

IMPLEMENTING AN EVIDENCE-BASED ORAL HEALTH ASSESSMENT TOOL (OHAT)
IN A NURSING HOME

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ABSTRACT

Literature substantiates that there is a relationship between poor oral health and cardiovascular risk, uncontrolled diabetes, aspiration pneumonia, poor nutritional status, and poor social life for the older adults, especially those residing in nursing homes. Recognizing the impact of poor oral health and putting protocols in place to improve oral health status is a safe and cost effective intervention.

This Practice Improvement Project (PIP) introduces and pilots a regular oral health assessment system into the care of residents in the nursing home. Four study questions were posed. These questions were: 1) how does an education intervention on the “Importance of Oral Health” increase nursing staff’s knowledge of oral health in the elderly; 2) what impact does the use of Oral Health Assessment Tool (OHAT) have on resident assessment, documentation, and referral; 3) what are nursing staff and nurse practitioners’ (NP) views of OHAT in assessing a resident’s oral health status; 4) How does the brochure “My Mouth is Part and Parcel of My Health” impact the willingness of families to seek dental services for their loved ones living in the nursing home?

This project was conducted in four phases. These phases were; 1) introduction of (OHAT) to nurse practitioners, nurses, and resident assistants and educating family members and nursing staff about the importance of oral health; 2) use OHAT for three months to assess oral health status of residents; 3) chart reviews to answer question two; and 4) survey nursing staff about their perceptions of OHAT.

A comparison of pre-test versus post-test indicated improved knowledge (p-value <0.0001). During the three-month implementation, there was noted to be more documentation in

residents' charts in relation to oral health. Nursing staff viewed OHAT as an efficient tool to use. In addition, the NP was willing to prescribe OHAT in the nursing home for nursing staff to use.

This project highlights that health care providers are willing to learn ways of improving care for residents in nursing homes. The findings support existing literature that increased knowledge about evidenced-based best practices is a factor in better oral health.

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CHAPTER I. INTRODUCTION

In the United States (U.S.), the geriatric population is the most rapidly growing of any age category (U.S.Census Bureau, 2010). The rapid growth of the geriatric population calls for healthcare providers to constantly search for ways to provide better and more comprehensive care for the elderly. This practice improvement project focused on one health care aspect (oral health) that this author believes is critical to the quality of life of the elderly. The topics that are covered in this paper include background and significance of the project, purpose of the project, literature review, design of the project, implementation, and evaluation of the project.

Background

With scientific advances, improved technology in medicine, elevated fertility after World War II, and more research information on the aging process, life expectancy internationally is expected to increase by 20 years between 2010 and 2030 (U.S Bureau, 2011). By the year 2050, the average life expectancy world-wide is projected to extend by another 10 years. According to the CDC (2003), between 2000 and 2030, the worldwide population aged 65 years and above is projected to increase by approximately 550 million to 973 million. This will be an increase from 6.9% to 12% worldwide.

In the United States alone, the number of people aged 65 years or older is expected to increase from approximately 35 million in 2000 to an estimated 71 million in 2030, while the number of people aged 80 years or older is expected to increase from 9.3 million in 2000 to 19.5 million in 2030 (U.S Census Bureau, 2011). In 2000, 14.7% of the North Dakota population was comprised of elderly adults. However, this number was projected to increase by 58% over 20 years (North Dakota State Data Center, 2010). Due to advanced scientific research in medicine, more elderly people with chronic disease are living longer compared to past decades.

Bodenheimer, Chen, and Bennett (2009) indicated that expenses related to chronic diseases of the increasing aging population are a growing burden for the U.S. This study also indicates that the U.S. spends most of their health care dollars on chronic diseases. Furthermore, the amount of dollars spent on chronic disease conditions is projected to drastically increase by 2030. Some of the common chronic diseases afflicting the population aged 65 and above include, but are not limited to: cancers, hypertension, diabetes, pulmonary conditions, heart disease, stroke, and mental disorders (Bodenheimer et al, 2009).

Most of these common chronic diseases affecting the elderly population are closely associated with poor oral health as a risk factor. The relationship between poor oral health and some of the above mentioned chronic conditions is discussed further in the review of literature. Similarly, poor oral care leads to periodontal diseases that pose threats for individuals who already have chronic diseases such as diabetes and respiratory infections (Seymour, Ford, Cullinan, Leishman, & Yamazaki, 2007). Bodenheimer et al, (2009) illustrated that pulmonary conditions accounted for 31% of chronic diseases in the U.S. in 2003 and cost the U.S. \$139 billion. In addition, by 2030, pulmonary conditions are projected to cost the United States \$384 billion. Bodenheimer et al (2009) projected similar incremental increases in other chronic diseases. Aspiration pneumonia is one of the major diseases that are frequently seen in the elderly with poor oral care, and deaths from aspiration pneumonia could be substantially decreased when adequate oral health is administered (Yoneyama, Yoshida, Ohruai et al, 2002). Terpenning, Taylor, and Lopatin (2001) found that approximately 200,000 cases of aspiration pneumonia occur each year in the United States and account for approximately 15,000 deaths annually. Poor oral health is one of the risk factors for aspiration pneumonia; therefore, preventive care measures for oral health can reduce the number of elderly individuals with

pneumonia, and reduce the overall costs for pulmonary conditions and chronic diseases treatment.

As people age and become increasingly dependent, they move to residential care facilities, such as nursing homes. Stein and Henry (2009) found that 72% to 84% of nursing home residents with natural teeth have difficulty brushing their teeth, and about 94% of residents with dentures have difficulty cleaning their own dentures due to musculoskeletal limitations related to aging. Therefore, these individuals are dependent on nursing staff for the provision of basic care, including oral care. Whitman and Whitman (2006) reported that the number of edentulous elderly residents living in the nursing home has decreased by 80% since the 1980s. According to the 2010 ranking published in the American Nurse Today, in North Dakota 49.6% of adults aged 65 years and older have lost 6 or more of their teeth due to dental decay and gum disease (American Nurse Today, 2010).

Definition of Terms

Edentulous – Edentulous is the state of having no teeth (MacEntee, Muller, & Wyatt, 2010).

Medicaid – Medicaid is a federal medical health program that offers services to families with few resources or low income. Although the program is federally managed, each state establishes its eligibility criteria and scope of services. (Medicaid.gov, 2007).

Medicare – Medicare is a federal health insurance program that provides hospital and medical insurance to the elderly and some of the disabled individuals (Medicare.gov, 2007).

Minimum Data Set (MDS) - The MDS is a standardized assessment tool that facilitates care management in nursing homes as required by the Center for Medicare and Medicaid Services (CMS) (CMS, 2011).

Nursing staff – Nursing staff in this paper will refer to nurses and nursing assistants or resident assistants (Operational definition).

Periodontitis – Periodontitis is the inflammation around the tooth (MacEntee, Muller, F., & Wyatt, 2010).

Significance

Many studies have indicated an association between poor oral health and serious respiratory infections like pneumonia (Adachi, Ishihara, Abe, and Okudu, 2007; Awano et al, 2008; Pace and McCullough, 2010). According to Pace and McCullough (2010), poor oral care leads to growth and multiplication of respiratory microorganisms that, when aspirated, can be especially dangerous for individuals who are immunocompromised, such as the elderly. Healthy people 2020 supported these findings by including oral health and access to preventive services for older adults in its objectives (HealthyPeople.gov). However, Coleman and Watson's (2006) study demonstrated that oral hygiene is a neglected area among staff in nursing homes for a variety of reasons ranging from lack of interest to lack of supplies. They also (2006) investigated and reported on actual daily oral care for the dentate residents among selected nursing homes in New York. The study established that out of the 47 nursing assistants who were blinded to the study, adherence to the guidelines and standards of oral care was low, with a range of 0% to 16%. While 16% of the residents had their teeth brushed and rinsed with water, only one resident had their tongue cleaned (Coleman & Watson, 2006). In addition, as required by proper protocol, neither of the nursing assistants brushed the teeth for at least 2 minutes, flossed residents teeth, assessed the oral mucosa, rinsed with mouth wash or wore clean gloves during oral care. The most astonishing data reported by Coleman and Watson (2006) was that nursing assistants never

wore clean gloves and often performed oral care after cleaning the perineal area or changing soiled garments.

Lack of knowledge about the importance of oral hygiene, lack of time, and combativeness of dementia residents are among the barriers for adequate oral hygiene for elderly patients living in nursing homes (Shay, 2007). Salivary counts for lactobacilli and certain yeast have shown to be low in edentulous mouths, but higher upon insertion of dentures, which indicates that dentures serve as mechanisms to retain microorganisms (Pace & McCullough, 2010). The type of microorganisms that may thrive in one's mouth depends on whether a person has full dentures, is partially edentulous, wears partial dentures, or if a person is dentate (Pace & McCullough, 2010).

Pace and McCullough's study can assist nurses working with elderly individuals to develop interventions that are appropriate and individualized to each elderly person. Sumi, Miura, Michiwaki, and Uematsu (2006) showed that bacteria that commonly cause respiratory infection colonize the tongues of the nursing home residents, suggesting that the tongue may function as a reservoir of potential respiratory pathogens to facilitate colonization on the oropharynx. In addition, poor oral hygiene can impact the patient's ability to eat, talk and socialize. With mounting evidence linking oral health to common chronic diseases and increasing costs for management of chronic diseases, health care professionals caring for older adults, need to close the gap between research and practice.

Nurse practitioners prepared at the doctoral level are especially encouraged to manage the growing number of chronic diseases since they have a broad scope of practice and provide primary care for significantly growing numbers of older adults living not only in a community setting, but in nursing homes as well. Significantly, advanced practice nurses can collectively

impact change in the elderly population's health by promoting improved oral care both in older adults and their families as well, and also by initiating change in health care facilities through advocating for utilization of evidence based guidelines. As nurse practitioners care for nursing home patients with diabetes, pneumonia or cardiovascular disease, they should think of other factors that can complicate these conditions. Poor oral health is one of the risk factors.

Problem Statement

With mounting evidence linking oral health to common chronic diseases and the increasing costs for management of chronic diseases, health care professionals need to close the gap between research and practice. However, studies show that health care providers are paying little attention to oral health in nursing homes (Coleman & Watson, 2006; Jablosnki, Munro & Grap et al, 2005, 2009). In addition, MacEntee et al (2011) found in their review that best practices to guide oral care and protocols for screening and monitoring oral health for non-dental professionals are lacking in nursing homes.

Currently, all nursing homes receiving Medicaid or Medicare funding utilize a comprehensive health assessment protocol known as 'Minimum Data Set (MDS) 3.0' as required by the Omnibus Budget Reconciliation Act (OBRA) of 1987 in assessment of residents during admission, quarterly and upon return from hospital. The MDS is a standardized assessment tool that facilitates care management in nursing homes as required by the Center for Medicare and Medicaid Services (CMS) (CMS, 2011). The MDS assessment is completed by nurses on all residents and includes an oral health component that must be completed within 14 days of admission to a facility (Brown, 2003). Paul, Thai, Stephen, Shuman, Gestur, Davidson (1997) identified that by use of MDS assessment, nurses identified few oral health problems, and that problems identified did not translate into treatment. A more recent study showed that nursing

assessments are not always compatible with the documentations in MDS (Munoz, Touger-Decker, Byham-Gray, & Maillet, 2009). This study validates a need for a more standardized tool for oral health assessment and screenings for non-dental professionals. Referencing to the above studies, supplementing MDS assessments with evidence-based oral health assessment tool could improve the general health of residents and also boost nurses' confidence in assessing oral health.

