The Oral Health Quality of Life for Seniors in Residential Facilities who Have Direct Access to Care as Compared to Those Without Access

A THESIS SUBMITTED TO THE FACULTY
OF THE DIVISION OF DENTAL HYGIENE SCHOOL OF DENTISTRY
UNIVERSITY OF MINNESOTA

BY

Jennafer Golden

IN PARTIAL FULFILLMET OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTERS OF SCIENCE IN DENTAL HYGIENE

Dr. Sheila Riggs

May, 2018

ACKNOWLEDGEMENTS

I would like to sincerely thank the entire University of Minnesota Division of Dental Hygiene graduate program faculty. Their guidance, patience and encouragement was unwavering. I would like to thank my advisor, Dr. Sheila Riggs, for providing solid critiques, advice, and enthusiasm towards my research, which helped me see the importance all the more.

Secondly, I would like to thank The Greenhouse and Westview Care Center and their staff for the permission to conduct my research, and for always accommodating and assisting when necessary.

Lastly, I would like to thank my children, Callan and Cole Van Nuys, as well as my partner Dan for understanding and supporting me through all the nights and weekends at my computer, and for the occasional proofread.

TABLE OF CONTENTS

List of Tables

SECTION 1

INTRODUCTION

Emerging evidence suggests a bidirectional relationship between the chronic inflammation of oral disease and serious systemic diseases such as diabetes, cardiovascular disease and pneumonia (1). The correlation is explicitly demonstrated in the elderly population within dependent residential facilities. Many face obstacles to good oral health, as most are medically compromised and cannot provide their own self-care. Consequently, the oral health status of this population is generally poor and has shown a negative impact on their quality of life (1, 2).

Theoretical Framework

The concept of successful aging aligns with the Holistic Comfort theory. According to the Comfort theory, comfort is an immediate desirable outcome of health care. Tested and validated by Katherine Kolkaba in the 1990's, the theory describes comfort as relief, ease and transcendence. For example, if specific comfort needs are met, as in the relief of pain, the individual experiences comfort in the relief category. If an individual is in a state of contentment, they are considered at ease in the spectrum of comfort. Lastly, transcendence is considered as the ability to rise above the challenges in one's health and exist in a state of comfort (3).

Kolkaba states, "holistic comfort is defined as the immediate experience of being strengthened through having one's needs for relief, ease and transcendence met in the realm of the physical, psychosocial, social and environmental aspects" (3). The theoretical structure of Holistic Comfort theory can clearly direct the care and goals for healthcare providers in any institution.

Public health physicians Ogden, et. al emphasized that maximum health can be achieved if prevention services are integrated across community and clinical settings, as many of these services are portable and this flexibility for access to care improves health outcomes (10). Preventive oral health services such as dental cleanings have been shown to improve health outcomes across population groups, yet few long-term residential facilities offer these services.

Purpose of the Study

The purpose of this study was to test whether there is a perceived difference in oral health and comfort for residents in long-term care facilities that receive preventive oral health services as compared to those that do not.

Statement of the Problem

The majority of long-term care residential facilities do not provide in-house oral health services for their residents. The absence of these services may severely compromise a senior's daily living activities in addition to their oral and general health. Studies have shown many older adults suffer with oral pain due to dental caries, have difficulty eating and have problems with social life because of oral disease (2). Oral health is important to psychological health as research has shown that adults with missing teeth have lower self-esteem and often avoid interacting with other people due to embarrassment (2). This vulnerable population is reliant on others to provide the care necessary to maintain their oral and general health. When oral care is neglected, seniors are not only at risk of a psychological and social impact but also have an increased risk for a variety of oral and systemic diseases (1, 2, 5).

Significance of the Study

Complete health is not possible without oral health. Therefore, society being greatly impacted by oral disease should have a vested interest in improving oral health outcomes. Statistics suggest several reasons alleviating barriers to oral health care in long-term facilities should be a priority. First, it is estimated individuals 65 and older will comprise over 20% of the U.S. population by the year 2030, and by the year 2040, it is estimated that four million people will reside in long term care facilities (2). Seventy-five percent of the baby boomer generation will enter long term care with most of their natural teeth emphasizing the need to prevent oral disease as their overall health declines (2). The increase in the number of retained teeth has critical implications for preventive services needed to maintain oral health in this population. New knowledge and perspectives gained through this research will provide data that will ideally show the importance of the comprehensive benefits for oral health prevention for seniors. Furthermore, study results may raise awareness and further research into this very critical situation.

Research Question

Is there a difference in the oral health quality of life for seniors in residential facilities that have direct access to dental prevention services compared to those who do not?

Null Hypothesis

There is no difference in the oral health quality of life for seniors in residential facilities that have direct access to dental prevention services compared to those who do not.

SECTION 2

REVIEW OF THE RELATED LITERATURE

The effects of prevention services on improved oral and systemic health is documented in the literature. While actual intervention studies were limited, the published studies examined presented three central themes; barriers to daily oral care, compromised oral health and systemic health conditions of those in residential facilities, and the relationship between oral and systemic health and well-being, and preventive oral health services.

Barriers to Daily Care

Research has shown several barriers such as lack of money, attitudes of caregivers, inadequate access to oral care services and, physical disabilities prevent seniors from caring for their own mouth without assistance (11). Unfortunately, the majority of professional caregivers are not effectively addressing the problem (11).

Several studies have reported on reasons for the lack of nursing assistance with oral care. Lindquist, et al., conducted a qualitative study using personal interviews of 23 staff members in three different nursing home facilities in Sweden. The investigators purposively selected care managers, registered nurses and nursing assistants for the study. Findings identified three underlying themes: 1) organization: a clearly defined plan for oral care procedures did not exist; 2) staff approach: the health care priorities and competencies were not aligned with oral hygiene; and, 3) staff views: staff were not aware of the importance of good oral health and considered oral care a personal option (11). In contrast, Porter, et al., found when researching the impact of oral health on the quality of life of nursing home residents, the majority of managers and care givers were

aware of an oral health assessment and care plan, but felt that the staff needed proper training and the ability to refer for dental services (12).

