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DEVELOPING AN ORAL HEALTH REFERRAL SYSTEM

by

Lillian Bowen

A thesis

submitted in partial fulfillment

of the requirements for the degree of

Master of Science in the Department of Dental Hygiene

Idaho State University

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To the Graduate Faculty:

The members of the committee appointed to examine the thesis of Lillian Bowen find it satisfactory and recommend that it be accepted.

JoAnn Gurenlian, RDH, PhD
Co-Major Advisor

Denise M. Bowen, RDH, MS, Professor Emeritus
Co-Major Advisor

Elizabeth Fore, PhD
Graduate Faculty Representative

**IDAHO STATE UNIVERISTY
HUMAN SUBJECTS COMMITTEE
NOTICE OF ACTION**



Office for Research Integrity
921 South 8th Avenue, Stop 8046 • Pocatello, Idaho 83209-8046

April 22, 2014

Lillian Hillemann
Stop 8048
Pocatello, ID 83209

RE: Your application dated 4/21/2014 regarding study number 4085: Exploring Factors That May Impact on Oral Health Referral System

Dear Ms. Hillemann:

I have reviewed your request for expedited approval of the new study listed above. This is to confirm that I have approved your application.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

Submit progress reports on your project in six months. You should report how many subjects have participated in the project and verify that you are following the methods and procedures outlined in your approved protocol. Then, report to the Human Subjects Committee when your project has been completed. Reporting forms are available on-line.

You may conduct your study as described in your application effective immediately. The study is subject to renewal on or before 4/21/2015, unless closed before that date.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Thomas Bailey (208-282-2179; fax 208-282-4723; email: humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

DEDICATION

This thesis is dedicated to my family. They are the people in my life that I love the most. Everything I do, I do for you.

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

ADA: American Dental Association

ADHA: American Dental Hygienists' Association

CDC: The Centers for Disease Control and Prevention

FIW: Federal Interagency Workgroup

HRSA: Health Resources and Service Administration

IOM: Institute of Medicine

LCSC: Lewis-Clark State College

NHANES: National Health and Nutrition Examination Survey

NHIS: National Health Interview Survey

OHV: Oral Health Visit

SRCC: Snake River Community Clinic

USDHHS: United States Department of Health and Human Services

WHO: World Health Organization

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ABSTRACT

Purpose: This study explored factors that might impact the development and implementation of a referral system model for preventive oral healthcare.

Methods: Participants (N=36) attending an extraction-only safety net dental clinic participated in an interview administered survey regarding demographics, dental care history, and likelihood to follow up on referral for dental hygiene care. Referrals were made to a dental hygiene program for preventive oral care at no cost to the participants. Follow-up determined whether the participants made and attended preventive oral care appointments and the reasons for failure. Data were analyzed using descriptive statistics and the Fisher Exact tests.

Results: Using the Fisher's Exact test, no significant difference ($p>.05$) was found between responses to interview questions by the participants that followed through with scheduling an appointment (N=7, 19.4%) and those who did not (N=29, 80.6%)

Conclusions: More research is needed to determine how to effectively facilitate preventive oral care for underserved populations.

Chapter I: Introduction

Background

Many people do not utilize dental care for various reasons. The inability to pay for dental care is one of the top three reasons for not seeking dental care (Yarbrough, Nasseh, & Vujicic, 2014). Safety net dental clinics have been developed to treat dentally-underserved populations. Preventive oral health care is needed to reduce the cost, both financially and in time lost of missed school and work hours. If an appropriate referral system can be developed to refer dental safety net clinic patients for oral health screenings and preventive services delivered by dental hygiene schools, the guidelines could be employed to increase access to care for underserved populations being treated in safety net dental clinics.

Despite the importance of oral health, there are disparities in oral health and in accessing oral healthcare for some populations in America. These disparities are numerous and complex. Access to dental care may be affected by age, health, behavioral and social factors, language, and geographical factors (Edelstein, 2010). However, much of the dentally-underserved population is comprised of people with low incomes (Bailit, Beazoglou, Demby, McFarland, Robinson, & Weaver, 2006). Low income individuals whose earnings are below the poverty level receive about half the amount of dental care as higher earning populations (Edelstein, 2010). The United State of Health and Human Services (USHHS) defines the 2015 Federal Poverty Level as income at or below \$11,770 per a family of one (USHHS, 2015). In the year 2000, only 27.8% of people in low income population groups visited a dentist at least one time, compared to up to 53.5% of those in higher income groups. To eliminate this disparity of dental visits

between low income and high income populations, up to 33.3 million people in low income groups would have needed to visit a dentist at least one time during a year (Bailit, et al., 2006).

Dental safety net clinics provide services to underserved and vulnerable populations. These dental safety net clinics consist of Federally Qualified Health Centers, dental schools, mobile dental clinics, and public health departments (Edelstein, 2010). In Ohio, six retired dentists developed The Northwest Ohio Dental Safety Net Clinic. From its inception in 2004 until 2010, the clinic had treated 10,487 patients who probably would not have received care through regular private practice dental offices. An indicator of success for this clinic is the declining extraction rate, which may be an indication of the clinic's increasing ability to provide preventive and restorative services (Fallon, Schmalzried, Henry, Valasek, & Earlie-Royer, 2010). Other areas of the U.S. that developed safety net dental clinics over a decade ago to provide dental care for their unserved populations included but are not limited to: Manhattan, New Mexico, and North Carolina (Formicola, Ro, Marshall, Derkson, Powel, & Hartsock, 2004).

Oral disease is highly preventable. If individuals seek preventive oral healthcare, they can usually save money because they will be preventing more costly treatment that would be needed if the oral disease progresses (Moeller, Chen, & Manski, 2010).

Preventive care can be separated into three categories: primary, secondary, and tertiary. Primary oral preventive disease is defined as stopping oral disease before it starts. This level of preventive oral care is exemplified by the use of fluoride and dental sealants, and through patient education. Secondary preventive oral care involves early detection of oral disease, such as caries detection or oral cancer screenings. Tertiary oral preventive care

involves treatment of oral disease to reduce the impact of the oral disease of the individual (WHO, 1987).

A safety net dental clinic was established in Lewiston, Idaho in 2009. Lewiston, Idaho is designated as a Dental Health Professional Shortage Area because of the low income of its population. The United States Department of Health and Human Services (USDHHS) Health Resources and Service Administration (HRSA) (Data Warehouse Map Tool, 2012) has estimated that there are up to 40,351 dentally-underserved individuals within a fifty mile radius of Lewiston, Idaho. Of these individuals, 12,512 reside in Nez Perce County, where Lewiston is located.

Snake River Community Clinic (SRCC) is located in Lewiston, Idaho. It is a free medical clinic that serves the uninsured or underinsured low income people of the surrounding area. In 2009 providers began a dental safety net clinic. This clinic provides tooth extractions only. Recently, funding became available to help SRCC dental extraction patients receive additional care at the local community college dental hygiene clinic. The dental hygiene clinic located at Lewis-Clark State College (LCSC) and administered by Lane Community College, provides a full-mouth set of radiographs, a comprehensive dental examination by a licensed dentist, and an oral prophylaxis for the cost of \$55.00 per patient.

Currently, the only time a patient is referred from SRCC to the dental hygiene clinic is when the patient expresses a desire to receive preventive care or restorative dental care. This referral process only occurs if funds are available to pay for the extraction patient's first comprehensive visit, which includes radiographs, an examination, and an oral prophylaxis. At this time, there are no guidelines or criteria to

establish which dental safety net patients would benefit from being referred to the dental hygiene school located at LCSC for preventive care at no cost to them. With limited funding available, to pay for the reduced cost services at the dental hygiene clinic, referral criteria were needed to determine which patients would be candidates for this free referral for additional services.

The American Dental Association (ADA) recommends that referrals be made according to the professional judgment and experience of the treating dentist. The ADA also recommends that appropriate referrals take into consideration the desire of the patient (ADA, 2012). According to Zoitopoulos and Jenner (1999), only highly motivated people should be referred, as up to one-third of the patients who were referred from their community dental service to general dental practitioners did not attend their referred appointments.

The ADA discussed reasons that individuals do not attend dental appointments in the report *Why Adults Forgo Dental Care: Evidence from a New National Survey* (2014). The ADA reports that a survey of 4,014 adults showed that there are many reasons that the participants of the study did not attend dental appointments, but common factors included cost, not perceiving dental need, and lack of time.

Healthy People 2020 is a set of guidelines published by the Federal Interagency Workgroup (FIW) which includes: The USDHHS, The U.S. Department of Agriculture, The U.S. Department of Education, The U.S. Department of Housing and Urban Development, The U.S. Department of Justice, The U.S. Department of the Interior, The U.S. Department of Veteran's Affairs, and the Environmental Protection Agency. Healthy People 2020 builds upon information collected by Healthy People 1990, 2000,

and 2010 (USDHHS, 2012). The mission of this national agenda is to promote general health and to reduce preventable disease. One of the main goals of Healthy People 2020 is to achieve health equality, eliminate disparities, and to improve the health of all groups. With the development of a referral system that allows patients of Snake River Community Clinic to be referred to the hygiene school at LCSC, these goals potentially could be advanced through education, preventive dental care, and a reduction in disparities due to low income in this safety net clinic population.

Statement of Problem

Little is known or published about effective guidelines for referrals within the dental care delivery system, especially in relation to dental safety net clinics.

Purpose of Study

The purpose of this study was to explore factors that might impact the development and implementation of a referral system model for dental safety net patients to receive preventive dental hygiene care at a dental hygiene school.