Chalmers, King, Spencer, Wright and Carter (2005) cited in their study that, to develop a successful residential dental program, a regular system of oral assessments for all residents by use of an explicit, systematic, and routinized assessment plan is important. The Oral Health Assessment Tool (OHAT) has been shown to be an easy and reliable tool that nursing staff can use to assess oral health for the residents (Chalmers et al., 2005). The data collected by use of OHAT can be used to adjust oral hygiene care plans for the residents. In addition, given that the majority of oral hygiene for a resident is performed by resident assistants, close supervision by nurses is paramount. One way of ensuring continued supervision could be by a medical order to use OHAT throughout the stay of residents in nursing homes.

Literature about implementing OHAT into the nursing home' culture and the effect of utilizing OHAT systematically on the number of oral health problems identified and treated is scarce, and thus leading to the overall goal of this project. In addition, there is a gap about nurse practitioner's perceptions of OHAT use in the nursing home.

Purpose of the Project

The purpose of this project was to introduce and pilot a regular system of oral health assessment into the care of nursing home residents. This project includes four phases, with the first phase providing an introduction to an evidence-based Oral Health Assessment Tool (OHAT)

by an advanced practice nursing student to nursing staff at a nursing home and educating nursing home staff and family members about the importance of oral health; the second phase involved an evaluation of the nursing staff's and nurse practitioner's perceptions of OHAT as a guide for assessing oral cavity; and the third phase evaluated the practicality and expediency of incorporating the tool with their nursing assessments. Finally, this study was designed to ascertain whether the use of the tool increased the number of documentation entries about oral health and treated/referred for oral health problems through chart reviews.

Application to the DNP Role

Doctoral- prepared nurse practitioners have a long list of roles in practice. Advanced practice nurses (APRN) are not only leaders and educators in practice but they are also advocates for patients. This project is built around the role of an APRN as an educator and as an advocate for the geriatric population. As an educator, the APRN acknowledges that oral health in the elderly population living in a nursing home is a neglected area and develops ways to creating awareness in patients, healthcare providers, and families on the importance of oral health. On the other hand, as an advocate in a leadership role, the APRN can step in to provide practical methods to improve oral health conditions of the elderly patients living in the nursing homes. Introducing health care providers to OHAT and educating family members are among the many ways that APRN can provide leadership and advocacy for the geriatric population.

Nurse practitioners often see patients in long term care facilities for either acute or chronic diseases. As a primary care provider, nurse practitioners need to ensure that their patients are receiving basic, holistic care, which must include oral hygiene. Nurse practitioners can encourage nurses and caregivers participating in the care of their patients, to utilize evidence based tools, such as OHAT to achieve holistic comprehensive care of patients that involves all

levels of care including primary, secondary, and tertiary care. In addition, the assessment findings from the evidence-based assessment tool could be used by nurse practitioners to evaluate whether oral problems are contributory in the current problems which patients are receiving treatment. A positive finding would leave the practitioner with resources to address the issue.

Study Questions

1. How does the education intervention on the “Importance of Oral Health” increase the nursing staff’s knowledge of oral health in the elderly?
2. What impact does the use of OHAT have on resident assessment, documentation, and referral?
3. What are nursing staff’s and nurse practitioners’ views on OHAT in assessing a resident’s oral health status?
4. How does the brochure “My Mouth is Part and Parcel of My Health” impact the families’ willingness to seek dental services for their loved ones living in the nursing home?

CHAPTER II. LITERATURE REVIEW

A report by the Surgeon General defines oral health as being “free of chronic oral-facial pain conditions, oral and pharyngeal cancers, oral soft tissue lesions, birth defects such as cleft lip and palate, and scores of other diseases and disorders that affect the oral, dental, and craniofacial tissues” (Satcher, 2000, pg. 11). In other words, oral health goes beyond healthy teeth. The mouth is a readily visible part of the body and provides health care providers with ideas about the general health of the patient. It is a reflection of the events inside the body so could be seen as a health barometer or systemic health indicator, making it an important component to health promotion and disease prevention. This chapter will focus on a literature review that will answer the following questions:

- What is the relationship between oral health and systemic diseases?
- What is the relationship between oral health and nutrition?
- What factors generally impact oral health in elderly patients?
- What do studies illustrate about oral hygiene in long term care facilities?
- What evidence-based oral health assessment tools are available for assessing oral health status in older adults by non-dental health professionals?

In addition to the above questions, the chapter will include a description of the theoretical framework used to guide the study.

Poor Oral Health and Systemic Diseases

According to the American Academy of Periodontology (AAP), periodontal diseases have been linked to Coronary Heart Disease (CHD) and stroke (AAP, 2011). There are two theories that have been widely accepted to explain the link between oral pathogens and CHD and stroke. One theory explains that oral pathogens directly enter the blood stream and attach to the

fatty plaques in coronary arteries, hence contributing to clotting in arteries (AAP, 2011). Another theory explains that inflammatory mediators in periodontal disease can contribute to plaque build-up and hardening on the arteries (AAP, 2011). A recent systematic review of periodontal interventional studies concluded that treatment of periodontal infections results in lower levels of systemic inflammation and inflammatory markers such as C-reactive protein (CRP), fibrinogen, and leukocyte counts (Kebschull, Demmer & Papapanou, 2010). The three indicators are risk markers in cardiovascular disease. Elevated fibrinogen specifically promotes coronary artery thrombosis (Fogoros, 2011). Furthermore, severe gingivitis was linked to higher inflammatory markers in patients which lead to increased risk factors for cardiovascular disease (Kebschull et al., 2010; Janket et al., 2004).

Oral bacteria such as *Porphyromonasgingivalis* and *Streptococcus sanguis* have been associated with atheroma formation and thrombocytic aggregation in coronary arteries respectively (Meurman & Hamalainen, 2006). Although the review by Meurman and Hamalainen (2006) concluded that studies indicating the relationship between periodontal disease and CHD are weak and based on very few studies, there is still sufficient literature contributing to the fact that poor oral health is associated with CHD. A study to ascertain the relationship between the asymptomatic dental score (ADS) and prevalence of CHD revealed that a higher (ADS) was associated with the prevalence of CHD (Janket et al., 2004). One of the most recent reviews concluded that periodontal disease is a risk factor or marker for CHD and is independent of traditional CHD risk factors (Humphrey, Fu, Buckley, Freeman, & Helfand, 2008). A study to test the hypothesis that periodontal disease may contribute to the increased mortality associated with diabetes indicated that diabetes-subjects with severe periodontal disease were 3.2 times at risk for cardiorenal mortality and diabetic nephropathy compared to

counterparts who had no, mild or moderate periodontal disease (Saremi et al., 2005). Periodontal disease can also adversely affect glycemic control in diabetic patients (Taylor & Borgnakke, 2008). A study to determine the impact of periodontitis on inflammatory status and type 2 diabetes control found that patients with periodontitis had higher fasting blood sugars, higher hemoglobin A1C levels, and β -cell dysfunction than type 2 diabetes patients without periodontitis (Matthews, Halloran, Griffiths, & Chapple, 2011). An update for health care professionals about diabetes and periodontal disease called for collaboration between health care providers and dental professionals (Rutger, 2011). Rutger (2011) reported that type 2 diabetic patients with periodontal disease and hemoglobin A1C levels greater than 9% can reduce their hemoglobin A1C levels by 0.6% if periodontal interventions are provided. In addition, if medication adjustment is added to periodontal intervention, hemoglobin A1C may be reduced by approximately 1.4% (Rutger, 2011). With evidence that oral health is linked to common chronic diseases, health care professionals, especially nurse practitioners caring for older adults, need to take action.

Poor oral health has been linked to other systemic diseases besides CHD and diabetes. Nursing home-acquired pneumonia is one of the most common infectious disease in long term care facilities and one of the significant causes of morbidity and mortality (Cunha, 2011). El-Solh (2011) reported that ineffective clearing of mucus from the respiratory tract of older people living in nursing homes particularly predisposes them to pneumonia. Bacterial colonization of the oral cavity followed by aspiration into the lower respiratory tract is the leading path of infection for typical pneumonia (El-Solh, 2011).

Quagliarello et al. (2005) specifically identified poor oral hygiene and difficulty swallowing as the common modifiable risk factors of pneumonia. In Quagliarello's study (2005),

112 nursing home residents out of 613 developed a documented case of pneumonia. Of the 112 cases, 21% could have been prevented if oral care was adequately provided and if difficulty swallowing was not present. Sumi, Miura, Nagaya, Michiwaki, and Uematsu (2006) investigated the microflora of the tongue of 69 nursing home residents with the aim of identifying oral infectious pathogens that potentially cause respiratory diseases in nursing home residents. The 69 residents who participated in the study were dependent on nursing assistants for oral hygiene. Respiratory pathogens were found to have colonized in 41 of the nursing home residents. The most predominant microorganisms identified were *Haemophilus parainfluenzae*, colonizing in 29% of the residents, with *klebsiella pneumonia* and *Staphylococcus aureus* each colonizing 16% of residents' tongues. The above referenced study demonstrated how the tongue can be a reservoir for pneumonia-causing microorganisms. Both Sumi et al's and Quagliarello et al's studies provide evidence as to why oral health is central to prevention of nursing home-acquired pneumonia.

Aspiration of pathogens while sleeping is one of the ways oral pathogens find their way to the lungs. Awano et al. (2008) evaluated the relationship between oral status and the four-year mortality rate from aspiration pneumonia and found that mortality from aspiration pneumonia was associated with dental disease. The study's participants were elderly adults residing in the community instead of institutionalized elderly residents. However, Awano et al.'s (2008) study is relevant to highlight that poor oral health is contributory to adverse outcomes.

Poor Oral Health and Nutrition

The consequences of poor oral health to the human body as well as the oral cavity can be detrimental, and can also cause an individual to be selective with food intake. Coleman (2002) indicates that tooth loss, dental carries, periodontal disease, denture stomatitis, and xerostomia

can all be as a result of poor oral hygiene. Tooth loss can influence food selection, leading to a carbohydrate rich diet that lacks fiber and protein, hence putting an elderly person at risk for malnutrition and further oral health deterioration. Quandt et al. (2011) investigated the association between dry mouth, beverage intake and dietary quality in older adults in North Carolina. They found that older adults with perceived dry mouth were more likely to modify several foods and avoid certain foods. The Quandt et al.'s (2011) study concluded that dry mouth did not lead to poorer dietary quality in participants. However, dry mouth can indeed affect the dietary quality in older adults who cannot manipulate their own foods, such as the frail adults in the community and in long term care facilities. Gerdin et al. (2005) evaluated the impact of dry mouth on frail, older people in community care centers and concluded that dry mouth negatively impacts the quality of life in old, frail people. Dry mouth was associated with oral pain, self-consciousness, difficulty pronouncing words, irritability and a worsening sense of taste (Gerdin et al., 2005; MacEntee, Muller, & Wyatt 2010).

As science and technology continue to evolve, the number of edentulous older patients is decreasing. Therefore, it is important that health care professionals adopt necessary preventive measures to maintain a healthy mouth. Tooth loss and wearing dentures has been associated with poorer nutrition compared to individuals with their own teeth (Emani & Feine, 2008). When individuals lose their own teeth, they are often fitted with dentures and therefore modification of their food is not a choice-it is a must. Emani and Feine (2008) reported that several cross-sectional and longitudinal studies have demonstrated that diets of edentulous people are not only low in fiber, but also high in saturated fat. Mouth pain and tooth loss can greatly impact the patient's selection of foods which, in turn, poses a risk for malnutrition along with a negative effect on socialization.