Results of Compromised Oral Care in Residential Facilities

Research supports that oral hygiene is a vital care service needed in long-term care facilities. Residents are more susceptible to periodontal disease, salivary changes, oral candidiasis, denture stomatitis, and nutritional deficiency, as well as other medical problems (1,2). Their susceptibility comes from broken or missing teeth and/or loose or broken dentures, as well as other conditions that affect the elderly (2,3,11). Xerostomia, defined as dry mouth due to inadequate saliva, is among the common oral problems of the elderly because many of the medications prescribed for chronic illnesses have dry mouth as an adverse effect (9). This presents complications with remineralization ability, diminished pH and buffering capabilities, increased development of caries, increased retention of oral debris and difficulty with chewing and swallowing (11). The effects of oral health services on xerostomia was demonstrated by a study conducted by Huang, Ho, and Liang (9). They concluded the long-term care facilities with higher dry mouth complications were those that did not undergo regular oral examinations thus preventing potential interventions (9).

Specifically, eating is an important part of quality of life, whether it is social or nutritional or recreational, inadequate nutrition can lead to many health issues. A multitude of studies have shown that elderly adults have reduced salivary flow (xerostomia) due to a variety of etiologies, consequently, leading to perceived chewing and swallowing difficulties (10). It has also been determined that xerostomia has been associated with poor nutrition but very few studies have specifically shown what

nutrients are missing from the reduced saliva elder diet. Researchers Iwasaki, et. al, investigated the nutritional intake effects that xerostomia may impact (10). A cross sectional study was conducted with 350 elderly volunteers measuring the nutritional intake of those with xerostomia compared to those with adequate saliva. The study showed significant lower absorption of fatty acids, potassium, and vitamins D, E and B6 in the xerostomia group (10). Eating is an important part of quality of life, whether it is social or nutritional or recreational, and in turn, inadequate nutrition can lead to many health issues.

The Relationship Between Oral and Systemic Health and Preventive Services

Achieving quality preventive oral health services in long term care facilities has been a challenge despite awareness that less than optimal oral health has been accepted as the standard in this population. However, research has shown significant improvement in patient's oral health outcomes when receiving care by oral health professionals. Amerine, et al., conducted a pre/post intervention pilot study on the quality of life and oral health in three long term care facilities in Arkansas, utilizing the Oral Health Assessment Tool (OHAT) and the Geriatric Oral Health Assessment Index (GOHAI) (4). Facility A (n=27) received the intervention of professional care plus education and support to caregivers. Facility B (n=31) received education only and Facility C (n=20) was the control group that received no treatment. The eight week randomized control study demonstrated statistically significant improvement in the intervention group with regards to tongue health, denture status and overall oral hygiene (4). A similarly executed study by Naito, et.al, although measuring quality of life (QOL) before and after prevention services, found dental treatments for the institutionalized elderly improved

QOL and demonstrated the benefit of having oral care services onsite in long term care facilities (5).

While actual intervention studies have been limited, several studies have concentrated on oral health and the prevention of pneumonia in residential care homes. Bacterial colonization of the oral cavity followed by aspiration of bacteria-laden oropharyngeal secretions remains the most common path of infection for typical pneumonia (5,6). Adachi, et al., and Ishikawa, et al. independently conducted informative studies. Adachi and colleagues performed an intervention study of 216 nursing home residents over a 24-month period measuring professional oral health care (POHC) and the incidence of pneumonia. One group received daily oral care plus weekly mechanical cleaning and the second group received basic hygiene involving swabbing oral tissues with a disposable sponge and denture cleaning. The study found a 2.67 times higher incidence of fatal aspiration pneumonia in the non-POHC group in the 24 months (5). Ishikawa's results were not as statistically significant but still showed improvement of respiratory health. Their randomized control study encompassed 417 residents. The treatment group received daily tooth brushing, plus scrubbing of the pharynx with iodine, in addition to professional care once a week. Their results produced a 1.67 higher risk for developing pneumonia in the non-treatment group (6). However, both studies concluded a combination of mechanical and chemical oral cleaning resulted in a significant reduction in the number of potential respiratory pathogens in the oral cavity (5,6).

Bassim et al., had daily oral hygiene care performed for 143 residents by nursing assistants as the treatment group. Initial results demonstrated the same incidence of mortality from pneumonia as the non-intervention group until the data was adjusted for

their risk factors. Once these were calculated they found the odds of fatal pneumonia to be 3.57 times higher in the non-intervention group (8). Understanding that oral health status is influenced by a multitude of factors, implementation of strategies for preventive services has demonstrated improved effects on health (8).

Despite the evidence supporting oral care, implementing preventive oral health care services has been a challenge. It is known that retained teeth correlate to overall health, thus professional oral health services are necessary in long term care facilities. Therefore, the purpose of this study was to test whether there is a perceived difference in oral health and comfort for residents in long-term care facilities that receive preventive oral health services as compared to those that do not.

SECTION 3

SYNOPSIS

Introduction: Many residents of senior residential facilities face obstacles to good oral health as most are medically compromised and cannot provide adequate self-care. Consequently, the oral health status of this population is generally poor and has a negative impact on quality of life. The purpose of this study was to test whether there is a perceived difference in oral health and comfort when residents in long-term care facilities receive direct access to a dental cleaning compared to facilities who brush and floss only.

Objective**:** The purpose of the study was to compare the Oral Health Impact Profile-5(OHIP-5) between treatment and control groups in senior long term care facilities.