Professional Significance of Study

The American Dental Hygienists' Association (ADHA) has developed a national Dental Hygiene Research Agenda. One of the priorities identified in this research agenda addressed by this study is to identify, describe, and explain mechanisms that promote access to oral healthcare, such as: financial, physical, and/or transportation. This project also addressed one of the main goals of Healthy People 2020, to achieve health equality, eliminate disparities, and improve the health of all groups (USDHHS, 2012). A model for referral of low income individuals from a safety net dental clinic, providing only extraction services, to a dental hygiene clinic, providing preventive oral health services,

was explored. No guidelines have been published to address this need; therefore, the results have the potential to guide similar programs throughout the U.S.

Research Questions

1. What factors should be included in a referral model for safety net patients to receive additional services at no cost through a cooperating clinic or agency based on the following data?
 - a. Criteria which should be considered in developing referral guidelines likely to foster compliance with scheduling and completing appointments.
 - b. Rate of compliance with scheduling and completing appointments.
2. What are the perceived barriers to accepting a referral to a cooperating clinic?
3. If a referral is accepted and no appointment was scheduled or attended, what were the barriers to scheduling and attending an appointment?

Definitions

Dentally-Underserved Population: A group of people unable to access dental care due to economic, cultural, or linguistic barriers (HRSA, 2012). In this study, the dentally-underserved population consists of low income people who are patients of Snake River Community Clinic.

Safety Net Dental Clinic: A dental clinic that is established to serve patient populations that have difficulty obtaining access to private practice dental offices (Edelstein, 2010). In this study, the safety net dental clinic is an extraction clinic only.

Dental Referral: A professional decision to send a dental patient to a different clinic/provider for additional care that cannot be administered at the original clinic or by the original provider. The referral may be written or verbal (ADA, 2007). In this study, a

dental referral will be given to participating patients at SRCC to the dental hygiene school located at LCSC.

Dental Hygiene School: An accredited learning school offering at least an associate's degree in dental hygiene. In this study, the dental hygiene school is administered by Lane Community College and located at LCSC in Lewiston, Idaho.

Rate of compliance: The degree to which a patient follows the advice of a healthcare professional (Zoitopoulos & Jenner, 1991). In this study, rate of compliance will be the number of individuals who are given a referral to the dental hygiene school located at LCSC, who attend their preventive care appointment.

Barriers to Oral Healthcare: Any circumstance that prevents individuals from receiving oral healthcare. This can be due to lack of understanding for the need of oral healthcare, lack of money, transportation, or child care, the inability to miss work, and fear or apprehension. In this study, barriers to oral healthcare will be explored.

Summary

There are many reasons why people do not receive oral healthcare. Many low income groups do not have the ability to pay for needed dental treatment. Safety net dental clinics have been developed to increase access to oral healthcare. A safety net dental clinic is in operation in Lewiston, Idaho. Currently, this clinic only provides tooth extractions for individuals seeking care. Funds from a grant are available to refer and pay for additional preventive oral healthcare provided by a local dental hygiene program. There are no criteria or guidelines concerning who should receive this benefit. If a referral system could be implemented to provide additional preventive oral healthcare to

individuals who receive care at this safety net dental service, goals for Healthy People 2020 and The National Dental Research Agenda may be better met.

Chapter II: Review of the Literature

Introduction

This literature review summarizes information regarding disparities in oral healthcare and how access to oral healthcare can influence the oral health status of the public; the differences between primary, secondary, and tertiary preventive oral healthcare, and the benefits of preventive dental hygiene care. It also provides information regarding factors to consider in a model for referral for preventive dental hygiene care, an overview of referral models and their impact and how safety net dental clinics can use referral systems to reduce disparities in oral health.

Databases searched included PubMed and EBSCO Host. Key terms searched in this literature review were: access, disparities, safety net dental clinics, and referral.

Access to Oral Health

The number of people who access oral healthcare in America is best defined as the number of individuals who have visited a dental office one or more times per year (Bailit, et al., 2006). There are several valid and reliable surveys designed to measure the number of people who see a dentist annually. Macek, Manski, Vargas, & Moeller (2002) concluded, in 2002, that the best estimates for these numbers came from the Medical Expenditure Panel Survey conducted by the Agency for Healthcare Research and Quality. These researchers compared three national surveys: The National Health Interview Survey (NHIS), The National Health and Nutrition Examination Survey (NHANES), both of which are conducted periodically by the Centers for Disease Control and Prevention (CDC); and the Health Expenditure Survey, which is administered by the Agency for Healthcare Research and Quality. Macek, et al. (2002) concluded that the

Health Expenditure Survey is more reliable than the other two national surveys because it relies on actual utilization data rather than on self-reported utilization data, because self-reported data cannot be confirmed. Data from the 2013 National Survey indicated that dental health expenditures have increased 0.9% in 2013. In 2013 out of pocket dental spending, which accounts for 42% of all spending, increased 1.7%, while private health insurance spending, which accounts for 47% of all spending, declined 0.6%.

Although the Health Expenditure Survey was the most reliable of the three surveys examined in the comparative analysis conducted by Macek, et al. in 2002, all of the surveys indicated that access to oral healthcare is most problematic for low income populations. All three surveys documented the fact that people with low incomes do not visit a dentist as often as individuals with higher incomes. The U. S. Department of Health and Human Services (USDHHS) (2015) Poverty Guidelines define poverty as an income at or below \$11,770 for a family of one. Low income populations were described by Bailit, et al. (2006) as individuals with income levels at twice the federal poverty level. In 2006, approximately 27.8% of low income people visited the dentist at least once a year, compared to 40.4% of middle income individuals, and 53.5% of high income individuals (Bailit, et al., 2006). In order to reduce this disparity in dental care, the percentage of people in low income groups who saw a dentist at least once during the year would need to increase to 40.4%. This increase translates into 10.4 million more low income people seeking dental care during the year. This estimate may be quite low, as low income populations have more oral problems than their higher income counterparts (Bailit, et al., 2006).

In a Kaiser Report titled, *Dental Crisis in America* (Sanders, 2012), it was noted that low income groups are more likely to have more dental problems than their more affluent counterparts. This report provided statistics describing the oral health disparities in the United States. For example, 17 million children from low income households go without basic dental care and experience more toothaches than their wealthier peers. Furthermore, in Vermont alone, 62,000 adults aged 18-64 years did not seek dental care because they could not afford it. Other barriers to utilization of dental care services that were listed in this report included: “language, cultural barriers, transportation challenges, and difficulty finding work and childcare arrangements” (Sanders, 2012). Emphasis was also given to the fact that people are often faced with the difficult decision to have teeth extracted because it is more affordable than having expensive dental treatments, and that extraction can lead to negative health and social impacts (Sanders, 2012).

The CDC and The Institute of Medicine (IOM) also have recognized disparities in oral healthcare due to low income. In a report for the CDC by Dye, Li, & Thorton-Evans (2012), it was noted that children from low income families received less dental sealants and had up to 26% more untreated dental caries than their more affluent peers. Low income adults also suffer more dental problems than adults who live above the poverty level. Complete tooth loss is twice as high for individuals below the poverty level as for those who live above it. The IOM report *Improving Access to Oral Healthcare for Vulnerable and Underserved Populations* confirmed these findings. The IOM reported that, in 2008, 4.6 million children went without dental care because their families could not afford it, and the IOM also listed low income populations among those more vulnerable to oral healthcare disparities (IOM, 2011).

In another study conducted by the American Dental Association's Health Policy Institute, cost and not needing dental care are the top two reasons for not seeking dental care. A Harris Poll was conducted on behalf of the American Dental Association (ADA). This poll surveyed 4,014 adults aged 18 or older on "health insurance status, oral health status, and dental care seeking behavior" (Yarbrough, Nasseh, & Vujicic, 2014). Low income adults with no dental insurance were the least likely to remark that they would not seek dental care within the next year. Forty percent of the adults polled cited cost as the biggest deterrent to seeking dental care (Yarbrough, et al., 2014).

When people have access to dental care, their oral health improves. This association has been illustrated numerous times. In one of the largest studies of its kind, conducted by York, Poindexter, and Chisik (1995) nearly 20 years ago, the oral health of military personnel was assessed. In the military, yearly dental care is often mandatory, and it is usually provided without a fee. This study examined the oral health of 13, 050 military personnel. Edentulism was not found, and military personnel also had less decayed, and fewer missing and filled teeth than their non-military counterparts (York, Poindexter, & Chisik, 1995). In a study conducted by The Swedish National Institute of Public Health, it was found that the inability to pay for dental services led to less utilization of dental services and an increase in dental problems. The study population included 73,330 people from the ages of 16-84, but only data from individuals over 21 years of age were included, because children and young adults receive free dental care in Sweden. The Swedish National Institute of Public Health mailed a self-administered questionnaire to a random sample of 73,330 people. The individuals who received the questionnaire were asked to rate their oral health on a scale from very good to very poor.

The individuals were also asked if they had any loose teeth. This question was asked to determine if the questionnaire respondents had periodontal disease. The respondents were asked when they last had a dental visit and if they sought dental care regularly. Questions regarding their financial circumstances and occupational status were asked. The survey takers were also asked their age, education levels, and lifestyle habits, which included tobacco use, diet, alcohol use, and physical activity. Also, 47% of men and 42% of women who rated their oral health as poor also had symptoms of periodontal disease. The populations that were categorized as having socioeconomic disadvantage, lower education, or being unemployed had higher levels of poor oral health and periodontal disease. Final analysis of this survey suggested that socioeconomic factors caused over 60% of dental problems, due to lack of access to dental care. The authors concluded that “lack of access to dental care services in itself has more negative consequences on oral health than socioeconomic disadvantage” (Wamala, Merlo, Bostrom, 2006).