Oral Hygiene in Long-term Care Facilities

Vissschere, Grooten, Theuniers, and Vanobbergen (2006) confirmed the hypothesis that nursing home residents have poor oral health when they investigated the level of oral hygiene in elderly people living in long-term care institutions in Belgium. Using a plaque index score with a denture score of greater than two indicating poor oral hygiene, Visschere et al.(2006) found that the mean dental plaque index and denture plaque index per subject was 2.17 and 2.13 respectively. The same study by Visschere et al. indicated that only 45% of the subjects with natural teeth had a plaque index of less than 1 and about 30% had extremely poor oral hygiene. Poor oral hygiene in nursing homes has been associated with a lack of supplies for healthcare providers as well as organizational structure in nursing homes (Jablonski et al., 2009). The Jablonski et al. study reported that 68.4% of the participating nursing assistants used toothpaste 68.4% of the time when brushing a resident's teeth and nursing assistants also reported using toothpaste 47.7% of the time on patients who wore dentures only. The use of toothpaste to clean patients' dentures highlights either a lack of supplies or lack of knowledge that toothpaste should not be used on dentures since it abrades the denture surfaces. Furthermore, although nursing assistants reported that mouth care should be provided at least twice a day, 44% of nursing assistants reported performing mouth care only once a day (Jablonski, 2009).

An observational study by Coleman and Watson in nursing homes in New York also confirmed the feared assumption that nursing home residents receive inadequate oral hygiene. Coleman and Watson (2006) observed nursing assistants provide care to 67 residents in nursing homes and compared the observational data to the data that nursing assistants recorded in residents' charts. Coleman and Watson observed that only 16% of the 67 residents received oral care with average time ranging from 1.08 minutes to 5.15. Other observations made by Coleman

and Watson (2006) included: nursing assistants positioning residents in mechanical lifts while performing oral care, documenting that oral care was provided and yet none was done, resistive behavior by residents receiving care, lack of supplies to provide adequate care and nursing assistants performing the task without informing residents. Performing a task for a resident without informing them about what is going on could be one of the many reasons why some of the elderly patients exhibit behavioral problems when receiving care. Stein and Henry (2009) advise that to promote cooperation from the residents, caregivers should communicate with residents when providing oral care. The authors add that smiling, praising and encouraging may help to promote cooperation (Stein and Henry, 2009).

A more recent study in the state of Mississippi was a reminder that oral hygiene is still a neglected area for residents living in nursing homes. The survey revealed that only 50% of the residents received regular and daily brushing of the teeth and less than 15% of the residents received daily flossing. Ironically, the same study indicated that a majority of the care givers surveyed reported that time and staffing was not a contributing factor to residents receiving inadequate dental hygiene (Howard & Sullivan, 2011). The available studies about poor oral care in long term care facilities are an appeal for healthcare professionals, especially nurse practitioners, to take action and arrest the problems. Nurse practitioners caring for the older adults living in long term care facilities can frequently assess a patient's mouth and recommend that care givers perform regular oral hygiene by writing orders for good oral hygiene.

Factors Impacting Poor Oral Health in Elderly

Several factors contribute to the poor oral health status of older adults in the U.S. Some of the factors that will be discussed in this section are: increased medication use due to chronic diseases, increased cost, and lack of knowledge of the importance of oral health (Vargas,

Kramarow, & Yellowitz, 2001). In the United States, older adults are more likely to develop chronic diseases as they age and therefore are prescribed medications to relieve pain and/ or to manage their conditions. Dry mouth is one of the common side effects of the medications that are being ingested. With dry mouth, the ability to speak, swallow, and even wear dentures are decreased (Ettinger, 2007). It is, therefore, important that health care providers pay attention to the patient's mouth condition, especially patients who have antihistamines, diuretics, antipsychotics, and antidepressant medications in their treatment regimen.

Insurance coverage is a predictor for dental care access and hence a factor that impacts oral health. While the American Dental Association recommends that older adults have regular dental visits, data from the CDC reported that only 60% of adults 65 years and older visited the dentist in 2009 (CDC, 2011). Most older adults are retired and, consequently, lose their dental coverage which is often obtained through a job benefit package. The Surgeon General's report published in 2000 added that older women are often worse off after retirement since they generally have lower incomes and may never have had dental insurance. Currently, Medicare provides very limited dental coverage and does not cover routine dental visits (Medicare, 2011). With lack of coverage, patients will most likely seek care only when most necessary – primarily to alleviate dental pain. On the other hand, Medicaid funds dental care for the disabled and elderly in certain states, but has a low reimbursement rate and therefore dentists are hesitant to treat Medicaid patients who often require extensive, as well as costly care (Department of Health and Human Services, 2010).

Lastly, lack of knowledge about the importance of oral health and how it is associated with systemic diseases is also a barrier. Furthermore, the attitudes and beliefs that tooth loss is part of the natural aging process also compounds the already complicated case of oral health in

elderly. Providers in one study identified that there was an inverse relationship between a patient's age and his or her focus on preventative care. The older the patients get, the less they are concerned with their preventative care (Robbert et al., 2006). These patients need health care providers to constantly remind them of the old truism that an ounce of prevention is better than a pound of cure.

Evidence-based Assessment Tools for Oral Hygiene

Several tools are available in literature describing how dental professionals can assess the oral health of elderly patients; however, very few valid and reliable tools are available for use by non-dental professionals in residential care settings (Chalmers et al, 2005). The Brief Oral Health Status Examination (BOHSE) and Oral Health Assessment Tool (OHAT) will be discussed as the two valid and reliable tools that comprehensively assess a variety of aspects of oral health. BOHSE oral assessment tool was developed by Dr. Kayser-Jones who is a nurse with the goal of improving oral assessment in nursing home residents. Dr. Kayser-Jones has been recognized for her research work geared towards improving health of the older adults living in the nursing homes ("Using APA", 2006). She is a fellow of the Gerontological Society of America, the American Academy of Nursing, and the American Anthropological Society ("Using APA, 2006"). The BOHSE was intended for the nursing staff and nursing assistants to better identify patients that needed referral for further treatment and also to help individualize oral hygiene care plans for residents. The BOHSE tool has 10 components that needed to be assessed. Each component has a maximum score of three points, with the highest score indicating poor oral health condition (Boltz, 2007). The components included on the BOHSE tool that must be assessed are lymph nodes, lips, tongue, cheek/roof of mouth, gums, saliva, natural teeth, artificial

teeth, chewing position, and oral cleanliness. The assessment is accomplished by use of a pen light, tongue depressor, and gauze which are readily available in almost all health care facilities.

The BOHSE tool was later adapted to OHAT in 2004 by Chalmers and colleagues because their pilot study had indicated that BOHSE was too complicated and took a long time to complete (Chalmers et al., 2005). The OHAT tool is composed of eight assessment components with a maximum of two points, with 0=healthy, 1=oral changes, and 2=unhealthy. The 8 categories to be assessed in OHAT tool were lips, tongue, gums and tissues, saliva, natural teeth, dentures, oral cleanliness, and dental pain. Although the tool was originally intended for an institutionalized setting, it has been adapted to community settings and primary care settings in Ontario, Canada.

The OHAT tool was determined to have a reliability of over 72% in a case study in Australia where 21 residential care facilities participated in the study (Chalmers et al, 2005). The OHAT in this study was used for a three month period and for a six month period to assess intra- and inter-carer reliability and concurrent validity (Chalmers et al., 2005). At the end of the study the OHAT was determined to be a reliable and valid tool for use in residential facilities and can also be used with cognitively impaired residents.

In addition, Oral Health Care Plan (OHCP) also developed and adopted into evidence-based guidelines which can be completed after assessing a residents' oral status by use of OHAT. The OHAT and OHCP were adopted in 2007 by the Registered Nurse Association of Ontario (RNAO) as part of the evidenced-based guidelines that nursing staff can use for oral health assessment. In addition to acting as a guide for nursing staff, the OHAT guides nurses on what categories of oral changes need immediate referral to the dentist/provider. On the other hand the

OHCP guides nursing staff on what interventions to implement in reference to the assessment results.

Role of Health Care Providers in Nursing Homes

The staff mix in nursing homes is diverse. It includes but limited to nursing assistants nurses, nurse practitioners, and physicians. Nursing staff in nursing homes is mainly comprised of licensed nurses and resident assistants. Licensed nurses include nurse practitioners, registered nurses (RN) and licensed practical nurses (LPN). The role of licensed nurses in long term care facilities includes, but is not limited to, assessment and referral of residents as necessary. The nurses in nursing homes also have the role of coordinating care for the residents with different providers. Keeping the residents' families involved is also part of the nurses' role in nursing homes.

Nurse practitioners in nursing homes are very critical to residents stay and care. Nurse practitioners working at a nursing home can provide preventive and acute health care services to nursing home residents. McAiney et al (2008) reported in their study that two nurse practitioners working in 22 nursing homes had over two thousand cases that they handled, and in those cases, hospital admission was prevented in up to 43% of the cases. On the other hand, nursing assistants provide basic care needs such as oral hygiene for the residents in the nursing homes. Due to their daily contact with the residents, nursing assistants will often notice a resident's change in health condition sooner than many other nursing staff caring for the same resident (Nursing Assistant Guide, 2009). It is therefore critical to educate nursing assistants on the importance of oral health, how to identify abnormal changes of the oral status, and also provide them with tools that can guide them in their skills as they deliver care to residents.

Gap in Literature

There is abundant literature indicating that oral health is important for general health and overall well-being, however little attention is given to the oral care aspect of life for nursing home residents. Literature also indicates that there are valid and reliable tools that can be used in long term care facilities to assist in assessment of oral health, but very little is known about the implementation of the tool in a real nursing home culture, and nurses and nurse practitioner's perceptions of the tools. Furthermore, no literature was found indicating the outcome of implementing the OHAT as a screening tool in nursing home residents. Specifically, the outcome that compares the number of documentation entries and the number of residents referred/treated for oral health issues before and after implementation of the OHAT tool was not shown in literature.

Conceptual Framework

The self-care deficit nursing theory

The Self- Care Deficit Nursing Theory (SCDNT) was developed and first published in 1971 by Dorothea Orem. The SCDNT is part of the three theories that composed the Orem's general theory of nursing. The three nested theories are theory of self-care, theory of self-care deficit and theory of nursing systems. The theory of nursing systems is the encompassing theory that contains the theory of self-care deficit (McEwen & Wills, 2006). The theory of self-care deficit contains the theory of self-care (See Figure 1)

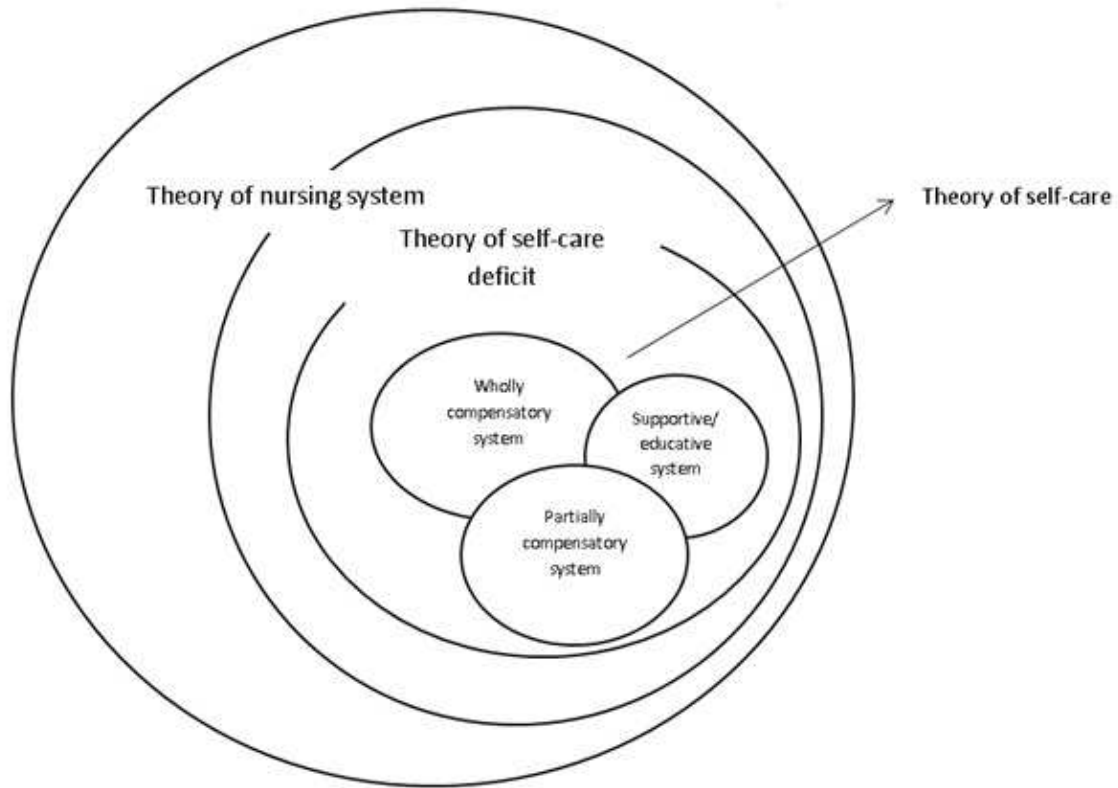


Figure 1: The self-care deficit nursing theory. Reproduced from mcewen & Wills, 2006.