Methods: The study design was quasi-experimental. The study took place in two senior residential facilities in Sheridan, Wyoming. Fifteen residents from each facility comprised the study sample (n=30). The treatment group received a dental cleaning and oral hygiene education and the control group received brushing, flossing, and oral hygiene education. There were two interventions, two months apart. A pre/test was conducted using the 5 question Oral Health Impact Profile, shortened version. Post test was conducted one month after the last intervention.

Results: Fifteen residents from the treatment facility and the control facility comprised the study sample (n=30). The treatment group was comprised of 13% male subjects and 87% female subjects with an average age of 85. The control group had 40% male subjects and 60% female subjects with and average age of 76. The percent of subjects who do not receive regular dental care at a private dentist was 53% of the treatment group and 40% of the control group. Active caries and chronic periodontitis were also present in both groups; caries were detected in 67% of the subjects in the control group and 87% in the

treatment group. Results revealed a significant difference in pre/post OHIP-5 scores in the treatment group (p=0.0222). The control group had improved scores but it was not significant (p=0.5331). The significant univariate association was between caries and OHIP-5 scores (p=0.0082).

Conclusions: This study demonstrated a significant difference in the perception of oral health quality of life when seniors received a dental cleaning where they reside. Findings support existing knowledge and evidence that oral health services improve the functional status and quality of life of senior adults living in long-term care facilities.

MANUSCRIPT

This manuscript will be submitted to the _____Journal

Introduction and Literature Review

The unprecedented aging of the U.S. elderly population has brought new challenges in access to oral health care. In the US, the population aged 65 and over is projected to be 83 million by the year 2050 (17). Current evidence suggests that poor oral health is a risk factor as the inflammation of oral disease adds to the overall systemic inflammatory burden of diseases such as diabetes, cardiovascular disease and pneumonia (1,16). The correlation is explicitly demonstrated in the elderly population within dependent residential facilities. Many face obstacles to good oral health as most are medically compromised, have loss of functional abilities and cannot provide their own adequate self-care. Consequently, the oral health of this population is generally poor and has had a negative impact on their quality of life (1,2). Reliant on others to provide the care necessary to maintain their oral health places the elderly at risk for negative psychological and social consequences and increases their risk for a variety of oral diseases (2).

Achieving quality preventive oral health services in long term care facilities has been a challenge despite awareness that less than optimal oral health has been accepted as the standard in this population. However, research has shown significant improvement in patient's oral health outcomes when receiving care by oral health professionals. Amerine, et al., conducted a pre/post intervention pilot study on the quality of life and oral health in three long term care facilities in Arkansas. The eight week randomized control study demonstrated statistically significant improvement in the intervention group

with regards to tongue health, denture status and overall oral hygiene (4). A similar study by Naito, et.al (2010), measured quality of life (QOL) before and after prevention services and found dental treatments for the institutionalized elderly improved QOL and demonstrated the benefit of having dental care service onsite in long term care facilities (5). Additionally, Portella, et. al conducted a study to measure the impact of an oral hygiene education program with specific guidelines for caregivers at long term care facilities to provide and assist residents with their oral hygiene care. The one year study resulted in statistically significant reduction of plaque index. Arguably, Tandheelkd, N. conducted an evaluation of the implementation of guidelines for oral care in several dependent care facilities only to find the nursing staff were aware of the guidelines but implementation on a daily routine was insufficient (18).

Several studies have reported the reason for the lack of nurse assistance with oral care. Lindquist, et al., conducted a qualitative study with personal interviews of 23 staff members of three different facilities in Sweden. The researchers intentionally chose care managers, registered nurses and nursing assistants. The findings identified three underlying themes: organization-no clear defined plan for oral care procedures; staff approach-the health care priorities and competencies were not aligned with oral hygiene; and staff views-staff were not aware of the importance of good oral health and considered oral care a personal option (11).

Background

The majority of long-term care residential facilities do not provide in-house oral health services for their residents (15). The absence of these services may severely compromise the senior's daily living activities in addition to their oral and general health.

Studies have shown many older adults suffer with oral pain due to dental caries, have difficulty eating and have problems with social life because of oral disease (3). Oral Health America provided additional data in the report "A State of Decay" utilizing the Basic Screening Survey (BSS) for older adults in long-term care (19). Many states have implemented the BSS to assess the oral health disparity in the elderly population. For example, Minnesota screened 1,032 seniors residing in long-term care and found three in five older adults have fewer than 20 teeth necessary for eating, speaking, and socializing. Seniors that needed dental care including untreated tooth decay were found to be 42% of those screened (19).

Despite the evidence of the importance of oral care that has been brought forth by the literature, implementing preventive oral health care services has been a challenge. It is known that retained teeth correlate to overall health thus professional oral health services are necessary in long term care facilities. Therefore, the aim of this study was to test whether there is a perceived difference in oral health and comfort for residents in long-term care facilities that receive preventive oral health services as compared to those that do not.

Methods and Materials

The study was approved by the University of Minnesota (IRB# 1611M00921). The study was a quasi-experimental pre-test/post-test control group design and took place at two long-term care senior residential living facilities in Sheridan, Wyoming. Both sites are private skilled nursing facilities for seniors 60 and above, who require constant care. Subjects. A convenience sample of fifteen residents at each facility was used in order to obtain a population of senior adults who live together under the same conditions and care.

The Greenhouse has portable dental units in the facility equipped for rendering oral health care services and therefore was used as the treatment group. Westview Health Care Center served as the control group, as it does not have dental equipment available to provide oral hygiene care other than brushing and flossing. Power analysis determined 30 residents were needed from each facility in order to produce statistically significant results. However, due to the limitations of the study, specifically cognitive ability to answer the OHIP-5 questions, only 15 from each facility enrolled.