Preventive Oral Healthcare

This section of the literature review will discuss the differences in primary, secondary, and tertiary oral healthcare, the benefits of preventive oral healthcare, and factors to consider in a preventive oral healthcare model.

Dental disease is a mostly preventable disease and, unlike other diseases or illness, dental disease usually does not improve without professional intervention. There are different levels of oral care. Primary oral care is care that is preventive in nature and provided to avoid the development of disease. Primary preventive oral care can be illustrated by the use of fluoride products, or through education to prevent oral disease. Secondary oral care involves early disease detection. Examples of secondary oral

healthcare include periodontal screenings or dental caries screenings. Tertiary oral healthcare is used to reduce the impact of disease that is already present, and to improve the quality of life for the people who are affected by the oral disease. In oral healthcare, this level of prevention can be seen in the restoration of carious teeth and replacement of missing teeth by implant, bridge, or denture (World Health Organization, 1987).

Most oral diseases are preventable; therefore, prevention of dental problems may be more cost effective than treating dental disease (CDC, 2012). Economic evaluation is an important factor for consideration when disease prevention is involved (Morgan, Marino, Bailey, & Hopcraft, 2012). Economic evaluation is often used by individuals or groups to make decisions about public health policy. The decision makers must weigh the most viable options for healthcare. The outcome and cost for a healthcare initiative must be examined and the cost is considered in making a decision about what the most advantageous intervention program will be (Morgan, et al., 2012). The CDC (2012) reported that when dental care is delayed for children, medical care from emergency rooms is usually sought when the dental problem worsens. The CDC estimated that if a child received oral preventive care, a three year average of the cost for that care would be about \$660. The three year cost for an emergency room treatment would amount to \$6,498. That cost represents almost ten times more expense for treatment of dental disease. Not only is this cost much greater, it often does not solve the dental problem, but only provides a temporary solution (CDC, 2012).

The ADA also summarized the cost of emergency room treatment in their report: *Breaking Down Barriers to Oral Health for All Americans*. The ADA noted that the total cost for an emergency room treatment for an abscessed tooth would be approximately \$

236, and would result in palliative care through the use of antibiotics and pain medication. The dental problem is not solved and is likely to recur, causing additional visits to the emergency room. The total cost for having the tooth extracted in 2013 at a dental office would average \$156. The problem would be solved and no other treatment would be necessary (ADA, 2011). In comparison, another survey conducted by Delta Dental Plan reported that in the years 2008-2010, the average cost for an emergency room visit for dental problems was \$209 for uninsured individuals (Rosaen & Horowitz, 2014). These findings are similar in comparison to the ADA's findings.

The difference in cost between primary preventive dental care and secondary or tertiary care was also found in a study by The Agency for Healthcare Research and Quality comparing treatment received by Medicare beneficiaries. The authors examined the Medicare Current Beneficiary Survey. This survey is the "only comprehensive source of information on the healthcare status, healthcare use, health insurance coverage, and socioeconomic and demographic characteristics of the entire spectrum of Medicare beneficiaries" (Moeller, Chen, & Manski, 2010). A total of 10,582 individuals were interviewed three times a year over a four-year period. These individuals were separated into two groups: those who had used preventive dental care within a one-year period, which included oral prophylaxis, dental radiographs, and a dental exam, and those who had used only non-preventive dental care services (i.e. visited a dental office for non-elective procedures, such as restorations, crowns, and root canals). The group that visited the dental office for non-preventive services also included individuals who visited the dental office for an exam or radiographs, but only when there was not an oral prophylaxis included in the dental visit. When the Medicare beneficiaries accessed preventive care,

they visited the dentist more often overall, but more of these visits were less expensive than those for beneficiaries who did not receive preventive care. This difference resulted in a savings of approximately \$260 per person per year for attendees who received preventive dental care. The researchers concluded that “coverage for preventive dental care could pay off in terms of both improving the oral health of the Medicare population and limiting the cost of expensive non-preventive dental care” (Moeller, et al. 2010, p. 2268).

The economic ramifications of preventive dental care can also be measured in hours of work lost due to dental problems. *Oral Health in America: A Report of the Surgeon General* reported in 1989 that 164 million work hours were lost due to dental disease. The economic impact of dental disease is not the only concern of prevention of dental disease; dental disease is also the leading cause of absence in school children. Children lose up to 51 million hours of school per year due to dental problems. Since dental disease is more prevalent in low-income families, dental disease and loss of school time may perpetuate future disparities. Because of the cost savings with primary prevention and the economic impact of lost working and school hours, it follows logically that primary prevention of oral disease is more desirable than secondary or tertiary dental treatment of disease.

One of the factors to consider in a preventive oral healthcare model included changing the focus of disease management to disease prevention and health management (Polverini, 2012). According to the National Public Health Partnership (2006), prevention is the “action to reduce or eliminate or reduce the onset, causes, or complications or recurrence of disease.” Prevention is often less relevant when it comes to other health

problems, but dental diseases are highly preventable. A focus on prevention is a main goal for the public healthcare system, and an important part of public policy.

Another factor is the readiness of future dental professionals to practice disease prevention. Academic dentistry must train dental students to assess and understand the risks of oral disease, and prepare future graduates to become leaders who will advance the new preventive oral healthcare model. The future healthcare model will focus on the need to reduce costs, become more efficient, and better the care provided to patients, especially those suffering from chronic disease. Dental professionals will be expected to achieve these goals by using the latest technologies to detect the risk of disease and to develop a personalized healthcare plan for each patient (Polverini, 2012).

Patient utilization of oral healthcare is also a factor to consider when creating a preventive healthcare model. According to data from the NHIS, there was a steady rise in utilization rates among children from 1997-2010, possibly due to the rise in public healthcare benefits available. In the same span of years, there was a steady decrease in utilization rates among non-elderly adults. The authors of this study reported that this may be due to the fact that children have access to Medicaid and CHIP programs, but dental services for adults are not a benefit for non-elderly adults who receive Medicaid benefits (Wall, Vjicic, & Nasseh, 2012). In another study conducted by the ADA, participants cited cost and no perceived need for dental services as reasons for not making or attending dental appointments (Yarbrough, Nasseh, & Vujicic, 2014).

The USDHHS also recognized the importance of oral health prevention. The USDHHS had developed a 10-year agenda for improving the health of all Americans titled: *Healthy People 2020*. Healthy People 2020 is an evidenced based initiative that

calls for the promotion of prevention and treatment options to better the health of individuals at the local, state, and national levels. Healthy People 2020 has developed evidence based oral health objectives in prevention that include “increasing the awareness of the importance of oral health, increasing acceptance and adoption of effective preventive interventions, and reducing disparities in access to effective preventive and dental treatment services” (Healthy People 2020, 2010). Healthy People 2020 recognized that some of the barriers that need to be overcome are access difficulties, increasing awareness of a need for dental care, cost of dental treatment, and fear of dental treatment.

Healthy People 2020 has devised a set of objectives for adult oral health. These objectives include reducing the rate of adults aged 35-44 with untreated dental decay. Reducing the number of adults aged 45-64 who have had a permanent tooth extracted because of poor oral health is also an objective, as is reducing the number of adults aged 65-74 who have lost all of their teeth, and reducing the number of adults aged 45-74 with periodontal disease. The goal of Healthy People 2020 is to reduce the percentages of each category by 10% (USDHHS, 2010).

Healthy People 2020 emphasized that prevention is the key component to healthier lives for all Americans. USDHHS had designed a National Prevention Strategy that has set goals and priorities to promote health and wellness through prevention, to ensure that prevention-focused healthcare is available, and to eliminate disparities (USDHHS, 2010).

Almost everyone suffers from oral disease at some time in their life, but most oral disease conditions do not resolve without the care of a health professional. Prevention of

oral disease is more cost effective than treating existing or future disease, and can save money in terms of hours of work lost due to tooth or mouth pain. A preventive oral healthcare model needs to address the prevention of oral health disease, dental education, and increasing the rate of utilization of dental care, especially for low-income individuals.

Preventive Efforts to Reduce Disparities

This section of the literature review discusses oral healthcare referral systems, the purpose and outcomes of the dental safety net, and the use of dental hygiene schools to reduce disparities to a socially acceptable level.

Information pertaining to oral healthcare referral systems and referred patient compliance is limited. As stated in chapter one, up to one-third of referred patients will miss their scheduled appointments (Zoitopoulous & Jenner, 1991). Considering this figure, it is necessary to formulate criteria to reduce the number of missed appointments when referring patients from a safety net dental clinic.

In the United Kingdom, research was conducted to identify characteristics of elderly people who accepted a referral for an oral health visit. In a randomized control trial, three general medical offices referred patients over the age of 75 to an Oral Health Visit (OHV), unless the older patient was assigned to a control group, where no referral was given. Both groups included 685 participants, with a mean age of 82. The individuals were asked if they wanted to be referred for an OHV. A total of 172 (92%) of all individuals who wanted a referral actually attended the OHV. Of these individuals, it was found the leading indicators for attendance to the OHV included having current oral problems or pain and not having a regular dentist (Lowe, Blinkhorn, Worthington, & Craven, 2007).

Specific criteria for referring patients from a dental safety net clinic, for additional oral healthcare services, have not been established. A search of the U.S. Department of Health and Human Services National Guideline Clearinghouse provided no guidelines pertaining to dental or oral health referrals. However, the ADA has general guidelines to follow when referring dental patients to other general practitioners or dental specialists. Referrals should always be given on the referring dentist's professional judgment, with the best interest of the patient in mind. The patient should always be educated about the reasons for any referrals, and they should always be included in any treatment decisions. Any patient apprehension can be eased through discussion and questions with their primary dental practitioner when unfamiliar treatment and providers could become involved in the patient's oral healthcare (ADA, 2007).