The core of Orem's theory is the belief that humans engage in continuous communications and interchange among themselves and their environment to remain alive and to function. The main selected concepts in SCDNT for the purpose of this study are explained below:

- *Self-care*: A human regulatory function that is a deliberate action to supply or ensure the supply of necessary materials needed for continued life, growth, and development and maintenance of human integrity.
- *Self-care agency*: Acquired ability to perform self-care; self-care agency is affected by basic conditioning factors such as age, gender, health care system, and family system.
- *Therapeutic self-care demand*: Nurse's assistance in meeting the self-care needs.

- *Self-care requisites*: Actions directed towards the provision of self-care. There are three categories of self-care requisites: universal, developmental and health deviation self-care requisites.
- *Nursing systems*: The nursing systems are activated when the client's therapeutic self-care demand exceeds available self-care agency, leading to the need for nursing. The nursing systems can be wholly compensatory, partially compensatory or supportive or educative.

In Orem's theory, self-care deficit arises when there is inadequacy in any of the self-care requisites. The deficits may be temporary or permanent and nursing actions can either eliminate or decrease the severity of the deficit. The deficit is identified by the nurse through assessment of patients. Once the deficit is established by the nurse through assessment, the nurse selects a nursing system that best serves the need of the patients. The figure is presentation of three theories nested into one theory.

Application of Orem's theory to current study

Nursing home residents receive different levels of care. Residents can either be partially dependent, totally dependent, or independent with their activities of daily living. In the case of partial and total dependence, the residents in nursing homes depict self-care deficit due to developmental/aging factors such as decrease in vision, altered cognition, and musculoskeletal limitations. The residents' self-care deficit impacts their overall health including the ability to maintain a healthy mouth. Therefore, using the Oral Health Assessment Tool, the nurse will determine the severity of the deficit and select an appropriate nursing intervention (referral to dentist, physician, medication adjustments or update of oral hygiene care plan) that best suits the degree of the resident's need.

CHAPTER III. PROJECT DESIGN

Planning the Project

This practice improvement project was divided into four phases. The phases include: a) Doctor of Nursing Practice (DNP) student provided education to nursing staff and family about the importance of oral health; b) DNP student introduced Oral Health Assessment Tool (OHAT) tool to nursing staff and the nurse practitioner; c) DNP student implemented OHAT in nursing home culture; and d) DNP student evaluated the effects of an oral health assessment tool on the nursing staff's patient care practices at Bungoma nursing home. Both qualitative and quantitative data were collected and assessed over a two month period.

Description of the nursing home

This practice improvement project was carried out at the Bungoma nursing home in North Dakota. The name of the facility has been changed for the purpose of this project. The Bungoma nursing home is a 111 bed facility that has been providing skilled nursing care and rehabilitation services for over 60 years. The Bungoma nursing home is sponsored by the Sisters of Mary of Presentation, which is a small Catholic health system. The Bungoma nursing home has a policy that all residents should receive oral care twice daily. However, for patients who are unconscious, receiving oxygen, unable to take fluids by mouth or feverish, oral cares are performed every two hours or according to an individual plan (Facility Policy and Procedure, 2011). In addition, the Bungoma nursing home has a contract with Apple Tree Dental to provide annual oral screening for all residents that do not have annual dental screens at their own dental provider (Facility Policy and Procedure, 2011). Therefore, at this facility some residents only have the opportunity to be seen by the dental professional once a year. It is therefore paramount

that resident assistants and nurses who are in contact with the residents on a daily basis have the skills and tools to guide them on basic oral assessments, thus, the goal for the current project.

Participants

The participants in this project were the nurse practitioner, nursing staff, residents, and family members. The project was carried out on a single unit of the facility as suggested by Director of Nursing (DON). Additionally, chart reviews were conducted on the residents of the 16 bed unit. For the purpose of this project this unit was labeled Unit X. The unit manager of the nursing home assisted in relaying information to nursing staff and also identifying reliable staff that assisted in coordinating this project. A convenient sample of 16 charts was targeted to be reviewed prior to implementation of the tool and after implementation of the tool. However, only 10 charts were consented to be used. The charts selected met the criteria of the residents having been living in the nursing home for at least three months at the time of the study. The nursing mix was limited to the staff that directly provides care to the residents that included nurses and nursing assistant.

The residents on Unit X were divided up into four groups. Each group was assessed once a month and on an as-needed basis by the nursing assistant on duty using OHAT. A team of nurses and resident assistants was selected to oversee the actual implementation of the project each week. The role of the team leaders was to assign and remind other resident assistants to assess resident oral status using OHAT. A \$25.00 gift card to Wal-Mart was offered to the nursing staff to encourage participations.

OHAT Tool

The Oral Health Assessment Tool was developed by Dr. Chalmers by modifying the BOHSE tool in 2004 (See Appendix A). Along with the OHAT tool Oral Hygiene Care Plan (OHCP) was developed as an intervention that nursing staff could follow when a resident did not require a referral to a dentist or other medical professional. The OHAT tool has been adopted in oral health assessment guidelines by several agencies such as the IOWA geriatric education centers and Regional Geriatric Program central (RGPC) in Ontario. The tool has eight categories that need to be assessed by nursing staff (See Appendix B). The eight categories include lips, tongue, gums and tissues, saliva, natural teeth (yes/no), dentures (yes/no), oral cleanliness, and dental pain. Each category is given a score of 0=healthy, 1=oral changes, and 2=unhealthy. The maximum score obtainable is 16 and the lowest score is 0. In addition, the tool provides nursing staff with sections to document what actions were taken when patients were assessed. The nursing staff options include whether the resident was referred to a dentist, nurse practitioner, or physician depending on the problems identified or whether the nurses implemented nursing interventions to maintain oral health of the mouth by adjusting the OHCP. The tool also requires the resident to be referred to a health care professional or an action be taken when a resident scores more than one on any of the eight categories. Additionally, nurses are required to chart if the residents or families refuse the care or treatment.

Necessary Resources

The OHAT tool was modified by the Halton's Regional Health Department with permission from Chalmers to suit their needs. The Halton's Regional Health Department delivers public health services to the Halton's region which is composed of four cities in Canada. The DNP student obtained permission from Donna Bowes; supervisor for Oral Health at the

Halton's Regional Health Department to use the Halton's oral health teaching materials. Information obtained from Halton's regional center along with research articles was used to create an educational intervention PowerPoint for nursing staff at Bungoma nursing home.

The OHAT tool was also reformatted to be 'user friendly' for Bungoma nursing home (see appendix G). The North Dakota State University statistics department was accessed for analysis of data.

Plan to Implement the Project

Phase one

In the initial phase of the project, all nursing staff members were invited to participate. Education about the importance of oral health was provided to nursing staff during their monthly meeting at the nursing home. Materials utilized during the presentation were a 20-minute PowerPoint and a handout developed by the DNP student. The content of the educational intervention included information such as the importance of oral health in the elderly population, consequences of poor oral health, and how to use OHAT. A pre-test survey was administered prior to the onset of the presentation. The survey collected information about the nursing staff's knowledge about oral health and their assessment skills (see appendix B). At the end of the presentation the participants completed a post-test survey. The post-test survey collected information about participant's knowledge about oral health and their assessment skills as well as the content of the presentation (see appendix C). The participants were given a random number that they wrote on both the pre and post questionnaire so that comparison could be drawn during the analysis.

A brochure written by this DNP student, using first person language about the importance of oral health, was either mailed or hand delivered to families. The families' contact information

was accessed in the facility's records with permission from the nursing manager at Bungoma nursing home. Families were asked to complete a one question survey after reading the brochure and also to provide additional comments. The question was 'how likely are you to seek dental treatment/services for your family member living in the nursing home?' The purpose of the survey question was to gauge the effectiveness of the information provided in the brochure (See Appendix G).

Phase two

The second phase of this project involved the actual implementation of the OHAT in resident assessments and also an evaluation of the nursing staff's perception about the use of the OHAT in a resident's assessment. The implementation period was three months. Within these three month period, the nursing staff used the OHAT monthly and on an as needed basis in assessing the residents' oral health. The residents who had consented to participate in the project were divided into weekly assignments so that the participants have an organized way of utilizing OHAT on residents.

Phase three

Chart auditing was done during phase three. Baseline data about the frequency of documentation, assessment, treatment and referral of oral problems was obtained from the residents' clinical records. A chart review tool developed by the DNP student was used to assist in chart auditing. Data collected was obtained from medical records three months prior to implementation of the OHAT. At three months post implementation of the current project, data was obtained both from the medical records and from the information written on the OHAT by staff. The charts were labeled in numerical order to avoid use of names during data collection. A

positive outcome would have occurred if a resident's chart indicated more than a 50% increase in the number of documentations done related to oral health.

Phase four

In the final phase, a post- survey about the nursing staff's perceptions of the OHAT tool was administered (see appendix D). The post survey asked participants who used OHAT to respond to the following questions using a five-point Likert Scale (1=strongly disagree, 5=strongly agree). Questions were: 1) the oral health assessment tool can help me recall what to look for when providing oral care, 2) the oral health assessment tool can help me recall categories of the mouth that need to be assessed therefore improving my assessment skills, 3) the oral health assessment tool has made me prioritize oral care as part of my daily patient care practices, 4) I would like to continue using the electronic oral assessment tool, and 5) the oral assessment tool is a quick and easy tool to use daily. Basic demographics such as age and title were collected. Level of education and years of experience in long term care facilities were also collected. Demographic information was also obtained from the participants.

During this phase, a nurse practitioner working at Bungoma nursing home was invited to participate. The nurse practitioner was provided with the OHAT to review. She was then asked to complete a survey (see appendix E). Demographic information was obtained. Apart from demographic information, other The items on the survey were: 1) the OHAT can act as a reminder to assess oral health when doing my nursing home rounds, 2) the OHAT tool is quick and easy tool to use during nursing home rounds, 3) I would use OHAT during my rounds in the nursing home, 4) the OHAT can help me recall categories of the mouth that need to be assessed therefore improving my assessment skills, and 5) I could prescribe OHAT to be used as an

assessment tool in the nursing home. A five point Likert Scale was used to measure the responses (1= strongly disagree, 5= strongly agree).

Data Analysis

A consultant at Statistic Department at North Dakota State assisted with analysis of data. Statistical Analysis System (SAS 9.2) was the program used to analyze some of the data. A paired t-test was computed to determine the difference between pre-test responses and post-test responses during phase one of the project. Simple statistical tests (mean and mode) and frequencies were used to analyze the rest of the data. Data was numerically and graphically presented.

