patient assessment to include oral health and supports implementing a team approach to overall patient care.

The LTC facility, where this IPE program was held, has implemented this unique model of utilizing an IPE approach to oral health to assist in addressing the overall health of its residents. This approach increases oral health care knowledge of caregivers and encourages a change in patient care and can be implemented in other facilities. A follow-up study will consist of comparing the oral health status of residents seen in the dental clinic at this LTC facility before the IPE in-service trainings with the oral health status of the same residents seen in the dental clinic after the in-service training of direct health care providers. The oral-health training provided in the evaluated IPE program will serve as the intervention. Findings will aid in determining if a change in patient care was implemented by direct health care provider staff as a result of knowledge gained from the in-service training.

The older adult population is increasing in size and the number of nursing home residents is anticipated to grow. Much oral disease is preventable or at least controllable and substantial medical cost savings are possible. Knowledge gained by direct health care providers through an IPE approach, such as the one implemented at the referenced LTC facility, will encourage the provision of proper oral care and assist in preventing or reducing oral health and overall health issues supporting a decrease in health care costs. Results from this investigation indicate that the unique IPE approach used for the in-service training sessions and the in-person seminar/live webinar supported development of the geriatric work force and will assist in meeting the oral health care needs of the geriatric population, improving patient quality of life. These findings support and build on research findings of others emphasizing the importance and development of IPE approaches to be incorporated in geriatric dental education.

REFERENCES

- Administration on Aging (AoA), U.S. Department of Health and Human Services (USDHHS). (2010). *A profile of older Americans: 2010*. Retrieved from http://www.aoa.gov/aoaroot/aging_statistics/profile/2010/docs/2010profile.pdf
- American Dental Association (ADA). (2012). Interprofessional Education Collaborative launched. ADA News. Retrieved from http://www.ada.org/ news/6865.aspx.
- American Dental Educators Association (ADEA). (2011). Introducing interprofessional education to dentistry and dentistry to interprofessional education: A long and winding road, but well worth the trip. *Bulletin of Dental Education, 44*(4). Retrieved from http://info.adea.org/BDE/Publications/ Volume_44/Issue_4/Introducing_Interprofessional_Education_to_Dentistry_ and_Dentistry_to_Interprofessional_Education_A_Long_and_Winding_Road,_ but_Well_Worth_the_Trip/.
- Azarpazhooh, A., & Leake, J. L. (2006). Systematic review of the association between respiratory diseases and oral health. *Journal of Periodontology*, 77, 1465–482.
- Bailey, R., Gueldner, S., Ledikwe, J., & Smiciklas-Wright, H. (2005). The oral health of older adults: An interdisciplinary mandate. *Journal of Gerontological Nursing*, 31, 11–17.
- Boehm, T. K., & Scannapieco, F. A. (2007). The epidemiology, consequences and management of periodontal disease in older adults. *Journal of the American Dental Association*, 138, 268–338.
- Center for the Advancement of Interdisciplinary Education. (2013). *Defining IPE*. Retrieved from http://www.caipe.org.uk/about-us/defining-ipe/
- Centers for Disease Control (CDC). (2001). *The oral health of older Americans*. Retrieved from http://www.cdc.gov/NCHS/data/ahcd/agingtrends/03oral.pdf
- Cohen-Mansfield, J., & Lipson, S. (2002). The underdetection of pain of dental etiology in persons with dementia. *American Journal of Alzheimer's Disease & Other Dementias*, 17, 249–253.
- Coleman, P., & Watson, N. M. (2006). Oral care provided by certified nursing assistants in nursing homes. *Journal of the American Geriatrics Society*, 54(1), 138–143.