The dental safety net is often a last resort for low-income families, but could be the first step in educating patients and guiding their actions toward preventive care. The safety net is defined as "dental care providers with a specific interest in providing or mission to provide dental care to low income and other underserved populations" (Byck, Cooksey, & Russinoff, 2005). Dental safety net clinics treat low income individuals that do not have a regular dentist and do not turn away individuals with dental pain that cannot afford care in private practice offices (National Maternal Resource Center, 2015). These clinics are usually located in areas of low-income populations and serve those who have difficulty accessing and paying for dental services. Safety net clinics are most commonly operated and managed by community health departments, dental and dental hygiene schools, and other non-profit organizations (Byck, et al., 2005).

In a study of the Medical Expenditure Panel Survey by AHRQ, Bailit, et al. (2006) analyzed the outcomes of the dental safety net, and utilization rates of poor, near poor, and low-income families. It was found that the underserved population included about 82 million people when the survey was conducted. Only 27.8% of this population had an appointment with a dentist at least once during the past year. To reduce disparities to a socially acceptable level, 33.3 million people would need to visit a dentist one or more times per year, even though the current safety net can only handle seven to eight million patients per year. The safety net capacity could grow by as much as 25% if certain expansion strategies were implemented; however, even if the safety net were expanded, the underserved would still need to seek care from private practice dentists to reduce disparities (Bailit, et al. 2006).

As previously stated, focusing on primary prevention of oral disease is more cost-effective than treating existing oral conditions. If both healthcare providers and patients were to change their focus to prevention, disparities would be reduced due to the increased accessibility of oral care for low-income families.

The dental hygienist is the oral healthcare team member who is focused on providing preventive oral healthcare services. Dental hygienists diagnose and treat oral disease at early stages (ADHA, 2012). Responsibilities of the dental hygienist include, in part, educating patients and evaluating self-care progress, identifying what keeps patients from self-care, and creating a personalized plans to guide patient self-care. This self-care education helps to develop attitudes and behaviors conducive to good oral health (Notgarnie, 2012).

The Dental Hygiene Professional Practice Index was developed by The National Center for Health Workforce Analysis to document what type of impact the dental hygiene workforce had on oral healthcare access for underserved populations. The results suggest that access to oral healthcare, utilization of dental services, and overall oral health of underserved populations could be improved by broadening the practice of the dental hygiene profession. The preventive services provided by dental hygienists are more accessible due to the reduced cost of care and the alternative settings in which hygienists can work (ADHA, 2012).

In a report by The National Governor's Association (2014), it is advised that dental hygienists assume an even bigger role in caring for underserved populations. The report points to the fact that there are not enough equally disbursed dentists to care for this population. If dental hygienists are allowed to expand their scope of practice, underserved populations could potentially receive safe, effective dental preventive care (Dunker, Krofah, & Isasi, 2014). Another report, *Dental Crisis in America* mirrors these suggestions. This report promotes laws that would allow dental hygienists to practice without supervision in high need nontraditional settings (Sanders, 2012).

If the use of dental hygiene services can, indeed, reduce oral healthcare disparities, then underserved populations could potentially benefit from preventive services provided at a dental hygiene school. According to the ADA's 2013 Survey of Dental Fees Report, the average cost for an oral prophylaxis was \$85.38, a full mouth series of radiographs was \$141.93, a comprehensive oral examination was \$85.64, and oral hygiene education was \$24.07 in the Pacific U.S. Census Division (ADA, 2013). LCSC's dental hygiene clinic offers an adult prophylaxis, full mouth series of

radiographs, and a comprehensive oral examination for \$55.00, a fraction of the ADA's prophylaxis cost average. The low cost of dental hygiene preventive services, when provided by a dental hygiene student, has the potential to increase the accessibility for low-income patients who would not be able to afford dental services otherwise.

Summary

There are many people who do not receive preventive dental services in the United States. The inability to pay for dental services is the leading cause of not receiving dental care. People who receive dental care usually have better oral health than people who do not utilize dental care. Most dental disease is preventable and preventive dental care interventions can reduce or eliminate the need for more expensive dental treatments. To help reduce oral health disparities, the cost of oral healthcare needs to be reduced, and referral systems criteria should be developed. Safety net dental clinics have been established to help low income populations receive dental care. If safety net dental clinics could refer patients to dental hygiene schools for preventive treatment and education, access to dental care may possibly be increased for low-income populations. Therefore, the purpose of this study was to explore the development of a referral system from an extraction only dental safety net clinic to a dental hygiene school.

Chapter III: Methodology

Overview of Study

This study utilized interview-administered surveys to explore factors impacting the development of a safety net dental clinic referral system for preventive care oral healthcare provided by a dental hygiene school. This study addressed the following research questions:

1. What factors should be included in a referral model for safety net patients to receive additional services at no cost through a cooperating clinic or agency based on the following data?
 - a. Criteria which should be considered in developing referral guidelines likely to foster compliance with scheduling and completing appointments.
 - b. Rate of compliance with scheduling and completing appointments.
2. What are the perceived barriers to accepting a referral to a cooperating clinic?
3. If a referral is accepted and no appointment was scheduled or attended, what were the barriers to scheduling?

Design

This exploratory study used interview-administered surveys of patients at SRCC. Exploratory research was appropriate because the problem of providing preventive services to individuals who do not have access to dental care has not been clearly defined, as yet. In fact, the real scope of the problem of patients' acceptance and follow through with referrals for oral healthcare is unclear. Information obtained will help to define the problem, and perhaps generate hypotheses to be tested in the future.

Research Context

This study was conducted beginning in March, 2014 and closed when there were 30 or more participants enrolled at SRCC in Lewiston, Idaho. SRCC has been an extraction only safety net clinic that has been in operation for three years that provides medical care for uninsured people experiencing dental pain. SRCC is open for medical care Tuesday and Thursday evenings, with the extraction clinic operating four nights per month. People interested in receiving medical care must go to the clinic at two o'clock p.m. on the day of operation to reserve an appointment for after six o'clock p.m. that evening. On the patient's first visit, a radiograph is taken of the affected area, and the patient is scheduled for a subsequent visit for a dental extraction. A letter of agreement to serve as the site for this study and to provide support for patient recruitment has been provided by the director of SRCC (Appendix A).

Lane Community College administers the dental hygiene program located at LCSC. The LCSC dental hygiene clinic provides dental hygiene services Monday through Friday from eight o'clock a.m. to five o'clock p.m. Services include dental radiographs, dental examinations, oral prophylaxis, oral health education, and limited restorative procedures. These two locations were chosen due to their accessibility to the Principal Investigator (PI) and to the general public. A letter from the director of the dental hygiene program agreeing to provide screenings for all participants referred to the clinic and to provide oral preventive care to those participants who meet the students' learning needs has been obtained (Appendix B).

Research Subjects

Sample description. The convenience sample for this study included all safety net dental patients who had appointments between March and October, 2014, and who agreed to participate. These participants were 18 years of age and capable of signing an informed consent. There were no exclusion criterion.

Human subject protection. The study protocol was submitted to the Idaho State University Human Subjects Committee for expedited review and approved on April 22, 2014 (#4085). Each participant was taken into a secluded conference room where the PI reviewed the study and verbally explained the consent form. The participants were asked to sign an informed consent form (Appendix C).

Data Collection

Instruments. Data collection instruments used in this study included two self-designed, interview-administered surveys. The dental hygienist PI conducted the initial interview immediately after the participant agreed to participate in the study. The interview-administered survey form (Appendix D) was used to record participant's responses to a series of questions regarding demographics and willingness to accept a referral, and to make and attend a dental hygiene appointment at LCSC. The second instrument was an interview-administered survey form outlining questions asked during a telephone call made by the PI to any participant who failed to make a screening appointment at the dental hygiene clinic (Appendix E). This instrument was used to record the participants' reason(s) for failure to make an appointment for a dental screening.

Reliability and Validity

The self-designed instruments being used in this study were sent to a panel of five experts with experience in treating safety net dental patients or publications regarding access to care for the economically disadvantaged to determine if the interview questions had face validity, using a content validity index. Only items that were rated strongly relevant were included in the interview questions (Appendix F). The instruments were revised as needed based upon the outcomes of the expert review. Reliability was not determined for this study because the study was exploratory in nature.

Procedures and Protocols

The PI verbally conducted all interviews and used the data collection forms to record responses. Once a patient at the SRCC safety net clinic expressed interest in the study an informed consent was obtained, the PI immediately began the initial interview by asking the participant a series of questions utilizing the first instrument. If the participant was willing to be referred to the dental hygiene program for free oral preventive care, the participant was given a pamphlet with information on how to contact the dental hygiene clinic for scheduling and what to expect during the initial dental hygiene appointment (Appendix G). The participant was informed that, for the purpose of the study, the participant must make contact with the dental hygiene school within two weeks.

The PI directly contacted the participants to ascertain if an appointment had been made. If the participant did not schedule an oral preventive care appointment within the allotted two week time frame, the PI asked a series of questions from instrument number

two, noting all responses on the data collection form. The participants were assessed by dental hygiene students for an initial screening appointment. At that time, the dental hygiene student scheduled the patient for a subsequent appointment at the dental hygiene program's clinic for preventive oral care.

Limitations

The limitations of this study were the non-randomized sample and the small sample size. Because the sample of this population was a non-randomized volunteer sample and the sample size included 30 participants, findings of this study cannot be generalized to all populations seeking care within a safety net setting. However, the exploratory nature of this study provided insights regarding future research on referrals for patients seeking care at safety net clinics that do not provide preventive oral healthcare as well as regarding barriers to accessing care at other settings for populations that receive limited care in dental safety net settings.