Institutional Review Board

The proposal of this study was presented to the Institutional Review Board (IRB) at North Dakota State University for approval, a letter of support and a memorandum of understanding (MOU) from Bungoma nursing home was obtained. All participants were informed about any possible harm. The families, nurse practitioner, and nursing staff at the nursing home were provided with a consent form but a signature was not required. The residents at the nursing home were approached for consent if they were capable. For the residents that were not capable of providing consent, their legal representatives/families were contacted for consent.

CHAPTER IV. RESULTS

This chapter will outline the statistical analysis of data obtained to reveal the findings of this practice improvement project. The DNP student initially entered the data into the Microsoft Excel spreadsheet and then sent the data to the Statistics Department at North Dakota State University for computation. The results of the study are outlined in light of the questions posed at the beginning of the study. Descriptive statistics were used to analyze demographic data and scores of the surveys. A paired t-test was computed to determine the difference between pre-test responses and post-test responses during phase one of the project.

Evaluating the Impact of the Education Intervention

The purpose of the first research question (RQ1) was to evaluate the impact of the education intervention on nursing staff knowledge of oral health. RQ1 was *'how does the education intervention on the "Importance of Oral Health" increase nursing staff's knowledge of oral health in the elderly?'* To answer this question the participants were invited to view a 20-minute PowerPoint presentation by the DNP student on 'Importance of Oral Health' which consisted of a total of twenty-two slides (See Appendix I). Participants were also asked to respond to pre-test and post-test surveys. All nurses and resident assistants working at Bungoma nursing home were invited to participate, including the nurses and resident assistants working on unit X. For this project, the presentation was presented to all Bungoma nursing staff that were present that day, but only the nursing staff on unit X used the OHAT to assess residents' mouths at Bungoma nursing home.

The first thirteen slides focused on education about oral health. The second section of the PowerPoint presentation included nine slides outlining the use of OHAT. The consequences of poor oral health, such as oral-facial pain, poor diet, social isolation, and poor communication

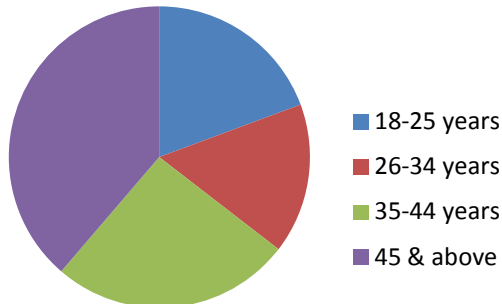
were presented. The relationship of poor oral health and aspiration pneumonia, uncontrolled diabetes, and heart disease were also presented. The pre-test and post-test surveys were titled “*Pre and Post-oral Health Education Intervention Questionnaire.*” The pre-oral health education intervention questionnaire was a 9-item survey. The post-oral health education intervention questionnaire was an 11-item survey. A total N=31 participated in this section of the study, ranging in age from 18 years to 45+ years.

Pre-test survey

Consistent with most nursing home staffing, the majority of participants were Licensed Practical Nurses (LPN) (n=18, 58.06%). The greatest percentage of age ranges fell in the 45+ range (n=12, 38.71%); 25.81 percent were 35-44 years old; 16.13 % were 26 to 34 years old; and 19.35 percent were 18 to 25 years old.

More than half of the participants (n=24, 77.42%) had a college degree; 3.23 % (n=1) had a graduate degree; 6.45 % (n=2) had completed high school; and 12.90 % (n=4) indicated that they had taken some college classes. The majority of the participants (70.97%) had more than six years of experience in long term care; 6.45 % had less than one year of experience in long term care; 9.68% had 1 to 3 years of experience in long term care; and 12.90% had 4-6 years of experience in long term care. Figure 2 illustrates the sample demographics of the participants.

Age Ranges of Nursing Staff



Roles/Titles of Nursing Staff

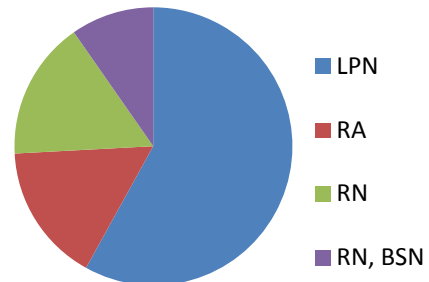


Figure 2: Sample demographics in pre-test.

Apart from demographic questions, the pre-test survey asked the participants to indicate the amount of education received about oral health prior to the current study. Using a five-point Likert Scale (1= lowest to no education, 5 = a lot /sufficient education) about oral health of the elderly living in the nursing home. On this question, only 6.45% of the participants scored 5 indicating that they had sufficient amount of education about oral health. The mean response was 3.09 ($SD = 0.98$). One respondent (3.23%) indicated that they have had lowest/no education received about oral health.

The pre-test survey examined the importance of oral care in the routine care of residents at the nursing home. Responses were measured using a five-point Likert Scale with scores ranging from 1 (not important) to 5 (very important). In this section, 74.1 % of the participants indicated that oral health is very important to routine care of residents at the nursing home; 25.81 % indicated that oral health is important to routine care of residents; and none of the participants indicated that oral care was not important, somewhat important, nor unsure.

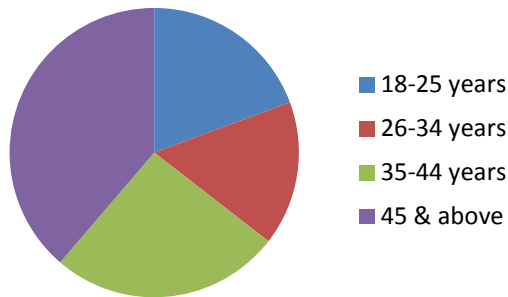
In addition, the pre-test survey examined the knowledge of participants about the relationship between poor oral health and pneumonia, diabetes, and heart disease. Participants

were asked to indicate on five-point Likert Scales ranging from strongly agree to strongly disagree that poor oral health can affect diabetes control, play a role in development of heart disease, and also affect the lungs. This aspect is demonstrated in questions 7, 8, and 9 of the survey, respectively. Of the respondents, 61.29 %, 54.84 %, and 51.61 % strongly agreed that poor oral health can affect the heart, lungs, and diabetes control, respectively. Of the respondents, 35.48 %, 41.94 %, and 45.16 % indicated they agree that poor oral health can affect the heart, lungs, and diabetes control, respectively. One of the participants (3.23%) was undecided on whether poor oral health can affect the heart, lungs, and diabetes control.

Post –test survey

The post-test survey contained the same questions as the pre-test survey with additional opportunity for participants to write further comments on how the education intervention had affected their own oral health. The following figure indicates the sample demographics of the participants in the post-test survey. Similar age ranges were noted in the pre-test survey as the post-tests survey. One participant indicated that she was an RN, BSN in pre-test, but indicated that she was just RN in post-test survey. It is difficult to ascertain why the discrepancy occurred. Figure 3 indicates the sample demographics in post-test responses.

Age Ranges of Nursing Staff



Roles/Titles of Nursing Staff

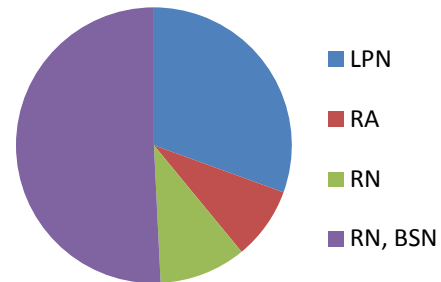


Figure 3: Sample demographics in post-test.

First, the respondents were asked to use a five-point Likert Scale (1=lowest to no education received, 5= a lot/sufficient amount of education received) about oral health in the elderly living in the nursing home. On this question, 35.48% of the participants indicated they had sufficient amount of education about oral health. The mean response was 4.0 (SD=0.97). In addition, the respondents were asked again to indicate how important oral care is during routine care of the resident living in the nursing home. On this question, 93.55 % of participants indicated that oral care is very important and 6.45% indicated oral health is an important part of the routine care for the residents in the nursing home.

Second, the post-test survey again examined whether the participants agree or disagree that there is a relationship between the effect of poor oral health on diabetes control, development of heart disease, and lung problems. In this section, 80.65 %, 80.65 %, and 80.65 % strongly agreed that poor oral health can affect the heart, lungs and diabetes control, respectively. In addition, 16.13 % of the respondents indicated that they agree that poor oral health can affect the heart, lungs and blood sugar control in diabetic patients.

Finally, the participants on the post-test were asked to write down how the education intervention had affected their own health. All the comments had the same theme of improved education and awareness. Due to repetition of comments by participants, the DNP student randomly selected ten comments made by the participants. These comments are highlighted in Table 1.

Table 1: *Free Text Comments in Post-Test Survey.*

Participant	Comment.
Participant 1	“Information given to me will be easy to pass onto others”
Participant 2	“Had not heard of relation with pneumonia before”
Participant 3	“I will question more why my residents won’t eat or open mouth”
Participant 4	“I feel I need to improve my oral health. Prevention is best”
Participant 5	“Brought up things I usually don’t think of.”
Participant 6	“I particularly learned about the relationship between oral health and DM”
Participant 7	“I feel strongly about this topic, am glad to have this brought to the forefront of our attention.”
Participant 8	“Helped me broaden my mind on why problems may have arisen”
Participant 9	“Brush and observe more. Good for myself and family”
Participant 10.	“Made me more aware of the effects oral health has on my health as a whole.”

Apart from frequency statistics, comparison tables were completed to evaluate knowledge change during the pre and post oral health education intervention (N=31).

Table 2: Comparison Table on Pre-Test Versus Post-Test on Selected Items.

Question	Pre-test %	Post-test %
On the scale of 1-5 please rate the amount of education you have received about oral health. 1= no to very little education 5=A lot/sufficient education	5=6.45%	5=35.45%
How important is oral health to the care you provide to your residents?	Strongly agree =74.19%	Strongly agree = 93.55%
Poor oral health can affect my residents' heart.	Strongly agree =61.29%	Strongly agree =80.65%
Poor oral health can affect my residents' lungs.	Strongly agree =54.84%	Strongly agree =80.65%
Poor oral health can alter blood sugars for my diabetic residents.	Strongly agree =51.61%	Strongly agree =80.65%

Furthermore, a paired sample *t-test* was conducted to compare the pre-test and post-test responses for the question that assessed the amount of education received by participants. The *t-test* tested the difference in the amount of education and whether there was change in knowledge between the pre-test and the post-test. The paired *t-test* showed that there was a significant difference in the amount of education received prior to the education intervention and post education intervention with an average mean difference of -0.90, paired $t(30) = -5.24$, $p < 0.0001$. These results indicate that participants had an increased amount of education after the oral health education intervention.

A paired sample *t*-test was also conducted to compare the pre-test and post-test responses on the statements ‘poor oral health can affect my residents’ heart’, ‘poor oral health can affect my residents’ lungs’, and ‘poor oral health can alter blood sugars for my diabetic residents’. One of the participant’s responses were dropped due to going from strongly agree on pre-survey to strongly disagree on post survey, hence N=30. The participant was dropped to retain the accuracy of the data. First, there was a significant difference in the scores for ‘poor oral health can affect my residents’ heart’ in pre-test survey and post survey with average mean difference being 0.26; $t(29) = 2.50, p = 0.018$. Second, there was a significant difference in the scores for ‘poor oral health can affect my resident’ lungs’ in pre-test survey and post-test survey with average mean difference 0.33; $t(29) = 3.34, p = 0.002$. Lastly, there was a significant difference in the scores for ‘poor oral health can alter blood sugars for my diabetic residents’ in pre-test survey and post-test survey with average mean difference 0.36; $t(29) = 3.61, p = 0.001$.