- Cunha-Cruz, J., Hujoel, P. P., & Nadanovsky, P. (2007). Secular trends in socioeconomic disparities in edentulism: USA, 1972–2001. *Journal of Dental Research*, *86*, 131–136.
- DeBiase, C. B., & Austin, S. L. (2003). Oral health and older adults. *Journal of Dental Hygiene*, 77, 125–146.
- Dolan, T. A., Atchison, K., & Huynh, T. N. (2005). Access to dental care among older adults in the United States. *Journal of Dental Education*, 69, 961–974.
- Dolatowski, T. (2013). *Confronting the burden of dental disease: Employers hold key to lessening the effects*. Oakbrook, IL: Delta Dental Plans Association. Retrieved from http://www.deltadental.com/DID_LessenBurdenDisease.pdf
- Donaldson, K. (2011). Are we ready to care for advanced periodontitis in an aging America? *RDH*, *31*(8), 54–56, 94.
- Edwards, J., & Smith, P. (1998). Impact of interdisciplinary education in underserved areas: Health professions collaboration in Tennessee. *Journal of Professional Nursing*, 14, 14–149.
- Ellis, A. G. (1999). Geriatric dentistry in long-term-care facilities: Current status and future implications. *Special Care Dentistry*, *19*, 139–142.
- Ettinger, R. L. (2012). A 30-year review of a geriatric dentistry teaching programme. *Gerodontology*, 29(2), e1252–1260.
- Ettinger, R. L., Watkins, C., & Cowen, H. (2000). Reflections on changes in geriatric dentistry. *Journal of Dental Education*, 64, 715–722.
- Fulmer, T., Hyer, K., Flaherty, E., Mezey, M., Whitelaw, N., Jacobs, M. O., . . . Pfeiffer, E. (2005). Geriatric interdisciplinary team training program: Evaluation results. *Journal of Aging and Health*, 17, 443–470.
- Genco, R., Offenbacher, S., & Beck, J. (2002). Periodontal disease and cardiovascular disease: Epidemiology and possible mechanisms. *Journal of the American Dental Association*, 133, 148–228.
- Guay, A. H. (2005). The oral health status of nursing home residents: What do we need to know? *Journal of Dental Education*, *69*, 1015–1017.
- Gurenlian, J. R. (2006). Inflammation: The relationship between oral health and systemic disease. *Access*, 20(4) (Suppl. 1), 1–12.
- Haddad, A. R., Coover, K. L., & Faulkner, M. A. (2011). Development and incorporation of an interprofessional experience into a geriatric pharmacy elective: The first-year experience. *Currents in Pharmacy Teaching and Learning*, *3*, 116–122.
- Hein, C., Schönwetter, D. J., & Iacopino, A. M. (2011). Inclusion of oral-systemic health in predoctoral/undergraduate curricula of pharmacy, nursing, and medical schools around the world: A preliminary study. *Journal of Dental Education*, 75, 1187–1199.
- Interprofessional Education Collaborative Expert Panel. (2011). Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, DC: Interprofessional Education Collaborative. Retrieved from http://www.aacn.nche.edu/education-resources/IPECReport.pdf
- Jablonski, R. A., Munro, C. L., Grap, M. J., Schubert, C. M., Ligon, M., & Spigelmyer, P. (2009). Mouth care in nursing homes: Knowledge, beliefs, and practices of nursing assistants. *Geriatric Nursing*, 30(2), 99–107.
- Kirkpatrick, D. (1996). Great ideas revisited. *Training and Development*, 50(1), 54–59.