Statistical Analysis

Descriptive statistics were used to summarize demographics of the study's participants and categorical (nominal or discrete) data generated from semi structured response interview items. The descriptive data analyses included mean, standard deviations, ranges, and percentages. Descriptive statistics and percentages were used to summarize demographics of the study's participants and the categorical data generated from interview-administered survey items. The descriptive data analyses included means and standard deviations to summarize demographic information about the sample and percentages of responses to each interview item. The Fisher's Exact test was used to determine if there were any statistically significant differences in the categorical

responses of the participants that followed through with making and attending an appointment for preventive oral health care and those that did not.

Summary

A series of two interview-administered surveys were developed to explore the development and implementation of a referral model from a safety net dental clinic to a dental hygiene school for preventive oral care. These interviews were used to explore the characteristics of a sample that made and attended a dental hygiene preventive appointment and those that refused the services, perceived barriers to accepting a referral, and perceived barriers to making and attending a dental hygiene appointment. While the sample of the population being studied was voluntary and small in nature, this exploratory study may provide a platform for further studies in reducing barriers for additional dental care for populations that receive limited care at safety net dental clinics.

Results, discussions, and conclusions will be reported in the form of a manuscript to be submitted for publication in *The Journal of Dental Hygiene*. The author guidelines for this journal are contained in Appendix H.

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Appendix A: Letter of Support from SRCC



Snake River Community Clinic
215 Tenth Street, Lewiston, ID 83501
(208) 743-5899 (phone/fax)
www.srcc-freeclinic.org

January 15, 2014

To Whom It May Concern:

Please be advised that Lillian Hillemann-Bowen is conducting dental care research at our clinic. This research is highly supported by our board of directors, volunteer dental care providers, and our clinic's Director.

We hope that this research will provide important information that can lead to better dental care for low-income persons.

If you have any questions, please feel free to contact me at the above address or phone number.

Sincerely,

A handwritten signature in blue ink, appearing to read "Charlotte M. Ash".

Charlotte M. Ash, Director
Snake River Community Clinic

Appendix B: Letter of Support from Lane Community College

Lane Community College Dental Hygiene

Lewis-Clark State College

500 8th Ave

Lewiston, Idaho 83501

January 24, 2014

To Whom It May Concern:

As a community partner providing dental services to low-income dental clients, Lewis-Clark State College dental hygiene clinic will be working to support Lillian Hillemann in her research to develop, implement and evaluate a referral system model for Snake River Community Clinic.

By providing support for this research with our 6 unit dental hygiene clinic and dental hygiene students, this project will not only be beneficial to our students educational process, but the citizens of the Lewiston-Clarkston community as well. As the clinic director and lead instructor I am happy to be a part of Lillian's research.

I am available for further questions or information at 208-792-2932.

Sincerely,

Vonda R Mulrony RDH, BS

Associate Professor of Dental Hygiene

Appendix C: Consent Form

Consent Form

Developing, Implementing, and Evaluating an Oral Health Referral System

We are asking you to be in a research study.

You do not have to be in this study.

If you say yes, you may quit the study at any time.

Please take as much time as you want to make your choice.

Why is this study being done?

To learn more about sending people to the Dental Hygiene Clinic at Lewis Clark State College.

We are asking people like you who are patients of Snake River Community Clinic to help us.

What happens if I say yes, I want to be in the study?

If you say yes, we will:

Ask you a few questions about going to the dental hygiene clinic

Give you information on how to contact the dental hygiene clinic and what will happen at the clinic

Pay for your care at the clinic

Contact the clinic to see if you made and kept your appointment

Call you if you do not make or keep your appointment

How long will the study take?

It depends on how quickly you contact the dental hygiene clinic and how soon they can schedule an appointment for you. The study will completely end at the end of June, 2014.

Where will the study take place?

The dental hygiene clinic is located at Lewis Clark State College in the Wittman Building at 526 11th St. in Lewiston, Idaho. There is free parking next to the clinic. You will need to provide your own transportation to and from the clinic.

What happens if I say no, I do not want to be in the study?

No one will treat you any differently. You will not be penalized. While you would not get the benefit of being in this study, you would not lose any other benefits.

What happens if I say yes, but change my mind later?

You may stop being in the study at any time. You will not be penalized. Your relationship with Snake River Community Clinic or Lewis Clark State College will not change.

Who will see my interview answers or dental hygiene clinic information?

The only people who will see your interview answers and dental hygiene information will be the people who work on the study and those legally required to supervise our study.

Your interview answers and a copy of this document will be locked in a file in the Dental Hygiene Department at Idaho State University.

When we share the results of our study in professional journals, we will not include your name.

Will it cost me anything to be in the study?

NO

Will being in this study help me in any way?

Yes, you will receive free preventive dental hygiene care. This will include dental x-rays, a dental examination, and an oral cleaning and a home care kit.

Will I be paid for my time?

NO

Is there any way being in this study could be bad for me?

Yes, there is a chance that:

You may require a dental extraction if you have not attended and completed treatment at the dental hygiene clinic.

What if I have questions?

Please call the head of the study [insert name and phone number] if you:

Have questions about the study.

Have questions about your rights.

Feel you have been injured in any way by being in this study.

You can also call the Idaho State University Human Subjects Committee office at 208-282-2179 to ask questions about your rights as a research subject.

Do I have to sign this document?

No. You only sign this document if you want to be in the study.

What should I do if I want to be in the study?

You sign this document. We will give you a copy of this document to keep.

By signing this document you are saying:

You agree to be in the study.

We talked with you about the information in this document and answered all your questions.

Your Name (please print)

Appendix D: Initial Interview Instrument

Initial Interview Schedule

Participant's Name: _____

Participant's Age: _____

Participant's Sex: _____M _____F

Questions Principal Investigator Will Ask Potential Study Participants:

1. What is your ethnic background
 - a. White
 - b. Black
 - c. Asian
 - d. Latino
 - e. Native American
 - f. Other: Please specify
2. Do you have a regular dentist that you are able to see currently?
 - a. Yes
 - b. No
1. Have you ever had regular dental care-and regular means-visited a dentist for a check-up or examination one or 2 times a year?

- a. Yes
 - b. No
2. When was the last time you went to a dentist for a check-up or examination?
- a. Less than 6 months
 - b. 6-11 months
 - c. 1 to 3 years
 - d. More than 3 years to 5 years
 - e. More than 5 years to 10 years
 - f. More than 10 years
 - g. I have never had a dental check up
3. Are you experiencing dental pain?
- a. Yes
 - b. No
4. Do you have a regular dentist that you are able to see currently?
- a. Yes
 - b. No
- 5.a. If no, what is your dental concern?
- a. I haven't been to a dentist for a period of time and wondered if my mouth was in good health.
 - b. I have a tooth that looks bad
5. b. If yes, would you describe the location of your pain as:
- a. From one tooth
 - b. From more than one tooth

5.c. Would you describe it as

a. Constant? OR

b. Intermittent?

6. Are you interested in receiving dental preventive care that would include dental radiographs (x-rays), a dental examination, and an oral prophylaxis (cleaning), and oral health education?

a. Yes

b. No

6.a Would it influence your decision if the preventive dental care was going to be provided by dental hygiene students, under the supervision of licensed dentists and dental hygienists at no cost to you?

a. Yes, (follow up question 7.)

b. No, it would not influence my decision

6b. What would influence your initial decision?

Student clinicians are not desirable to me, so I would no longer be interested

Other (specify)_____

7. Follow up for those who are interested: (Skip to 8 if not interested)

7a. On a scale of 1-5 how likely are you to make an appointment for yourself?

Very Likely

Somewhat Likely

Neither Likely or Unlikely

Somewhat Unlikely

Very Unlikely

7b. On a scale of 1-5 how likely are you to keep that appointment?

Very Likely

Somewhat Likely

Neither Likely or Unlikely

Somewhat Unlikely

Very Unlikely

7c. For those likely: (If not likely, skip to question 8)

What would facilitate your ability to make and keep an appointment?

8. For those not interested or unlikely:

What are the barriers that would keep you from seeking free preventive dental care at this time?

- a. No desire
- b. No perceived need for dental care
- c. Lack of transportation
- d. No child care
- e. Time missed from work
- f. Fear of dental care
- g. Health issues prevent attending appointments

Other,

specify_____

Appendix E: Failure to Schedule Instrument

Instrument #2

Failure to Schedule Appointment

To be completed by phone interview by PI to participant

Participant's Name _____

Date of Initial visit at SRCC _____

Date of Telephone Interview _____

1. Can you tell me why you did not make an appointment at the dental hygiene clinic:
 - a. I forgot
 - b. I have been too busy
 - c. I was nervous or afraid of making an appointment
 - d. I changed my mind
 - e. Other, please specify
2. Participant did not answer telephone
 - a. Left message
 - b. No message system available
 - c. Non-working telephone number
 - d. Sent text message

Appendix F: Expert Review Form of Research Instruments

As an expert in safety net dental clinics, referrals, and/or dental hygiene schools, please review the following four interview instruments for content validity. Check 1=not relevant, 2=somewhat relevant, 3=quite relevant, 4=very relevant. This will represent your assessment of the question's validity. In addition, please feel free to make comments or recommendations in the space provided. Thank you for your time and contribution.