Inclusion criteria stipulated subjects must be residents living in either facility, possess cognitive function to consent and communicate responses to the OHIP-5 questionnaire, be dentulous or at least partially edentulous (6 or more natural teeth), be fluent in English and be age 60 or older to be included in the study. Exclusion criteria were being edentulous and/or possessing the cognitive inability to communicate answers to the OHIP-5 questionnaire.

Both facilities were contacted by the PI and provided the details of the study, including subject inclusion/exclusion criteria. Each facility agreed to participate and provided a letter of authorization for the participation in the research project. The social workers from the Greenhouse and Westview facilities initially screened the residents' health records to determine their eligibility to participate in the study. Oral health status, and subject's cognitive ability assessment at the intake of admission specifically reviewed. The PI conducted an interview and final oral screening of residents to confirm inclusion criteria were met. If a resident met the inclusion criteria, information about the study was presented and informed consent obtained (see Appendices F and G). The PI made the final determination with regard to a resident meeting the inclusion criteria.

Additionally, periodontal debridement (the scaling of teeth using dental hygiene instruments) and non-debridement procedures (limited to brushing and flossing) were performed solely by the PI at each facility.

Data Collection Instrument. The instrument chosen was the validated and modified Oral Health Impact Profile-5 (14). Validation recently took place and is documented in the study "Validation of the English-language Version of 5-item Oral Health Impact Profile" (14). Researchers at the University of Minnesota conducted a study to test its psychometric properties for dimensionality, reliability and validity among the general adult population (15). Naik, A., et. al also determined the shortened instrument had increased appeal and was technically more feasible in settings where the burden to collect and interpret the longer versions proved to be difficult (14). While oral health is multidimensional, both studies concluded that when using OHIP-5 a single score could determine the various aspects of oral health related quality of life (OHRQoL) (15).

The OHIP-5 explores four dimensions: oral function, orofacial pain, orofacial appearance, and psychosocial impact. For each of the five questions subjects are asked how often they have experienced the problem in the last month. Responses are on a scale of 0-never, 1-hardly ever, 2-occasionally, 3-fairly often, 4-very often.

Procedures. For subjects in both the control and the treatment groups, the PI performed an oral assessment that included a periodontal assessment using the American Academy of Periodontology (AAP) guidelines, and DMFT index to determine caries status. Subjects in the treatment group completed the OHIP-5 questions. The PI proceeded with periodontal debridement (removal of hard and soft deposits below and above the gumline using dental scalers), oral hygiene education and recommendations for a dentist referral if

indicated. Subjects in the control group completed the OHIP-5 questionnaire, however, no periodontal debridement services were performed only brushing and flossing and oral hygiene education were provided. Initial data were entered into a data management program for statistical analysis. Two months later the same procedures were repeated for subjects in both study groups. And a post OHIP-5 survey was administered one month later. Data was entered into the data management program for final analysis.

Statistical analysis. Descriptive statistics were used to summarize demographic data. To establish baseline equivalence, demographic variables and pretest OHIP-5 scores were compared between the control group and treatment group using two-group t-tests (or Wilcoxon two sample tests) for continuous variables and chi-square test (or Fisher's exact tests) for categorical variables. Paired t-tests were conducted to compare pretest/posttest OHIP-5 scores of control group and treatment group, separately. A repeated measures model (mixed model with random subject effect) was used to explore the association between the OHIP-5 scores and variables such as those with varying periodontal disease levels and existing dental caries. The level of significance (alpha) was set at $p \leq 0.05$ for all analyses. Statistical analysis of quantitative data was conducted using SAS/STAT© software V9.1.3 or higher.

Results

For this study, in order to obtain the data needed to test the significant relevance between oral health care treatment for institutionalized seniors and quality of life, fifteen residents from the treatment facility (GRNH) and the control facility (WV) comprised the study sample (n=30). The treatment group was comprised of 13% male subjects and 87% female subjects with an average age of 85. The control group had 40% male subjects and

60% female subjects with and average age of 76, although two of the control subjects (1 male and 1 female) were unable to complete the study. Fisher's exact test for categorical variables calculated a significant difference (p=0.0156) of mean age between the two groups with the treatment group being older; suggesting this group had retained their teeth and cognitive ability longer than the control group.

The length of time subjects had resided at their facility ranged from 6 months to 4 years with an average length of time of 1.5 years. The percent of subjects who did not receive regular dental care at a private dentist was 53% in the treatment group and 40% in the control group. Active caries and chronic periodontitis were also present in both groups; caries were detected in 67% of the subjects in the control group and 87% in the treatment group (Table 1). Chronic periodontitis ranged from slight to severe and was noted in all of the subjects in both facilities (see Table 1).

The univariate association between pre/post OHIP-5 scores and age, gender, time at facility, care at private dentist, existing tooth decay, level of periodontitis, and whether or not they provide their own oral hygiene care was examined. Only caries showed a statistically significant association with total OHIP-5 score (p=0.0082). It should be noted that the OHIP-5 score showed a trend toward significance among the variables periodontal disease status and whether the subjects provide their own self-care (p=0.0667 and p=0.0517 respectively). (Table 4)

When looking at pre/post scores within the control and treatment groups there was a significant difference in pre to post OHIP-5 scores in the treatment group (p=0.0222) (See Table 3). The mean pre-score was 2.8 and post mean score was 1.5, demonstrating the intervention of periodontal debridement and oral hygiene instruction had an effect on

subjects' perception of oral health. Paired t-tests compared the pre/post OHIP-5 scores and found the control group did have a slight change from a mean score of 3.9 to 3.4 after they received tooth brushing and flossing and homecare instructions but it was not significant ($p=0.5531$). The treatment group, however, did show a statically significant difference between pre/post treatment scores ($p=0.0222$) (Table 3).