Evaluating the Impact of OHAT on Patient Treatment and Referral

Research question two (RQ2) was used to evaluate the utilization impact of the OHAT. Research question two was ‘*what impact does the use of OHAT have on resident assessment, documentation, and referral?*’ To answer this question, the DNP student reviewed 10 charts after consent was given from family members, ($N=10$). The residents’ charts were reviewed three months prior to implementation of the projects. At the end of the project implementation, seven charts were available for audit since one resident had been discharged, one switched units in the middle of the project, and one another resident passed away, hence $N=7$. The information collected from the patients’ medical records were patient diagnosis, documentation of oral health status/problems, any referral made to a provider due to oral health issues, pneumonia infection

during the implementation of the project, and whether residents were assisted or independent with their oral care.

Pre-test chart audit

In the pre-test chart audit, ten charts were reviewed; 80% of the residents whose charts were reviewed were assisted with their daily oral care and 20% of the residents whose charts were reviewed were independent with their daily oral care. No pneumonia diagnosis was identified in any of the ten charts within the three months prior to the implementation of the project. There were no entries about oral health problems charted and therefore no resident was referred to the provider within the three months prior to the onset of the project.

Post-test chart audit

Seven charts were available for audit at the end of the project implementation. Two of the seven residents were independent with their daily oral care. Three of the seven charts had documentation/entries related to oral health. The documentations contained two entries on lower lip lesions that were referred to a provider for treatment, three entries on tooth decay that were referred to a dentist but the family declined to follow up with dentist referral, and last there was one entry about need to provide a special toothpaste for one of the residents.

Nurse Practitioner and Nursing Staff Views on OHAT

The third research question (RQ3) was posed to evaluate the nurse practitioner and nursing staff view of the OHAT. Research question three was '*what are nurse practitioner and nursing staff's views on OHAT in assessing a resident's oral health status?*' To answer this research question, a nurse practitioner, nurses, and resident assistants were invited to participate in the study. There is only one nurse practitioner who visits Bungoma nursing home on a weekly

basis. The nurse practitioner was asked to complete a survey about her perceptions of OHAT after she was given the tool to review.

The nurse practitioner was to respond to the following statements through a survey; ‘the Oral Health Assessment Tool can act as a reminder to assess oral health when doing my nursing home rounds’, ‘the Oral Health Assessment Tool is a quick and easy tool to use during nursing home rounds’, ‘I would use the Oral Health Assessment Tool during my rounds in the nursing home’, ‘the Oral Health Assessment Tool can help me recall categories of the mouth that need to be assessed, therefore improving my assessment skills’, and ‘I could prescribe the Oral Health Assessment Tool to be used as an assessment tool in the nursing home’. A five-point Likert Scale was used to measure the responses (1=strongly agree, 5= strongly disagree) (See Appendix E). First, the nurse practitioner indicated that she was undecided on whether OHAT is quick and easy to use. Second, the nurse practitioner indicated that she would “agree” to prescribe OHAT to be used by nursing staff as an assessment tool. Finally, the nurse practitioner indicated that she would “agree” that OHAT can improve her assessment skills and also act as a reminder to assess oral health of the residents during nursing home rounds.

After the implementation of the project, the nurses and resident assistants who used the OHAT during the study were asked to complete a survey assessing their perceptions of OHAT. The nursing staff working on Unit X and participated in the OHAT education were invited to use the OHAT. Five respondents completed the survey assessing their perceptions about OHAT. A five-point Likert Scale was used to measure their responses (1= strongly agree, 5=strongly disagree) (see appendix D). The questions on the survey assessed whether nursing staff view a) OHAT as a quick and easy tool to use, b) whether OHAT can remind staff on what to assess in the oral cavity, c) whether OHAT helps staff prioritize oral health in residents care, and d)

whether staff will continue using OHAT and what frequency would they prefer using OHAT.

The survey also collected demographic information from the participants.

All participants indicated that they either strongly agree or agree with the statements a, b, and c. Twenty percent of the participants indicated that they were undecided on whether to continue using OHAT, while 80% of the participants agreed that they will continue using OHAT. Of the 80% of the participants who agreed to continue using OHAT, 60%, 20%, and 20% indicated that they would prefer to use OHAT on a monthly basis, weekly basis, and daily basis, respectively. The percentage responses are in the Table 3.

Table 3: *Nursing Staff Perceptions of OHAT.*

Question	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Oral health assessment tool can help me recall what to look for when providing oral care.	80%	20%	0%	0%	0%
Oral health assessment tool can help me recall categories of the mouth that need to be assessed therefore improving my assessment skills.	80%	20%	0%	0%	0%
Oral health assessment tool has made me prioritize oral care as part of my daily patient care practices.	80%	20%	0%	0%	0%
Oral health assessment tool is quick and easy tool to use daily.	100%	0%	0%	0%	0%
I would like to continue using the oral assessment tool.	40%	40%	20%	0%	0%
I prefer to use oral assessment tool.	Daily	Every other day	Weekly	Monthly basis	
	20%	0%	20%	60%	

Influence of Brochure on Families

Research question four evaluated the impact of the educational brochure on families' willingness to seek dental services for their loved ones. The question was *'how does the brochure "My Mouth is Part and Parcel of My Health" impact the families' willingness to seek dental services for their loved ones living in the nursing home?'*

To answer this research question, a brochure and a two- question survey were mailed to all family members whose loved ones were residents at Bungoma nursing home on unit X. A

total of 10 brochures and 10 surveys were mailed out or hand delivered to family members. The participants were asked to read the brochure then respond to a two question survey. The brochure contained information about the relationship between poor oral health and diabetes, heart disease, pneumonia, and general well-being. In addition, the brochure outlined what one can do to improve oral health of family members living in a nursing home (see Appendix H).

The survey asked the participants to indicate their likelihood of seeking dental care for their loved ones after reading the brochure. The options given to the participants were not likely, somewhat likely, very likely, extremely likely, and don't know. In addition, the survey asked the participants to write any additional comment on whether the content of the brochure had any influence on their own health. Out the 10 surveys, 6 participants responded, which was a 60% response rate. One hundred percent of the respondents indicated they were either very likely or extremely likely to seek dental care for their loved ones living in the nursing home. The percentage responses to the survey question are in the Table 4.

Table 4: *Family Members.*

	Not likely	Somewhat likely	Very likely	Extremely likely	Don't know
How likely are you to seek dental treatment/services for your family member living in the nursing home	0%	0%	50%	50%	0%

Table 5 outlines the three written comments about how the brochure influenced the family members' knowledge about oral health.

Table 5: *Free Text Comments about the Brochure's Influence.*

Comment	
Participant 1	“Informative, It informed me about the pneumonia bacteria, and how if dad's oral health isn't good, and then maybe his dentures won't fit well.”
Participant 2	“I was surprised to learn that oral issues can contribute to pneumonia”
Participant 3	“I did not know pneumonia and bad mouth are related.”

CHAPTER V. DISCUSSION AND RECOMMENDATIONS

Interpretation of Results

The purpose of this project was to introduce and pilot a regular system of oral health assessment into the care of nursing home residents. To achieve the goal, the project was outlined in four phases and four study questions. The participants for the study included a nurse practitioner, nursing staff, family members of the residents, and residents. The study was carried out on a sixteen-bed unit in the nursing home.

This chapter is summation of the Practice Improvement Project (PIP) and presents and discusses the conclusion reached from the analysis of data as they relate to the study questions. The implications for practice, limitation, and recommendations for the site and future PIP projects are offered.

Health care providers must understand the impact and risks of poor oral health to systemic disease on elderly residents in nursing homes in order to better care for these population groups (Kebschull et al., 2011; Matthews et al., 2011; Cunha, 2011; El-Solh, 2011). The questions set in the study were answered. The results to question 1 ('how does the education intervention "Importance of Oral Health" increase nursing staff's knowledge of oral health in the elderly?') illustrated that there was improvement in the awareness and knowledge about the significance of poor oral health to the general wellbeing of residents living in the nursing home. This conclusion is affirmed by several indicators. First, pretest means (M) increased from 3.09 to 4.0 in post-test on the survey question that inquired about the amount of knowledge received. Second, the hand written comments indicated that staff and family members had received some sort of new information about oral health as indicated in Tables 4 and 6.

Third, the response percentage on the question ‘how important is oral health to the care you provide to your residents?’ increased from 74.19% (very important) on the pre-test survey to 93.55% (very important) on the post-test survey. These results indicate that the project successfully increased knowledge among staff and families. Finally, there was a statically significant difference in the pre- and post-test responses on the knowledge about the relationship between poor oral health and its effect on lung infections ($p=0.002$), heart disease ($p=0.018$), and diabetes control ($p=0.001$) as illustrated in Table 5. The results of this survey are consistent with the finding by Le, Dempster, Limeback, and Locker (2012) which indicated that the post-test oral health knowledge improved among the staff members who received education about oral care. The conclusion of this PIP also supports the literature that education is a feasible way of improving nursing staff motivation for daily oral hygiene care (Forsell, Kullberg, Hoogstraate, Johansson, & Sjogren, 2011).

To answer question 2 (‘what impact does the use of OHAT have on resident assessment and referral for further evaluation?’), data was collected from the medical records of the residents three months prior to implementation of the study and the implementation of the PIP using the chart review tool in appendix B. There was an increase in the number of entries/documentation in residents’ charts after the implementation of the project. There were a total of three entries noted in charts after implementation of the project compared to no entries three months prior to the implications of the project. This indicates that as a result of this project, the nursing staff was paying more attention of the oral health conditions of the residents.

The data analysis of the responses to question three (‘what are nursing staff and nurse practitioners’ views on OHAT in assessing a resident’s oral health status?’) highlighted that the OHAT could be an important tool that nurse practitioners working in nursing homes can

prescribe and thus improve the oral health condition of older adults living in the nursing home/Restate this to read better. This point is not only illustrated by the nurse practitioner indication on the survey that she would prescribe the OHAT for use in nursing homes, but also by 80% of the nursing staff indicating that they are willing to continue using the OHAT tool in the care of residents living in the nursing home. Furthermore, 100% of the staff indicated that the OHAT is a quick and easy tool to use which is consistent with Chalmers et al (2005). To my knowledge, this study is the only study that has evaluated the willingness of a nurse practitioner to prescribe the OHAT to be used in the nursing home. The willingness of the nurse practitioner to prescribe the OHAT to be used in the nursing home is a step towards introducing evidence based guidelines into the nursing home, which was deemed by the MacEntee et al (2011) study as lacking. It is imperative to point out that the chances of adherence to the use of OHAT by nursing homes are increased if both the prescriber and the user are knowledgeable and ready to use OHAT.

In response to question four (*'how does the brochure, "My Mouth is Part and Parcel of My Health" impact the families' willingness to seek dental services for their loved ones living in the nursing home?'*), all of the family members indicated that they are very likely to refer their family members for dental services if needed. This response is contrary to what the chart reviews revealed in that one resident with dental decay was referred to a dentist but family declined to follow up with the referral. However, tracing back on this particular family member to ascertain whether she/he was among the families that responded to the brochure would be deficient. Although the families were asked to read the brochure before responding to the survey question, it was difficult to control this because the brochure and the survey question were mailed in the same envelope to increase the chances of responding.

Implications for Practice

It is crucial that healthcare providers, families, and caregivers feel confident and knowledgeable about oral care and its impact on general well-being. Caregivers can then use this knowledge to provide high quality care to the elderly living in the nursing home. The current PIP calls for nurse practitioners working in nursing homes to increase their knowledge and attention towards oral health and to advocate against the adverse outcomes related to poor oral health and systemic disease. Nurse practitioners working in nursing homes can facilitate the effective use of evidenced-based resources and decrease hospital admissions in long-term care facilities for many chronic diseases (MaAciney, 2008). The current practice improvement project proved that the nursing home staff is ready and willing to use the OHAT after adequate education is provided. Therefore, advanced nurse practitioners working in nursing homes should take advantage of this and facilitate the use of resources such as OHAT in nursing homes.