Initial Interview Schedule

Participant's Name _____

Participant's Age _____

Participant's Sex ____ M ____ F

Not Relevant __, Somewhat Relevant __, Quite Relevant __, Very Relevant __

Comments/Recommendations _____

Questions Principal Investigator Will Ask Potential Study Participants:

1. What is your ethnic background:

White

Black

Asian

Latino

Native American

Other: please specify _____

Not Relevant __, Somewhat Relevant __, Quite Relevant __, Very Relevant __

Comments/Recommendations _____

2. Do you have a regular dentist that you are able to see right now?

Yes

No

Not Relevant __, Somewhat Relevant __, Quite Relevant __, Very Relevant __

Comments/Recommendations _____

3. Have you ever had regular dental care- visited a dentist for a check-up or examination 1 or 2 times a year?

Yes

No

Not Relevant__, **Somewhat Relevant**__, **Quite Relevant**__, **Very Relevant**__

Comments/Recommendations_____

When was the last time you went to a dentist for a check-up or examination?

Less than 6 months

From 6 months to one year

1 to 3 years

3 to 5 years

5 to 10 years

More than 10 years

I have never had a dental check-up.

Not Relevant__, **Somewhat Relevant**__, **Quite Relevant**__, **Very Relevant**__

Comments/Recommendations_____

Are you currently experiencing dental pain?

Yes

No

4a. If no, what is your dental concern?_____

4b. If yes, how would you describe your pain?

From one tooth?

From more than one tooth?

Constant

Intermittent

Not Relevant__, **Somewhat Relevant**__, **Quite Relevant**__, **Very Relevant**__

Comments/Recommendations_____

Are you interested in receiving dental preventive care that would include dental radiographs (x-rays), a dental examination, an oral prophylaxis (cleaning), and oral health education?

Yes

No

Not Relevant__, **Somewhat Relevant**__, **Quite Relevant**__, **Very Relevant**__

Comments/Recommendations_____

Would you be more interested in receiving dental preventive care if it were free?

Yes

No.

Not Relevant__, **Somewhat Relevant**__, **Quite Relevant**__, **Very Relevant**__

Comments/Recommendations_____

If yes:

On a scale of 1-5 how likely are you to make an appointment for yourself?

Very Likely. 2. Somewhat Likely. 3. Neither Likely or Unlikely. 4. Somewhat Unlikely

5. Very Unlikely

Not Relevant__, **Somewhat Relevant**__, **Quite Relevant**__, **Very Relevant**__

Comments/Recommendations_____

On a scale of 1-5 how likely are you to keep that appointment?

1. Very Likely. 2. Somewhat Likely. 3. Neither Likely or Unlikely 4. Somewhat Unlikely

5. Very Unlikely

Not Relevant__, **Somewhat Relevant**__, **Quite Relevant**__, **Very Relevant**__

Comments/Recommendations_____

If no:

What are the barriers that would keep you from seeking free dental care?

No desire

No perceived need for dental care

Lack of transportation

No child care

Time missed from work

Fear of dental care

Health issues prevent attending appointments

Other, specify_____

Not Relevant__, **Somewhat Relevant**__, **Quite Relevant**__, **Very Relevant**__

Comments/Recommendations_____

Instrument #2

Follow Up Telephone Call to Participants for Failure to Schedule Appointment

To be Completed by PI during Telephone Interview with Participant

Participant's Name _____

Date of Initial visit at SRCC _____

Date of Interview _____

Can you tell me why you did not make an appointment at the dental hygiene clinic:

I forgot

I have been too busy

I was nervous or afraid of making an appointment

I changed my mind

Other, please specify _____

Other Unsolicited Comment(s):

Not Relevant___, Somewhat Relevant___, Quite Relevant___, Very Relevant___**Comments/Recommendations** _____

2. Participant did not answer telephone

a. Left message

b. No message system available

c. Non-working phone number

Not Relevant___, Somewhat Relevant___, Quite Relevant___, Very Relevant___**Comments/Recommendations** _____

Appendix G: Lewis-Clark State College Dental Hygiene Clinic Informational Brochure

Becoming a Patient

The Dental Hygiene Clinic is open to any interested adults and children in the community.

The Clinic is open from September through June. Please contact the Clinic Office Coordinator at 208-792-2930 for exact times or to schedule an appointment.

Appointments are required.

You will first be scheduled for a screening or evaluation appointment (about 1 hour), and then matched with a student who will provide your care. You should expect appointments to last 1-3 hours. You may need to return for treatment and the number of appointments necessary will be determined by the complexity of your dental hygiene needs.



Note: Children typically do not need a screening visit and will have shorter appointments.



Lewis-Clark State College Dental Hygiene Clinic

Wittman Building • 526 11th Ave
Lewiston, ID 83501
PH: 208.792.2930 • FAX: 208.792.2713
EMAIL: dental@lcsc.edu

- DIRECTIONS -

LCSC Dental Hygiene Clinic is south of campus. Our doors open into the large parking lot just off of 11th Avenue. Coming from 21st Street we are on the left after the baseball field. Coming from Snake River Avenue turn on 11th Avenue and we are the first college building on the right.

Project is funded in part by The Regence Foundation Grant

Lewis-Clark
S T A T E
C O L L E G E

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Promoting Healthy Smiles

PH: 208.792.2930

FAX: 208.792.2713

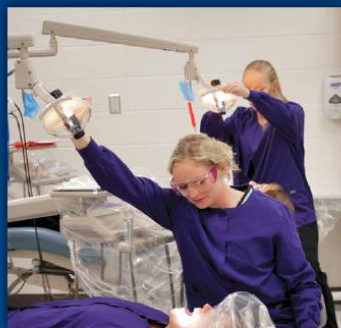
EMAIL: dental@lcsc.edu

Quality Care

Welcome to the Dental Hygiene Clinic at Lewis-Clark State College. Our dental hygiene students and our highly-qualified dental professionals are looking forward to providing you with educational, preventive, and therapeutic dental hygiene services at a nominal fee. Our services are available to all area residents.

Due to the nature of an educational clinic, your treatment will progress at a slower pace than in a dentist's office. The instructor/student interaction requires more time, therefore, you can be assured your visit meets the highest standards of quality care.

Thank you for your interest in our program.



Preventive Services Include:

- Health Screening (blood pressure check, oral cancer screening)
- Dental Examination
- Oral Prophylaxis (cleaning and polishing teeth)
- Oral Health Instruction (with home care kit)
- Necessary Radiographs (x-rays may be sent to your dentist upon request)
- Fluoride Treatment
- Denture/Removable Appliance Cleaning
- Sealants
- Polishing Existing Fillings



Fees

Senior citizens (60 and over).....	\$30.00
Adults (18-59 years).....	\$40.00
Children (3-17 years).....	\$20.00
Sealants	\$5.00/tooth
Radiographs: Full series	\$25.00
Panoramic	\$20.00

Our fees are minimal, used only to cover the expense of supplies. There is no fee for the screening visit.

Payment is expected at check-in the day services are provided. We accept cash or checks only.

Appendix H: Author Guidelines of the Journal of Dental Hygiene

Author Guidelines

Editorial Staff

Editor-in-Chief	Administrative Editor	Staff Editor	Editor Emeritus
Rebecca Wilder, RDH, MS	Randy Craig	Josh Snyder	Mary Alice Gaston, RDH, MS

Statement of Purpose

The Journal of Dental Hygiene is the refereed, scientific publication of the American Dental Hygienists' Association. It promotes the publication of original creative work related to dental hygiene research, education and evidence-based practice. The Journal supports the development and dissemination of a unique dental hygiene body of knowledge through scientific inquiry in basic, behavioral, clinical and translational research.

Author Guidelines

Starting with the Summer 2004 issue, the Journal has been published online. The online format provides searching capabilities to Journal readers by establishing a link to dental hygiene research indexed through the National Library of Medicine and Medline.

Manuscript Requirements

Manuscripts are evaluated for quality, depth and significance of research, comprehensive evaluation of the available literature and the expertise of the author(s) in the given subject. Content must provide new information and be of general importance to dental hygiene. The Journal discourages submitting more than one article on related aspects of the same research. If multiple papers are submitted from the same project, significant differences in the papers must be evident.

Originality

Manuscripts must be original, unpublished, owned by the author and not submitted elsewhere. Authors are responsible for obtaining permission to use any materials (tables, charts, photographs, etc.) that are owned by others. Written permission to reprint material must be secured from the copyright owner and sent to ADHA when the manuscript is accepted for publication. The letter requesting permission must specifically state the original source, using wording stipulated by the grantor.

Disclosure

Authors are obligated to identify any actual or potential conflict of interest in publishing the manuscript. This includes association with a company that produces, distributes or markets any products mentioned, or with funding provided to help prepare the manuscript. Disclosures should appear at the beginning of the manuscript.

Manuscript Categories

The Journal publishes original scientific investigations, literature reviews, theoretical articles, brief reports, and special feature articles related to dental hygiene. Specific Categories of articles are as follows: Research, Critical Issues in Dental Hygiene, Innovations in Education and Technology, Literature Reviews and Short Reports. All submissions are reviewed by the editor and by members of the Editorial Review Board.

Original Research Reports – limited to 4000 words (excluding references and Tables/Figures)

Include reports of basic, behavioral, clinical and translational studies that provide new information, applications or theoretical developments. Original Research Reports include an Abstract, Introduction (including the review of the literature and ending with a statement of the study purpose), Methods and Materials, Results, Discussion and Conclusion.

Title Page: This page should include: 1) title of article, which should be concise yet informative, 2) first name, middle initial and last name of each author, with highest academic degrees, 3) each author or coauthor's job title, department and institution or place of employment if other than academic, 4) disclaimers/disclosures, if any, 5) name, address, all contact information of author responsible for correspondence about the manuscript and 6) funding sources for the project, equipment, drugs, etc.

Abstract: Approximately 250 words. Use the headings "Purpose" (purpose), "Methods" (design, subjects, procedures, measurements), "Re-

sults" (principal findings), and "Conclusion (i.e. Major conclusions.)" The abstract must be able to stand alone. References should therefore be avoided.