Discussion

Good oral health is inextricably linked to a person's quality of life, affecting one's life daily with chewing, smiling, swallowing, appearance, and social interaction (12). A functional dentition free of oral disease is imperative to "successful aging", a term used to address perceived satisfaction of good health and happiness including the value of a healthy smile that directly affects self-esteem, comfort, and nutrition (12). This study supported these assertions. Seniors perception of oral health quality of life was higher in senior residential facilities who provided periodontal debridement services onsite (n=15) compared to seniors who only received brushing and flossing at their facility (n=15). A statistically significant improvement in OHIP scores pre to post treatment demonstrated oral health services within long-term senior care facilities can improve the oral health quality of life of their residents- thus improving overall health. Pre-post OHIP scores showed a slight improvement in the control group, however, was not statistically significant.

The results of this study support previous findings in the literature. Mannen addressed the impact of oral health on quality of life in the aging population in her 2014 study. Mannen measured the subject's oral health status and correlated that with their

perception of the subject's quality of life and found statistical significance between poor oral health and their perception of quality of life (18).

Findings also reinforced similar outcomes by Dahm et. al with regard to the reasons for lack of dental hygiene care in long-term care facilities:

Lack of supplies

It was observed in both facilities the residents were issued a low-quality hard toothbrush along with off-brand dentifrice, no other oral aids were provided such as floss or interdental aids. Many of the residents did not have the means to purchase or acquire these products.

Lack of dental hygienist interest

This population group is more difficult to access due to the complexity of providing services and reimbursement, as well as the ergonomic difficulties. A dental hygienist or an oral health provider is well positioned to implement oral health prevention services and integrate the importance of oral health with the senior's general health, leading to improved quality of life.

Currently, no standard of care model exists for providing dental services in long-term care facilities. However, there are several models available for delivering care to senior long term residents such as traditional transport, tele-health dentistry and mobile equipment being brought to the facilities depending on the state practice acts. While these models exist, they require complex, collaborative and interprofessional team efforts (17). All aspects of the resident's oral care require coordination of multiple care providers from daily oral hygiene, identifying need for professional care, acquiring necessary consent and obtaining reimbursement. Although an adequate oral health workforce may

be in the community, portable or mobile equipment needed to provide treatment is not present in long-term care facilities. Providing oral services to a patient who is bed ridden or in a wheelchair presents ergonomic difficulty.

Caregivers do not recognize the importance of providing daily care

Many of the certified nurse assistants that were observed in this study had several oral health problems of their own suggesting they may not see prevention as important. There are many training programs as well as requirements for staff in long term care facilities to learn about how to provide oral care, but inevitably they do not have the depth of knowledge required to provide oral hygiene to residents in a manner that is safe and effective for themselves and to the resident.

Resident is resistant to oral care

There is low priority given to oral health regulations within the nursing home facilities resulting in minimal or no mouth care for those who refuse or are viewed as not cooperative (17). Data in this study showed 93% of the subjects reported doing their own care. Considering the subjects overall physical inability, it was obvious through assessment of oral hygiene status, existing caries and periodontal disease status that regardless of their willingness to do their own oral care, they need professional assistance. Improved OHIP scores in the control group in this study suggests that even minimal care including homecare instructions and providing aids to assist the residents with their oral hygiene self-care did make a difference.

Successful aging means essentially living the life you want to live without being inhibited by disease and sickness. Independence and good health, including oral health have both been identified as indicators of quality of life (12, 13). Therefore, health

initiatives targeting this aging population should be designed to protect quality of life and empower institutionalized older individuals to optimize their health and well-being. Further studies showing the benefits of professional oral health services for this population are necessary to provide additional evidence for this serious health disparity.

This study presented several limitations. External validity may be cause for concern. Subjects interviewed may have answered the questions inadequately due to a variety of reasons such as wanting to please the interviewer, power of suggestion, personality influences, or perhaps a lack of mental clarity to honestly answer the questions. The small sample size is acknowledged to be the most predominate limitation that may have led to reduced statistical power. The limitation of subject numbers was influenced by the exclusion criteria; the ability to have the cognitive function to answer the questions pertaining to oral function, physical pain, orofacial appearance and social disability. Subjects in this study became residents of long-term facilities because they were either cognitively or physically impaired, or both, or could no longer perform the tasks of daily living. It was also observed that this circumstance had an influence on mood. Some residents, who declined participation, responded they “did not feel like it” or “no thank you my teeth are fine”. Lastly, the subjects were assessed for periodontal disease status and obvious existing caries but did not have clinical measurements such as plaque index, periodontal probe measurements with bleeding points nor radiographs to assess bone level and extent of caries. A clinical study utilizing clinical measurements before and after treatment, as opposed to their perception of oral health might show a broader variety of outcomes.

Conclusion

This study revealed that there was a significant difference in the perception of oral health quality of life when seniors received periodontal debridement services where they reside. Study findings support existing knowledge and evidence that oral health services improved the functional status and quality of life for senior adults living in long-term care facilities.