The case-fatality rate of older adults admitted to the hospital for pneumonia ranges from 13% to 41% (Raghavendran, Mylotte, & Scanappieco, 2007). Oral hygiene and swallowing difficulty are two modifiable risk factors described in literature for pneumonia infections for elderly residents in nursing homes (Quagliarello et al, 2009). Other risk factors identified that increase mortality from pneumonia infection are dementia and use of sedatives (Raghavendran et al, 2007), which affect a reasonable number of residents in nursing homes. All advanced practice nurses should consider oral health as part of their role. Nurse practitioners need to promote the use of evidence-based resources in nursing homes as indicated by this practice improvement project. The willingness of the nurse practitioner to prescribe OHAT at the facility where this project was carried out is a step in the right direction.

Limitations

There were several limitations to this practice improvement project, which could impact the generalization of the findings to other nursing home facilities. The practice improvement project was limited to one unit in a 111-bed facility. This unit is staffed by one nurse each shift and four resident assistants. Although the education intervention was provided to a total of 31 participants, only five participants used the Oral Health Assessment Tool (OHAT) in the care of the nursing home residents. In addition, there was only one nurse practitioner that participated in this study since she is the only nurse practitioner that provides care to Bungoma Nursing home residents on site on a weekly basis.

The surveys used to collect information from staff were developed by DNP student and reviewed by the dissertation committee members, but there was no reliability testing done. Most questions were straightforward and subjective. The survey used to assess the family member's likelihood of referring their resident was a one question survey and mailed to the families in the same envelope as the educational pamphlet. Therefore, it is difficult to ascertain whether the questions were answered after reading the pamphlet or vice versa.

Another limitation is the time frame allowed for the use of the OHAT. The participants were allowed three months to use the OHAT, after which time their views were evaluated. Some of the staff members may not have had the opportunity to use the OHAT tool in this time frame. Furthermore, a three month period is a short time to evaluate the impact of implementing this regular oral assessment tool on pneumonia infection rates. The sustainability of this project at Bungoma nursing home is questionable since the Director of Nursing, who was a key facilitator in implementing this project at Bungoma nursing home, recently resigned.

Indications for Future Oral Health Practice Improvement Projects

Evidence that poor oral health contributes to the development of other systemic diseases is building (Adachi et al, 2007; Pace & McCullough, 2010). A similar, but longer practice improvement project with a larger population, can further promote the need to recognize the impact of poor oral health.

Future practice improvement projects should involve more than one nurse practitioner in the study and evaluate the practitioners' perceived barriers to improved oral health in the nursing home. The involvement of more than one nurse practitioner will increase the generalizability of the study outcomes.

Projects evaluating federal policies that impact the access of dental care, and healthcare in general, for residents living in nursing homes are recommended. In addition, conducting a project to educate nurse practitioners on the management of common oral health issues could increase the confidence of nurse practitioners dealing with dental problems. Finally, projects to introduce oral health education in doctor of nursing programs will further increase the awareness and impact of oral health to overall well-being. Danielson, Dillenberg, & Bay (2006) evaluated oral health competencies among Physician assistants (PA) and nurse practitioners and found that fewer than half of the PAs and NPs who participated felt competent to assess and manage oral health problems.

Conclusion

Older adults living in nursing homes are a vulnerable population. Improving oral health in this population is just one way to improve their general well-being. Essentially, these nursing home residents are dependent on nursing staff for their activities of daily living, which must include oral health. Educating and improving awareness about the importance of oral health for

the nursing staff that care for this population is a huge step towards health promotion and disease prevention.

Bungoma nursing home has a system where dental hygienists visit the nursing home on a monthly basis. The DNP student recommends that the OHAT be used to triage residents that need to be seen by Apple Tree dental. Older adults need a voice to stand for them regarding oral health during their stay at the nursing home facility. The nurse practitioners working in the nursing homes should be that voice. The nursing home staff should echo what the leader (nurse practitioner) teaches. Through a sustainable practice improvement project, nurse practitioners can teach not only the nursing staff, but also the families about the importance of oral health, which might improve the care of residents.

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APPENDIX A. ORAL HEALTH ASSESSMENT TOOL

ORAL HEALTH ASSESSMENT TOOL (OHAT) FOR LONG-TERM CARE Nursing Admission Quarterly 1 2 3

Resident:	Completed by:	Date:
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*NOTE: A Star * and underline indicates referral to an oral health professional (i.e. dentist, dental hygienist, denturist) is required.*

Category	0 = healthy	1 = changes	2 = unhealthy	Score	Action Required	Action Completed
Lips	Smooth, pink, moist	Dry, chapped, or red at corners	Swelling or lump, white/red/ulcerated patch; bleeding/ ulcerated at corners*		1=intervention 2=refer	<input type="checkbox"/> YES <input type="checkbox"/> NO
Tongue	Normal, moist, pink	Patchy, fissured, red, coated	<u>Patch that is red and/or white, ulcerated, swollen*</u>		1=intervention 2=refer	<input type="checkbox"/> YES <input type="checkbox"/> NO
Gums and Tissues	Pink, moist, Smooth, no bleeding	<u>Dry, shiny, rough, red, swollen around 1 to 6 teeth, one ulcer or sore spot under denture*</u>	<u>Swollen, bleeding around 7 teeth or more, loose teeth, ulcers and/or white patches, generalized redness and/or tenderness*</u>		1 or 2 = refer	<input type="checkbox"/> YES <input type="checkbox"/> NO
Saliva	Moist tissues, watery and free flowing saliva	Dry, sticky tissues, little saliva present, resident thinks they have dry mouth	<u>Tissues parched and red, very little or no saliva present; saliva is thick, ropey, resident complains of dry mouth*</u>		1=intervention 2=refer	<input type="checkbox"/> YES <input type="checkbox"/> NO
Natural Teeth <input type="checkbox"/> Y <input type="checkbox"/> N	No decayed or broken teeth/ roots	<u>1 to 3 decayed or broken teeth/roots*</u>	<u>4 or more decayed or broken teeth/ roots, or very worn down teeth, or less than 4 teeth with no denture*</u>		1 or 2 = refer	<input type="checkbox"/> YES <input type="checkbox"/> NO
Denture(s) <input type="checkbox"/> Y <input type="checkbox"/> N	No broken areas/teeth, dentures worn regularly and name is on	1 broken area/tooth, or dentures only worn for 1 to 2 hours daily, or no name on denture(s)	<u>More than 1 broken area/tooth, denture missing or not worn due to poor fit, or worn only with denture adhesive*</u>		1 = ID denture 2 = refer	<input type="checkbox"/> YES <input type="checkbox"/> NO
Oral Cleanliness	Clean and no food particles or tartar on teeth or dentures	Food particles/ tartar/ debris in 1 or 2 areas of the mouth or on small area of dentures; occasional bad breath	<u>Food particles, tartar, debris in most areas of the mouth or on most areas of denture(s), or severe halitosis (bad breath)*</u>		1=intervention 2=refer	<input type="checkbox"/> YES <input type="checkbox"/> NO
Dental Pain	No behavioural, verbal or physical signs of pain	<u>Verbal and/or behavioural signs of pain such as pulling of face, chewing lips, not eating, aggression*</u>	<u>Physical signs such as swelling of cheek or gum, broken teeth, ulcers, 'gum boil', as well as verbal and or behavioural signs*</u>		1 or 2 = refer	<input type="checkbox"/> YES <input type="checkbox"/> NO

FOLLOW UP

Person and/or family/guardian refuses: a) Referral - Date: _____; b) Dental Treatment - Date: _____

Modified Oral Hygiene Care Plan - Date: _____

Oral Health Assessment to be repeated on - Date: _____

www.halton.ca/Health/programs/dental or www.rgpc.ca Halton Region's Health Department (2007) modified with permission from Chalmers (2004)

APPENDIX B. PRE-ORAL HEALTH INTERVENTION SURVEY

The following questions will collect information about you and your knowledge about oral health. Please circle the response that best describes your choice.

1. I am a ;
 1. A resident assistant:
 - a. attending college
 - b. not attending college
 2. A licensed practical nurse (LPN)
 3. A registered nurse with associate degree (RN)
 4. A registered nurse with a bachelor's degree (BSN, RN)

2. What is the highest level of education you have achieved?
 1. High school
 2. Some college courses
 3. College degree
 4. Graduate degree
 5. Some graduate courses

3. How old are you?
 1. 18 – 25
 2. 26 – 34
 3. 35 -44
 4. 45 and above

4. How many years of experience do you have in long term care?
 1. Less than 1 year
 2. 1- 3 years
 3. 4-6 years
 4. 6 or more

5. On the scale of 1-5 please rate the amount of education you have received about oral health.
 - 1
 - 2
 - 3
 - 4
 - 5

6. How important is oral health to the care you provide to your residents?
 1. Not important
 2. Somewhat important
 3. Not sure
 4. Important
 5. Very Important

7. Poor oral health can affect my residents' heart.
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

8. Poor oral health can affect my residents' lungs.
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

9. Poor oral health can alter blood sugars for my diabetic residents.
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

APPENDIX C. POST-ORAL HEALTH INTERVENTION SURVEY

The following questions will collect information about you and your knowledge about oral health. Please circle the response that best describes your choice.

1. I am a ;
 1. A resident assistant:
 - a. attending college
 - b. not attending college
 2. A licensed practical nurse (LPN)
 3. A registered nurse with associate degree (RN)
 4. A registered nurse with a bachelor's degree (BSN, RN)

2. What is the highest level of education you have achieved?
 1. High school
 2. Some college courses
 3. College degree
 4. Graduate degree
 5. Some graduate courses

3. How old are you?
 1. 18 – 25
 2. 26 – 34
 3. 35 -44
 4. 45 and above

4. How many years of experience do you have in long term care?
 1. Less than 1 year
 2. 1- 3 years
 3. 4-6 years
 4. 6 or more

5. On the scale of 1-5 please rate the amount of education you have received about oral health.
 - 1
 - 2
 - 3
 - 4
 - 5

6. How important is oral health to the care you provide to your residents?
 1. Not important
 2. Somewhat important
 3. Not sure
 4. Important
 5. Very Important

7. Poor oral health can affect my residents' heart.
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

8. Poor oral health can affect my residents' lungs.
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

9. Poor oral health can alter blood sugars for my diabetic residents.
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

10. How has this oral health education intervention affected your own oral health behaviors?

11. Additional comments:

APPENDIX D. STAFF PERCEPTION OF OHAT

The following questions will collect information about your background and your perception of Oral Health Assessment Tool. Please circle the response that best describes your choice.

1. I am a ;
 1. A resident assistant:
 - a. attending college
 - b. not attending college
 2. A licensed practical nurse (LPN)
 3. A registered nurse with associate degree (RN)
 4. A registered nurse with a bachelor's degree (BSN, RN)

2. What is the highest level of education you have achieved?
 1. High school
 2. Some college courses
 3. College degree
 4. Graduate degree
 5. Some graduate courses

3. How old are you?
 1. 18 – 25
 2. 26 – 34
 3. 35 -44
 4. 45 and above

4. How many years of experience do you have in long term care?
 1. Less than 1 year
 2. 1- 3 years
 3. 4-6 years
 4. 6 or more

5. Oral health assessment tool can help me recall what to look for when providing oral care
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

6. Oral health assessment tool can help me recall categories of the mouth that need to be assessed therefore improving my assessment skills
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

7. Oral health assessment tool has made me prioritize oral care as part of my daily patient care practices
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

8. Oral health assessment tool is a quick and easy tool to use daily.
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

6. I would like to continue using the oral assessment tool.
 1. Strongly Agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

7. I prefer to use oral assessment tool
 1. Daily
 2. Every other day
 3. Weekly basis
 4. Monthly basis.

5. Additional comments:

APPENDIX E. NURSE PRACTITIONER PERCEPTION OF OHAT

The following questions will collect information about your background and your perception of Oral Health Assessment Tool. Please circle the response that best describes your choice.