Keywords: Four to ten keywords should be chosen that are consistent with Medical Subject Headings (MSH) listed in Index Medicus. These key words will be used for indexing purposes. Keywords should be listed at the end of the abstract.

NDHRA: Identify how the study supports a specific topic area and related objective from the National Dental Hygiene Research Agenda. For example: This study supports the objective: Assess strategies for effective communication between the dental hygienist and the client, under Health Promotion/Disease Prevention. NDHRA statements can be found at: http://www.adha.org/downloads/Research_agenda%20-ADHA_Final_Report.pdf

Text: The body of the manuscript should be divided into sections preceded by the appropriate subheading. Major subheadings should be in capital letters at the left-hand margin. Secondary subheads should appear at the left-hand margin and be typed in upper and lower case and in bold face.

Introduction (including the literature review): Cite a variety of relevant studies that relate to the need for the current study and its significance. References should be as current as possible, unless a hallmark study is included. Compare findings of previous studies, clearly indicating all sources of concepts and data. When a source is directly quoted, use quotation marks. However, use of quotation marks should be limited. End this section with a clear statement of the purpose of the study, hypothesis or research objectives.

Methods and Materials: Describe the research design (e.g. randomized controlled trial) and procedures (e.g. IRB approval, target population, inclusion/exclusion criteria, recruitment, informed consent, variables to be tested, instruments, equipment, procedures and method of data analysis). Specify the measurements and statistical tests used as well as related levels of significance. Furthermore, assure an adherence to all pertinent federal and state regulations concerning the protection of the rights and welfare of all human and animal subjects.

Results: Summarize all relevant data and

study findings. Do not repeat in the text the data reported in tables and figures verbatim, but do refer to the data and emphasize important findings (e.g. Table 1 shows that most of the subjects were African American and between the ages of 12 and 16).

Discussion: Evaluate and interpret the findings. Compare them with those of other related studies. Discuss how they relate to dental hygiene practice, profession, education or research. Include overall health promotion and disease prevention, clinical and primary care for individuals and groups and basic and applied science. Discuss study limitations; implications for dental hygiene practice, education, and research; and recommendations or plans for further study.

Conclusion: State the conclusions, theories, or implications that may be drawn from the study. This section should be 1-2 paragraphs or can be listed as bulleted points.

Acknowledgments: Be brief and straightforward. Example: "The authors thank Jane Smith, RDH, for her assistance in developing the survey instrument." Anyone making a substantial contribution to the conduct of the research or the resulting report should be appropriately credited as an author.

Literature Reviews – limited to 3000 words (excluding references and Tables/Figures)

A presentation of relevant and primary published material on a specific topic constitutes a comprehensive literature review. Such a review includes a summary and critique of the current status of the topic, and the aspects requiring further study.

Abstract: Literature reviews begin with a non-structured abstract—a brief statement of purpose, content summary, conclusions, and recommendations.

Keywords: At least four keywords should be listed following the non-structured abstract.

NDHRA: Identify how the literature review supports a specific topic area and related objective from the National Dental Hygiene Research Agenda. For example: This review supports the objective: Assess strategies for effective communication between the dental hygienist and the client, under Health Promotion/Disease Prevention.

Short Reports – limited to no more than 2000 words plus references and illustrations. Illustrations should be limited to a total of no more than 2 (e.g. 2 figures or 2 tables, or 1 figure and 1 table)

The Journal publishes short reports related to dental hygiene. Short reports are limited in scope and should begin with a brief, non-structured abstract that describes the topic. The abstract should contain at least four keywords. Identify how the report supports a specific topic area and related objective from the National Dental Hygiene Research Agenda. A concise introduction; literature review; detailed description of the topic or activity; and discussion, conclusion, and recommendations must also be included. References are necessary to support the rationale and methods presented.

A short report may describe a clinical case study, an educational innovation, a research method, a concept or theory, or other current topics.

Case Study: A report that describes a unique aspect of patient care not previously documented in the literature. Such reports usually focus on a single patient or groups of patients with similar conditions. Suitable topics include, but are not limited to, innovative preventive methods or programs, educational methods or approaches, health promotion interventions, unique clinical conditions or pathologies and ethical issues.

Theoretical Manuscript: A report that provides a well-supported explanation for natural phenomena that clarify a set of interrelated concepts, definitions, or propositions about dental hygiene care or processes. Such reports provide new knowledge, insight, or interpretation; and discussion, conclusions, and recommendations. These reports begin with a non-structured abstract. At least four keywords are listed at the end of the abstract.

Critical Issues in Dental Hygiene – limited to 4000 words

The purpose of this section is to highlight challenges and opportunities pertinent to the future directions of the profession of dental hygiene.

Innovations in Education and Technology – limited to 4000 words

The purpose of this section is to feature short reports of innovative teaching applications and techniques as well as new technologies available

for increased communication and learning in dental hygiene education.

Manuscript Preparation and Style

Standard usage of the English language is expected. Manuscripts should be created in Microsoft Word with margins of at least 1 inch. Double spacing should be used throughout the manuscript. Font size is 12 point in Times New Roman style. All pages should be numbered, consecutively beginning with title page, to include references, tables and legends for illustrations. Begin each of the following sections on separate pages: title page, abstract and key words, text, acknowledgements, references, individual tables and legends. Do not embed tables and figures in the body of the text. If figures are large files, they can be submitted as separate documents. Clearly indicate who is willing to handle correspondence at all stages of the review process and publication. Ensure that telephone and fax numbers are provided for the corresponding author in addition to the email address.

Spell out abbreviations and acronyms on first mention followed by the abbreviation in parentheses. Limit the overall use of abbreviations in the text.

Throughout the text, use generic, nonproprietary names for medications, products and devices. At the first mention, state the generic name followed in parentheses by the trade name with the register® or trademark™ symbol and the manufacturer's name and city/state.

Example: Chlorhexidine (Peridex®; 3M ESPE, Minneapolis, MN) coded or abbreviated as CHX

Author Biography

Please include a brief biographical sketch of each author at the beginning of the manuscript. List names, credentials, titles, affiliations and locations. Example: "Mary B. Jones, RDH, MA, is assistant professor and clinic director, Department of Dental Hygiene; Bill R. Smith, DDS, MEd, is associate professor, Department of Pediatric Dentistry. Both are at the University of Minnesota in Minneapolis."

Visual Aids

Tables: All tables must have a title that is brief but self-explanatory. Readers should not have to refer to the text to understand a table. Also, the main body of text should not overly depend on the tables. Indicate explanatory notes to items in the

table with reference marks (*, #). Cite each table in the text in the order in which it is to appear. Identify tables with Arabic numbers (ex: Table 1).

Figures: Includes charts, graphs, photographs, and artwork. All should include a brief caption and use Arabic numerals (ex: Figure 1). Cite each figure in the text in the order in which it will appear.

Photographs: High-resolution digital photos are preferred, with a resolution of at least 300 pixels per inch. Submitting two positive prints of each quality photograph is also permitted. Color prints are preferred over black-and-white prints. Photographs are not returned unless requested by authors.

References

The Journal follows National Library of Medicine (NLM) citation style. Please refer to <http://medlib.bu.edu/facts/faq2.cfm/content/citationsnlm.cfm> for specifics.

Each reference should be numbered in the order it first appears in the text. If a source is cited more than once, the first reference number it is given is used throughout. Each reference in the text should be in superscript format. Continuous references should be connected with a dash (example: 7, 8-10). ADHA editorial staff does not assume responsibility for verifying references. For more information and detailed examples, please visit the International Committee of Medical Journal Editors at www.icmje.org. Please ensure that every reference cited in the text is also present in the reference list and vice versa. Citation of a reference as "in press" implies that the item has been accepted for publication.

Please list all authors. Capitalize only the first word of the journal article title, and use the NLM journal abbreviations found at www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=journals. If more than 6 authors are listed, list the first 3 followed by et al.

Examples of reference citations:

Example Article in a Journal: Michalowicz BS, Hodges JS, DiAngelis AJ et al. Treatment of periodontal disease and the risk of preterm birth. *N Engl J Med*. 2006;355(18):1885-1894.

Smith MA, Jones BB. Curette sharpness: a literature review. *J Dent Hyg*. 1996;77:382-390.

Article from a Journal published online

only: Hollister MC, Anema MG. Health behavior models and oral health: a review. *J Dent Hyg* [Internet]. 2004 [cited 2005 Feb 17];78(3):e6. Available from <http://www.adha.org>. Registration required for access.

Book citations: Spolarich AE, Gurenlian JR. Drug-induced adverse oral events. In: Daniel SJ, Harfst SA, Wilder RS, ed. *Mosby's Dental Hygiene: Concepts, Cases and Competencies*. 2nd ed. St. Louis, MO: Mosby/Elsevier Publishing. 2008. p. 259-276.

Internet citations: NLM requires the standard elements of a citation for an Internet resource, with a few modifications. The main elements required:

Polgreen PM, Diekema DJ, Vandenberg J, et al. Risk factors for groin wound infection after femoral artery catheterization: a case-control study. *Infect Control Hosp Epidemiol* [Internet]. 2006 Jan [cited 2007 Jan 5];27(1):34-7. Available from: <http://www.journals.uchicago.edu/ICHE/journal/issues/v27n1/2004069/2004069.web.pdf>

Poole KE, Compston JE. Osteoporosis and its management. *BMJ* [Internet]. 2006 Dec 16 [cited 2007 Jan 4];333(7581):1251-6. Available from: <http://www.bmj.com/cgi/reprint/333/7581/1251?maxtoshow=&HITS=10&hits=10&RESULTFORM AT=&andorexactfulltext=and&searchid=1&FIRST INDEX=0&sortspec=relevance&volume=333&firstpage=1251&resourcetype=HWCIT>

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Manuscripts should be submitted as a Microsoft Word attachment via email to the Staff Editor, Josh Snyder at josh@adha.net. There is no charge for submission. The ADHA Communications Division will acknowledge receipt of the submission by email.