SECTION 4

TABLES

Table 1 Sample Characteristics

Demographic Characteristics	Total Subjects	Treatment (percent) N=15	Control (percent) N=15
Age			
60-65	2	6.67	6.67
66-76	5	0.00	33.33
77-85	7	13.33	33.33
86-95	14	66.67	26.67
96-105	2	13.33	0.00
Gender			
Male	8	13.33	40.00
Female	22	86.67	60.00
Length of Stay			
Less than 1 year	12	40.00	40.00
1-3 years	16	46.67	60.00
4-6 years	2	13.33	0.00
Private DDS			
yes	16	46.67	60.00
no	14	53.33	40.00
Caries			
yes	21	73.33	66.67
no	9	26.67	33.33
Periodontal Classification			
Mild periodontitis	14	46.67	46.67
Moderate periodontitis	13	40.00	46.67
Severe periodontitis	3	13.33	6.67
Self Care			
yes	28	93.33	93.33
no	2	6.67	6.67

Table 2: Pre/Post Mean Scores by Facility

nursing facility	N	Variable	N	N Miss	Mean	Std Dev	Median	Minimum	Maximum
Treatment	15	pre_OHIP5_score	15	0	2.8	2.9	1.0	0.0	9.0
		post_OHIP5_score	15	0	1.5	2.3	0.0	0.0	6.0
		diff_OHIP5	15	0	-1.3	1.9	-1.0	-5.0	3.0
Control	15	pre_OHIP5_score	15	0	3.9	4.8	3.0	0.0	17.0
		post_OHIP5_score	13	2	3.4	3.8	2.0	0.0	11.0
		diff_OHIP5	13	2	-0.5	2.7	0.0	-6.0	4.0

Table 3 Paired t-test pre-post OHIP-5 score by facility

Pre-post OHIP-5 score change	Paired t-test
Treatment	p=0.0222
Control	p=0.5531

Table 4-Univariate Association

Age	p=0.8156
Gender	p=0.3210
Time at Facility	p=0.7436
Private DDS	p=0.4124
Caries	p=0.0082
Periodontal status	p=0.0667
Self-care	p=0.0517

SECTION 5

PRACTICAL APPLICATION

The significance of these results will ideally encourage further research for this critical health disparity. Understanding that this was a pilot study with a small subject size, the results showed improved perception of oral health quality of life. For dental hygiene education, it is my hope that students will have the opportunity to learn about the importance of caring for this population and have clinical experiences providing prevention services.

This population is of interest to me because of the significant nature of the oral systemic correlation and the vulnerability of institutionalized seniors. I hope that these results will inspire further clinical research.

SECTION 6

REFERENCES

1. Haumschild MS, Haumschild RJ. The importance of oral health in long-term care. J Am Med Dir Assoc [Internet]. 2009 Nov;10(9):667-71.

2. Dahm TS, Bruhn A, Lemaster M. Journal of dental hygiene : JDH / american dental hygienists' association. . 2015;89(4):229-37.

3. Kolcaba, K. (2010). An introduction to comfort theory. In The comfort line. Retrieved November 10, 2010, from http://www.thecomfortline.com/

4. Amerine C, Boyd L, Bowen DM, Neill K, Johnson T, Peterson T. Oral health champions in long-term care facilities-a pilot study. Spec Care Dentist [Internet]. 2014 Jul-Aug;34(4):164-70.

5. Naito M, Kato T, Fujii W, Ozeki M, Yokoyama M, Hamajima N, Saitoh E. Effects of dental treatment on the quality of life and activities of daily living in institutionalized elderly in japan. Arch Gerontol Geriatr [Internet]. 2010 Jan-Feb;50(1):65-8.

6. Adachi M, Ishihara K, Abe S, Okuda K. Professional oral health care by dental hygienists reduced respiratory infections in elderly persons requiring nursing care. International Journal of Dental Hygiene [Internet]. 2007;5(2):69-74.

7. Ishikawa A, Yoneyama T, Hirota K, Miyake Y, Miyatake K (2008)Professional oral health care reduces the number of orophayngeal bacteria. J Dent Res 87: 594-598

8. Bassim CW, Gibson G, Ward T, Paphides BM, DeNucci DJ. Modification of the risk of mortality from pneumonia with oral hygiene care. J Am Geriatr Soc [Internet]. 2008;56(9):1601-

9. Huang YC, Chu CL, Ho CS, Lan SJ, Chen WY, Liang YW, Hsieh YP. Factors affecting institutionalized older peoples' self-perceived dry mouth. Qual Life Res [Internet]. 2015 Mar;24(3):685-91.

10. Ogden L, Richards C. Clinical Prevention Services for older adults. American Journal of Public Health. 2012Mar;102(3).

11. Lindqvist L, Seleskog B, Wardh I, von Bultzingslowen I. Oral care perspectives of professionals in nursing homes for the elderly. Int J Dent Hyg [Internet]. 2013 Nov;11(4):298-305.

12. Porter J, Ntouva A, Read A, Murdoch M, Ola D, Tsakos G. The impact of oral health on the quality of life of nursing home residents. Health Qual Life Outcomes [Internet]. 2015 Jul 15;13:102,015-0300-y.

13. Healthy People 2020. Retrieved from: https://www.healthypeople.gov/

14. Naik A, John M, Kohli N, Self K, Flynn P. Validation of the English-language version of 5-item oral health impact profile. Journal of Prosthosontics Research. 2016 Jan: 85-91

15. Delgado A, Prihoda T, Nguyen C, Hicks B, Smiley L, Taverna M. Professional Caregivers' Oral Care Practices and Beliefs for Elderly Clients Aging In Place. JDH 2016 Aug 90 (4)244-248

16. Portella F, Rocha A, Haddad D, Fortes C, Fernando H, Padilha D, Samuel S. Oral Hygiene Caregivers' Educational Program Improves Oral Health Conditions in Institutionalized Independent Elderly. Gerondontology. 2015 32 28-34

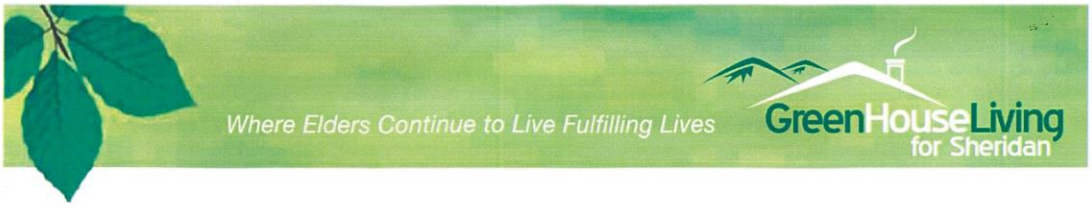
17. Mertz E, Wides C. Evolving delivery models for dental care services in long-term care settings: 4 state case studies. Oral Health Workforce Research Center, Center for Health Workforce Studies, School of Public Health, SUNY Albany; January 2016.