1. I am a ;
 1. A nurse practitioner with a doctorate degree
 2. A nurse practitioner with a master's degree
 3. A nurse practitioner without a degree.

2. What is the highest level of education you have achieved?
 1. Some college courses
 2. College degree
 3. Graduate degree
 4. Some graduate courses

3. How old are you?
 1. 18 – 25
 2. 26 – 34
 3. 35 -44
 4. 45 and above

4. How many years of experience do you have in long term care?
 1. Less than 1 year
 2. 1- 3 years
 3. 4-6 years
 4. 6 or more

5. Oral Health Assessment Tool can act as a reminder to assess oral health when doing my nursing home rounds?
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

6. Oral Health Assessment Tool is a quick and easy tool to use during nursing home rounds.
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

7. I would use Oral Health Assessment Tool during my rounds in the nursing home.
 1. Strongly Agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

8. Oral Health Assessment Tool can help me recall categories of the mouth that need to be assessed therefore improving my assessment skills
 1. Strongly agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

9. I could prescribe Oral Health Assessment Tool to be used as an assessment tool in the nursing home.
 1. Strongly Agree
 2. Agree
 3. Undecided
 4. Disagree
 5. Strongly disagree

APPENDIX F. FORMATTED OHAT

Category	Level of Changes	Action Taken
Lips	0. Normal, 1. Dry, chapped, or red at the corners 2. Swelling, or lump, white/red/ulcerated patch, <u>bleeding/ulcerated at corners</u>	None Nurse notified Oral Care intervention <ul style="list-style-type: none"> • Use of Lanolin, KY Jelly or Other lip lubricant • DO NOT use petroleum based products • Consider possibility of vitamin B deficiency • Monitor for 7 days – then refer if no change
Tongue	0. Normal (Moist and pink) 1. Patchy, fissured, red, coated 2. <u>Patch that is red and or white, ulcerated and swollen</u>	None Nurse notified Oral Care Intervention <ul style="list-style-type: none"> • Clean tongue twice daily with soft toothbrush or tongue scraper • Monitor changes
Gums and Tissues	0. Pink and moist, smooth, no bleeding 1. <u>Dry, Shiny, rough, red, swollen around 1 to 6 teeth</u> Sore spot under dentures 2. <u>Swollen, bleeding, loose teeth, ulcers or white patches, tenderness</u>	None Nurse notified Oral Care Intervention <ul style="list-style-type: none"> • Brush twice each day with soft toothbrush • Monitor bleeding gums • Refer if no improvement within 7 to 10 days.

Category	Level of Changes	Action Taken
Saliva	0. Moist tissues (normal) 1. Dry, sticky tissues, little saliva, resident thinks they have dry mouth 2. Tissues parched and red, <u>no saliva present, resident complains of dry mouth</u>	None Nurse notified Oral Care Intervention: <ul style="list-style-type: none"> • Check for medications causing dry mouth • Implement use of dry mouth products (sucking on ice chips, sugarless candy) • Increase fluid intake • Monitor for further changes
Natural teeth (Y or N)	0. No decayed or broken teeth/roots 1. <u>1-3 broken or decayed teeth/roots</u> 2. <u>4 or more decayed or broken teeth or very worn out teeth, or less than 4 teeth with no dentures</u>	None Nurse notified Oral Care Interventions <ul style="list-style-type: none"> • Twice daily or more oral hygiene care to prevent oral health issues • Monitor for changes • Refer to a dentist per facility protocol
Dentures (Y or N)	0. No broken areas, dentures worn regularly and name is on. 1. 1 broken area, dentures only worn 1-2 hours daily, or no name on dentures 2. More than 1 broken area, <u>denture missing or not worn due to poor fit, or worn only with denture adhesive</u>	None Nurse notified Oral Care Intervention <ul style="list-style-type: none"> • Identification of dentures • Implement vinegar soak for acrylic dentures or facility protocol • Refer to a dental professional per facility policy •

Category	Level of Changes	Action Taken
Oral cleanliness	<p>0. Clean and no food particles or tartar on teeth or dentures</p> <p>1. Food particles/tartar/debris in 1 or 2 areas of the mouth or on small area of dentures; occasional bad breath</p> <p>2. <u>Food particles, tartar, debris in most areas of the mouth or on most areas of dentures, or severe bad breath.</u></p>	<p>None</p> <p>Nurse notified</p> <p>Oral Care Intervention</p> <ul style="list-style-type: none"> • Brush teeth and oral tissues twice daily with a soft toothbrush • Monitor levels of plaque and debris
Dental Pain	<p>0. No behavioral, verbal or physical sign of pain</p> <p>1. Verbal and/or behavioral signs of pain such as <u>pulling of face, chewing lips, not eating, aggression</u></p> <p>2. Physical signs such as swelling <u>of cheek or gum, broken teeth, ulcers, 'gum boil', as well as verbal or behavioral signs</u></p>	<p>None</p> <p>Nurse notified</p> <p>Oral Care Intervention</p> <ul style="list-style-type: none"> • Twice daily or more oral hygiene care to prevent oral health issues • May require pain, antibiotic, antifungal or other medications • Monitor behaviors suggesting pain • Refer to a dentist if caries or abscess following facility protocol.

KEY: 0=NORMAL, 1=CHANGES, 2=UNHEALTHY.

Note: If resident has any of the underlined conditions they need referral or treatment per facility protocol.

Circle the action taken 1. Referred 2. Intervention 3. None

Adapted from 2007 Halton's regional health department.

APPENDIX G. FAMILY SURVEY

Please circle the choice that best represents your response.

After reading brochure:

1. How likely are you to seek dental treatment/services for your family member living in the nursing home?

1. Not likely
2. Somewhat likely
3. Very likely
4. Extremely likely
5. Don't know

2. How did the brochure influence your knowledge about oral health?

APPENDIX H. ORAL HEALTH BROCHURE



My Heart and the Mouth



Redness and swelling around my teeth and in my mouth not only affects the mouth but also the heart and its blood vessels which can put me at risk for heart attack and/or stroke.

My Diabetes and the Mouth

Due to high blood glucose as a result of diabetes, I am more likely to have problems with my teeth and gums. I can easily develop problems such as tooth decay, dry mouth and gum disease.

Due to my diabetes, if I develop gum disease I will have a difficult time controlling my blood sugars.

My Mouth and Pneumonia

When my mouth is dirty and unhealthy I can inhale into my lungs and I may develop pneumonia.

Pneumonia is a common cause of death in older adults living in the nursing home.

My general well-being and the mouth



- ❖ With an unhealthy mouth I am afraid to eat in public with my friends-I have problems chewing.
- ❖ With an unhealthy mouth I might be in pain but no one knows.
- ❖ With an unhealthy mouth I am very selective of my foods and therefore I might be getting less nutritious meals.
- ❖ With an unhealthy mouth my dentures might not fit very

APPENDIX I. POWERPOINT FOR EDUCATION INTERVENTION

ORAL HEALTH AND THE ELDER

BY NANCY NYONGESA

Oral health

- Being free of:
 - Chronic oral-facial pain conditions
 - Oral and pharyngeal cancers
 - Oral soft tissue lesions
 - Birth defects such as cleft lip and palate
 - Other diseases and disorders that affect the oral, dental, and craniofacial tissues.

Surgeon General, (Santho, 2000, pg. 11)

Consequences of poor oral health

- Difficulty eating properly
 - Affecting nutritional status
 - Body weight
- Co-morbidities ; diabetes and heart disease
- Communication
- Social isolation
- Poor quality of life
- Oral pain
- Dry mouth.

MacEntee, M(2011)

Oral Pain

- Prevalence: 1 in 10 adults, affects more than half of elderly population.
- Oralfacial pain in elders arises primarily from diseases affecting the teeth, periodontium, jaw joints, and oral mucosa.

MacEntee, M (2011)

Dry mouth and medications

- Dry mouth can lead to:
 - Abnormal taste sensation,
 - Halitosis (Bad Breath)
 - burning sensation around the mouth and tongue
 - Intolerance to acidic and spicy food.
 - Lose fitting dentures and sores from abrasive movements of dentures on the mucosa.
 - Impairs social interaction.
- Polypharmacy is a major contributor to dry mouth – xerogenic drugs.
- Examples of medication classes: ACE inhibitors, diuretics, alpha-blockers, beta-blockers, calcium channel blockers, antidepressants, anticholinergic

Diet and oral health

- Reduced ability to chew impacts the selection of foods and intake of nutrients hence putting older people at risk for malnutrition.
- Inability to chew properly leads:
 - To selection of softer processed foods that may be less nutritious.
 - To elder people avoiding social gathers due to perceived problems of chewing.

Oral health and diabetes

- Due to high blood glucose, residents with diabetes are more likely to have problems with their teeth and gums, including tooth decay, dry mouth and gum disease.
- Residents with diabetes who develop gum disease have difficulty controlling their blood sugars

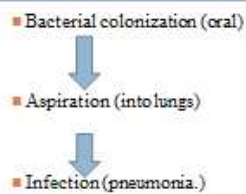
MacEntee, M (2011), Pg. 100

Oral health and heart disease

- Periodontal treatment reduces the levels of risk markers for cardiovascular disease (CVD) by decreasing, for instance, serum levels of C-reactive protein and increasing carotid elasticity.
- C-reactive protein is one of the risk markers for CVD

MacEntee, M (2011), pp. 96

Oral health and pneumonia



El-solh (2011)MacEntee, M (2011), pp. 118

References

- Depart of Health and Human Services (2000). Oral Health in America: A report of Surgeon General.
- El-Solh, A. A. (2011). Association between pneumonia and oral care in nursing home residents. *Lung*, 189, 173-180.
- Halton Region(2007). Introducing the Oral Health Assessment Tool (OHAT). www.rgpc.ca
- MacEntee, M. L, Muller, F, & Wyatt, C. (2010). Oral Healthcare and The Frail Elder: A clinical Perspective., Ames, IA: Wiley-Blackwell.

APPENDIX J. NDSU IRB APPROVAL

NDSU

NORTH DAKOTA STATE UNIVERSITY

Institutional Review Board

Office of the Vice President for Research, Creative Activities and Technology Transfer

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May 17, 2012

Donna Grandbois
Department of Nursing
Sudro 222K

IRB Approval of Protocol #PH12189, "Implementing an Evidence-Based Oral Health Assessment Tool (OHAT) in a Nursing Home"

Co-investigator(s) and research team: Nancy Nyongesa

Approval period: 5/17/12 to 5/16/13

Continuing Review Report Due: 4/1/13

Research site(s): Rosewood on Broadway, Fargo, ND

Funding agency: n/a

Review Type: Expedited category # 5, 7

IRB approval is based on original submission, with revised: protocol (received 5/17/2012) and consent documents (received 5/4/2012).

Additional approval is required:

- o prior to implementation of any proposed changes to the protocol (*Protocol Amendment Request Form*).
- o for continuation of the project beyond the approval period (*Continuing Review/Completion Report Form*). A reminder is typically sent two months prior to the expiration date; timely submission of the report is your responsibility. To avoid a lapse in approval, suspension of recruitment, and/or data collection, a report must be received, and the protocol reviewed and approved prior to the expiration date.

A report is required for:

- o any research-related injuries, adverse events, or other unanticipated problems involving risks to participants or others within 72 hours of known occurrence (*Report of Unanticipated Problem or Serious Adverse Event Form*).
- o any significant new findings that may affect risks to participants.
- o closure of the project (*Continuing Review/Completion Report Form*).

Research records are subject to random or directed audits at any time to verify compliance with IRB regulations and NDSU policies.

Thank you for cooperating with NDSU IRB procedures, and best wishes for a successful study.

Sincerely,



Kristy Shirley, CIP
Research Compliance Administrator

Last printed 5/17/2012 11:54:00 AM

NDSU is an EO/AA university.