- Lamster, I. (2001). Oral health care services for older adults: A looming crisis. *American Journal of Public Health*, 94, 699–701.
- Le, P., Dempster, L., Limeback, H., & Locker, D. (2012). Improving residents' oral health through staff education in nursing homes. *Special Care Dentistry*, 32, 242–250.
- Mohammed, A. R., Preshaw, P. M., & Ettinger, R. M. (2003). Current status of predoctoral geriatric education in U.S. dental schools. *Journal of Dental Education*, 67, 509–514.
- Murray, P. E., Ede-Nichols, D., & Garcia-Godoy, F. (2006). Oral health in Florida nursing homes. *International Journal of Dental Hygiene*, *4*, 198–203.
- Nederfors, T., Paulsson, G., Isaksson, R., & Fridlund, B. (2000). Ability to estimate oral health status and treatment need in elderly receiving home nursing: Comparison between a dental hygienist and a dentist. *Swedish Dentistry Journal*, 24, 105–116.
- Nicol, R., Sweeney, M. P., McHugh, S., & Bagg, J. (2005). Effectiveness of health care worker training on the oral health of elderly residents of nursing homes. *Community Dentistry and Oral Epidemiology*, 33, 115–124.
- Padilha, D. M., Hilgert, J. B., Hugo, F. N., Bos, A. J., & Ferrucci, L. (2008). Number of teeth and mortalilty risk in the Baltimore longitudinal study of aging. *Journals* of Gerontology, Series A, Biological Sciences and Medical Sciences, 63, 739–744.
- Ries, L. A., Kosary, C. L., Hankey, B. F., Miller, B. A., Clegg, L., & Edwards, B. K. (Eds.). (1999). SEER cancer statistics review, 1973–1996. Bethesda, MD: National Cancer Institute.
- Sjogren, P., Nilsson, E., Forsell, M., Johansson, O. & Hoogstraate, J. (2008). A systematic review of the preventive effect of oral hygiene on pneumonia and respiratory tract infection in elderly people in hospitals and nursing homes: Effect estimates and methodological quality of randomized controlled trials. *Journal of American Geriatric Society*, 56, 2124–2130.
- Steward, J. E., Wagner, K. A., Friedlander, A. H., & Zadeh, H. H. (2001). The effect of periodontal treatment on glycemic control in patients with type II diabetes mellitus. *Journal of Clinical Periodontology*, 28, 306–310.
- Terpenning, M. (2005). Geriatric oral health and pneumonia risk. *Clinical Infectious Diseases*, 40, 1807–1810.
- Terpenning, M., & Shay, K. (2002) Oral health is cost-effective to maintain but costly to ignore. *Journal of American Geriatric Society*, 50, 584–585.
- Terpenning, M. S., Taylor, G. W., Lopatin, D. E., Kerr, C. K., Dominguez, B. L., & Loesche, W. J. (2001). Aspiration pneumonia: Dental and oral risk factors in an older veteran population. *Journal of the American Geriatrics Society*, 49, 557–563.
- U.S. Census Bureau. (2010). *Older Americans month: 2010*. Retrieved from http://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb10-ff06.html
- U.S. Code Collection, Title 42, Chapter 7, Subchapter XIX § 1396r. (2010). Retrieved from http://www4.law.cornell.edu/uscode/42/1396r.html
- U.S. Department of Health and Human Services (USDHHS). (2000). Oral health in America: A report of the Surgeon General. Rockville, MD: Author, National Institute of Dental and Craniofacial Research, National Institutes of Health.

- Waldrop, D. P., Fabiano, J. A., Nochajski, T. H., Zittel-Palamara, K., Davis, E. L., & Goldberg, L. J. (2006). More than a set of teeth: Assessing and enhancing dental students' perceptions of older adults. *Gerontology & Geriatrics Education*, 27(1), 27–56.
- Watts, A., Crimmins, E. M., & Gatz, M. (2008). Inflammation as a potential mediator for the association between periodontal disease and Alzheimer's disease. *Neuropsychiatric Disease and Treatment*, 4, 865–876.
- Wilder, R. S., O'Donnell, J. S., Barry, J. M., Galli, D. M., Hakim, F. F., Holyfield, L. J., & Robbins, M. R. (2008). Is dentistry at risk? A case for interprofessional education. *Journal of Dental Education*, 72(11), 1231–1237.
- World Health Organization (WHO). (2010). *Framework for action on interprofessional education and collaborative practice*. Retrieved from http://www.who.int/hrh/resources/framework_action/en/.