18. Mannen, J. Impact of oral health on QOL in aging. EWU Master's Thesis Collection. Paper 218. 2014

19. A State of Decay, Are Older Americans Coming of Age Without Oral Health Care? Oral Health America [Internet]. 2018Jan;IV. Available from: https://oralhealthamerica.org/astateofdecay/

APPENDICES

Appendix A-Letter of Support



September 20, 2016

University of Minnesota IRB

RE: Letter of Support for IRB approval- Jenna Golden, Graduate Student

Dear IRB members,

As the Administrator of Green House Living for Sheridan, I am pleased to give my full support of the principal investigator, Jenna Golden, and the University of Minnesota to recruit participants and conduct the study: "The Functional Status and Oral Health Quality of Life for Seniors in Residential Facilities who Have Direct Access to Care Compared to Those Without Access at Greenhouse Living for Sheridan".

If you have any further questions, please do not hesitate to contact me.

Sincerely,

Chris Szymanski

Chris Szymanski,
Administrator

2311 Shirley Cove
Sheridan, WY 82801
307-672-0600

Appendix B-Letter of Support

Westview Health Center
1990 W. Loucks St., Sheridan, WY 82801
Sheridan, Wyoming 82801

Dear IRB Committee,

As Director of Nursing, I and our administrator are pleased to give full support of the principal investigator, Jenna Golden and University of Minnesota to recruit participants and conduct the study: The Functional Status and Oral Health Quality of Life for Seniors in Residential Facilities who Have Direct Access to Care Compared to Those Without Access here at Westview Health Care Center.

Sincerely,

Dawn Morgan RN, DON

Appendix C-IRB Approval

February 22, 2017

Jennafer R Golden

RE: "A comparison study to test the functional status and oral health quality of life for seniors in residential facilities who have direct access to oral health prevention services compared to those without access"

IRB Code Number: **1611M00921**

Dear Jennafer R. Golden:

The Institutional Review Board (IRB) received your response to its stipulations. Since this information satisfies the federal criteria for approval at 45 CFR 46.111 and the requirements set by the IRB, final approval for the project is noted in our files. Upon receipt of this letter, you may begin your research.

IRB approval of this study includes the control consent form received February 16, 2017, and the treatment consent form received February 16, 2017.

The IRB would like to stress that subjects who go through the consent process are considered enrolled participants and are counted toward the total number of subjects, even if they have no further participation in the study. Please keep this in mind when calculating the number of subjects you request. This study is currently approved for 60 subjects. If you desire an increase in the number of approved subjects, you will need to make a formal request to the IRB.

On January 14, 2017, the IRB approved the referenced study through January 13, 2018, inclusive.

The Assurance of Compliance number is FWA00000312 (Fairview Health Systems Research FWA00000325, Gillette Children's Specialty Healthcare FWA00004003). Research projects are subject to continuing review and renewal. You will receive a report form two months before the expiration date. If you would like us to send certification of approval to a funding agency, please tell us the name and address of your contact person at the agency.

As Principal Investigator of this project, you are required by federal regulations to inform the IRB of any proposed changes in your research that will affect human subjects. Changes should not be initiated until written IRB approval is received. Unanticipated problems or serious unexpected adverse events should be reported to the IRB as they occur. Notify the IRB when you intend to close this study by submitting the Study Inactivation Request Form.

The IRB wishes you success with this research. If you have questions, please call the IRB office at 612-626-5654.

Sincerely,

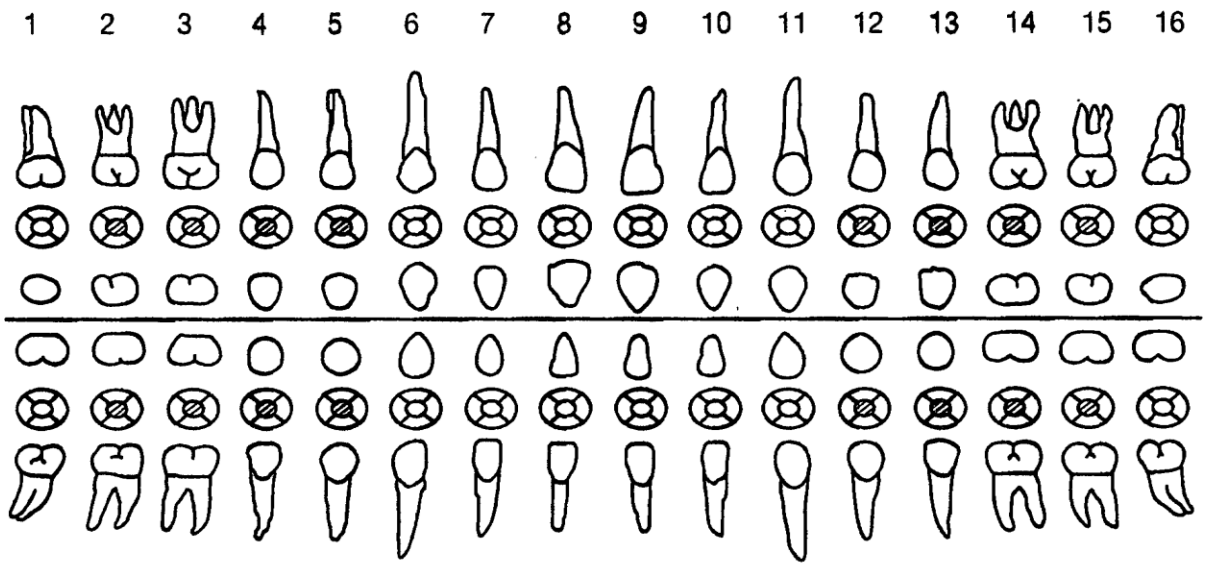
Clinton Dietrich, MA, CIP

IRB Analyst

Appendix D-OHIP 5 Survey

05 item Oral Health Impact Profile	0-never 1-hardly ever 2-occassionally 3-fairly often 4-often
1) Have you had difficulty chewing any foods because of problems with your teeth, mouth, dentures or jaw?	
2) Have you had painful aching in your mouth?	
3) Have you felt uncomfortable about the appearance of your teeth, mouth, dentures or jaws?	
4) Have you felt that there has been less flavor in your food because of problems with your teeth, mouth, dentures or jaws?	
5) Have you had difficulty doing your usual jobs because of problems with your teeth, mouth, dentures or jaws.	

Appendix E-DMFT Index



Permanent Teeth

0-sound

D-1-decayed

D-2-decayed and filled

F-3-filled, no decay

M-4-missing due to caries

M-5-missing, other reason

DMFT:

D_____ M_____ F_____ =_____

Total DMFT=_____ / 28 * 100%= Total DMFT

Appendix F-Consent Form (Treatment)

CONSENT FORM-Treatment Group

"The Oral Health Quality of Life for Seniors in Residential Facilities who Have Direct Access to Care Compared to Those Without Access"

You are invited to participate in a research study of assessing the oral health quality of life when receiving dental prevention services in your residential living facility. You were selected as a possible participant because you have more than six natural teeth and reside at either Greenhouse Living or Westview Health Care Center. We ask that you read this form or have it read to you and ask any questions you may have before agreeing to be in the study.

Jenna Golden, University of Minnesota, School of Dentistry, and Masters of Dental Hygiene student is the principal investigator and conducting this study.

Study Procedures

If you agree to participate in this study, we would ask you to do the following: Complete a survey that may take 5-10 minutes and receive a dental cleaning.

Sponsor Funded Compensation

In the event that this research activity results in an injury, treatment will be available, including first aid, emergency treatment and follow-up care as needed. Care for such injuries will be billed in the ordinary manner, to you or your insurance company. The sponsor of the study has some funds available to pay for care for injuries resulting directly from being in this study. If you think that you have suffered a research related injury and that you may be eligible for reimbursement of some medical care costs, let the study physicians know right away.

Confidentiality

The records of this study will be kept private. In any publications or presentations, we will not include any information that will make it possible to identify you as a subject. Your record for the study may, however, be reviewed by *Jenna Golden* and by departments at the University with appropriate regulatory oversight.
.

Voluntary Nature of the Study

Participation in this study is voluntary. Your decision whether or not to participate in this study will not affect your current or future relations with Sheridan College or the

University of Minnesota. If you decide to participate, you are free to withdraw at any time without affecting those relationships.

Contacts and Questions

The researcher conducting this study is Ms. Jenna Golden. You may ask any questions you have now, or if you have questions later, you are encouraged to contact her at *jgolden@sheridan.edu, 808-333-7083*

To share feedback privately about your research experience, including any concerns about the study, call the Research Participants Advocate Line: 612-625-1650 or give feedback online at www.irb.umn.edu/report.html. You may also contact the Human Research Protection Program in writing at D528 Mayo, 420 Delaware St. Southeast, Minneapolis, MN 55455
You will be given a copy of this form to keep for your records.

Statement of Consent

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature of Subject_____

Date_____

Signature of Person Obtaining
Consent_____

Date_____

Appendix G-Consent Form (Control)

CONSENT FORM-control group

"The Functional Status and Oral Health Quality of Life for Seniors in Residential Facilities who Have Direct Access to Care Compared to Those Without Access"

You are invited to participate in a research study of assessing the oral health quality of life when receiving dental prevention services in your residential living facility. You were selected as a possible participant because you have more than six natural teeth and reside at either Greenhouse Living or Westview Health Care Center. We ask that you read this form or have it read to you and ask any questions you may have before agreeing to be in the study.

Jenna Golden, University of Minnesota, School of Dentistry, and Masters of Dental Hygiene student is the principal investigator and conducting this study.

Study Procedures

If you agree to participate in this study, we would ask you to do the following: Complete a survey that may take 5-10 minutes and receive oral hygiene care.

Confidentiality

The records of this study will be kept private. In any publications or presentations, we will not include any information that will make it possible to identify you as a subject. Your record for the study may, however, be reviewed by *Jenna Golden* and by departments at the University with appropriate regulatory oversight.
.

Voluntary Nature of the Study

Participation in this study is voluntary. Your decision whether or not to participate in this study will not affect your current or future relations with Sheridan College or the University of Minnesota. If you decide to participate, you are free to withdraw at any time without affecting those relationships.

Contacts and Questions

The researcher conducting this study is Ms. Jenna Golden. You may ask any questions you have now, or if you have questions later, you are encouraged to contact her at *jgolden@sheridan.edu, 808-333-7083*

To share feedback privately about your research experience, including any concerns about the study, call the Research Participants Advocate Line: 612-625-1650 or give feedback online at www.irb.umn.edu/report.html. You may also contact the Human Research Protection Program in writing at D528 Mayo, 420 Delaware St. Southeast, Minneapolis, MN 55455
You will be given a copy of this form to keep for your records.

You will be given a copy of this form to keep for your records.

Statement of Consent

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature of Subject_____

Date_____

Signature of Person Obtaining
Consent_____

Date_____