Each manuscript is assigned a log number, which authors should use for correspondence. All papers are reviewed by the editor, blinded to remove any author identification and assigned to three reviewers. The editor reserves the right to return, without review, any manuscript that does not meet Journal criteria for formal review.

The review process takes approximately 10 to 12 weeks, depending on the need for authors to make revisions. All reviewer comments, as well as notification of acceptance or rejection, are submitted to the corresponding author.

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For further information, please contact the Journal of Dental Hygiene by phone at 312-440-8900 or by e-mail at communications@adha.net.

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Example: Additionally, the efforts of the office administrator, with regard to accommodating schedules and financing, could have been a factor (Vaccari, personal communication, April 2008).

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Section II: Publishable Manuscript

Developing an Oral Health Referral System: An Exploratory Study

By

Lillian Bowen, RDH, BS

MSDH Candidate

Department of Dental Hygiene, Idaho State University

JoAnn Gurenlian, RDH, MS, PhD

Professor, Graduate Program Director,

Department of Dental Hygiene, Idaho State University

Denise M. Bowen, RDH, MS, Professor Emeritus

Department of Dental Hygiene, Idaho State University

Contact Author Information:

JoAnn Gurenlian

921 South 8th Ave.

Pocatello, ID 83209

(208) 240-1443

gurejoan@isu.edu

Abstract

Purpose: Safety net dental clinics provide oral healthcare to dentally-underserved populations. The purpose of this study was to explore factors that might impact the development and implementation of a referral system model for safety net patients to access preventive oral health services when those services are not provided.

Methods: Participants (N=36) who sought oral care at a safety net dental clinic were interviewed using a semi-structured interview schedule regarding demographics, dental care history, and likelihood to follow up on referral for dental hygiene care. Referrals were made to a dental hygiene program for preventive oral care at no cost to the participant. Follow-up determined whether or not the participants made and attended appointments. Data were analyzed using descriptive statistics and Fisher's Exact test.

Results: There was no statistically significant difference ($p \geq 0.05$) between interview responses of the participants who followed up (N=29) and those that did not (N=7). All participants reported interest in preventive care by dental hygiene students. The majority reported they were very likely to make (n=26, 72.2%) and keep (n=30, 83.3%) an appointment, although most did not follow through. The most frequent reason cited by those contacted (n=20, 74%) was forgetting to make an appointment. A higher percentage of the working poor (57.1%) followed up than the unemployed (27.5%).

Conclusion: More research is needed to develop effective measures for referral of dentally-underserved populations. Facilitating appointments or reminders may be beneficial. Safety net clinics and dental hygiene schools or clinics might pursue collaborative arrangements to facilitate access to preventive care.

Keywords

Referral, Safety Net Clinics, Underserved Population, Access to Health Care, and Dental Hygienist

National Dental Hygiene Research Agenda

This study addressed the research agenda objective: to identify, describe, and explain mechanisms that promote access to oral healthcare, such as: financial, physical, and/or transportation.

Developing a Preventive Oral Health Referral System

Introduction

A study conducted by the American Dental Association cited cost as one of the main barriers to seeking dental care across all income groups in the United States.¹ Safety net dental clinics have been developed to treat low-income and dentally-underserved populations. Preventive oral health care is needed to reduce the cost of dental disease, both financially and in time lost from missed school and work hours.¹ If an appropriate referral system can be developed to refer dental safety net clinic patients for oral health screenings and preventive services delivered by dental hygiene schools or clinics, the guidelines could be employed to increase access to preventive care for underserved populations being treated in safety net dental clinics unable to provide these services.

Low income individuals do not seek dental care as often as their middle or high income counterparts.² The 2015 Federal Poverty Guidelines defines poverty as \$15,250 for a family of two, and \$24,250 for a family of four.³ Low income populations have been described as individuals with income levels at twice the federal poverty level.⁴ In 2006, Bailit, et al. reported that approximately 27.8% of low income people visited the dental office at least once yearly, compared to 40.4% of middle income individuals, and 53.5% of high income individuals. These findings are consistent with a more recent report that indicated in 2009, approximately 17 million children received no dental care, and low income adults were twice as likely as higher income adults to have gone without care in the previous year.⁵ Although cost is the main reason individuals do not seek dental care, there are other obstacles which prevent people from seeking oral health care. The previously mentioned 2014 ADA study also found that a perceived lack of need for

dental care was also a major factor for not seeking oral health care.¹ Other reasons cited included lack of time, cultural and language difficulties, transportation difficulties, difficulties finding a dentist that accepted Medicaid, anxiety over dental visits, and the lack of teeth.¹

Dental safety net clinics provide services to underserved and vulnerable populations. These dental safety net clinics consist of Federally Qualified Health Centers, dental schools, mobile dental clinics, and public health departments.⁶ Dental hygiene and dental schools are an important part of the safety net because their students spend time at community based sites.⁷ A safety net dental clinic was developed in 2009 in Lewiston, Idaho. This dental safety net clinic provides dental extractions only and there is no formal mechanism or referral system in place to collaborate with the local dental hygiene program to expand services available to the safety net patients. The dental safety net is often a last resort for low-income families, but could be the first step in educating patients and guiding their actions toward preventive care.

Most oral diseases are preventable; therefore, prevention of dental problems may be more cost effective than treating dental disease.² Economic evaluation is an important factor for consideration when disease prevention is involved.² Economic evaluation is often used by individuals or groups to make decisions about public health policy. The decision makers must weigh the most viable options for healthcare. The outcome and cost for a healthcare initiative must be examined, and the cost is considered in making a decision about what is most advantageous intervention program.² In a study conducted by Delta Dental Plan, it was shown that, in Michigan, between 2008-2010, the average cost for an emergency room visit for an individual with tooth pain was \$209.⁸ The ADA

summarized the cost of emergency room treatment in their report: *Breaking Down Barriers to Oral Health for All Americans*.⁹ The ADA noted the total cost for an emergency room treatment for an abscessed tooth was approximately \$ 236 for palliative care through the use of antibiotics and pain medication. The dental problem is not solved and is likely to recur, causing additional visits to the emergency room.⁹ The total cost for having the tooth extracted at a dental office in 2013 was estimated by the ADA to average \$156. The problem would be solved and no other treatment would be necessary.¹⁰

The difference in cost between primary preventive dental care and secondary or tertiary care was also found in a study by The Agency for Healthcare Research and Quality comparing treatment received by Medicare beneficiaries.¹¹ The authors examined the 2009 Medicare Current Beneficiary Survey. When the Medicare beneficiaries accessed preventive care, they visited the dentist more often overall, but more of these visits were less expensive than those for beneficiaries who did not receive preventive care. This difference resulted in an annual savings of approximately \$260 per person in 2009 for attendees who received preventive dental care. The researchers concluded that “coverage for preventive dental care could pay off in terms of both improving the oral health of the Medicare population and limiting the cost of expensive non-preventive dental care”.¹¹

The economic ramifications of preventive dental care can also be measured in hours of work lost due to dental problems. In a 2012 report, *Dental Crisis in America*, it was noted 164 million work hours were lost due to dental disease.⁵ The economic impact of dental disease is not the only concern of prevention of dental disease; dental disease is

also the leading cause of absence in school children. Children lose up to 51 million hours of school per year due to dental problems.⁵ In 2009, 504,000 children from ages five to seventeen missed at least one day of school due to dental problems in California alone.⁵ Since dental disease is more prevalent in low income families, dental disease and related loss of school time may perpetuate future disparities. Because of the cost savings with primary prevention and the economic impact of lost working and school hours, it follows logically that primary prevention of oral disease is more desirable than secondary or tertiary dental treatment of disease.

Expanding the oral health workforce is a potential solution for increasing access to underserved populations. In some states, consumers have direct access to dental hygienists, or hygienists practice in areas of high need and in non-traditional settings without a dentist on site. The dental hygienist is a primary care oral health professional, licensed in dental hygiene to provide education, assessment, research, administrative, diagnostic, preventive, and therapeutic services that support overall health through the promotion of optimal oral health.¹³

If the use of dental hygiene services can, indeed, reduce oral healthcare disparities and costs, then underserved populations could potentially benefit from preventive services provided by oral health professional students at a dental hygiene school. According to the ADA's 2013 Survey of Dental Fees Report, the average cost for an oral prophylaxis was \$85.38, a full mouth series of radiographs was \$141.93, and a comprehensive oral examination was \$85.64 in the Pacific U.S. Census Division.¹⁰ The dental hygiene clinic located at the dental hygiene school in Lewiston, Idaho operates a clinic which offers an adult prophylaxis, full mouth series of radiographs, and a

comprehensive oral examination for \$55, a fraction of the ADA's cost for similar services. The low cost of dental hygiene preventive services, when provided by a dental hygiene student, has the potential to increase the accessibility for low income patients who would not be able to afford dental services otherwise.

Specific criteria or recommendations for a system designed to facilitate referral patients from a dental safety net clinic to other clinics for additional oral healthcare services have not been established. A search of the U.S. Department of Health and Human Services National Guideline Clearinghouse provided no guidelines pertaining to dental or oral health referrals. However, the ADA has general guidelines to follow when referring dental patients to other general practitioners or dental specialists. Referrals should always be given on the referring dentist's professional judgment with the best interest of the patient in mind. The patient should always be educated about the reasons for any referrals, and they should always be included in any treatment decisions. Any patient apprehension can be eased through discussion and questions with their primary dental practitioner when unfamiliar treatment and providers could become involved in the patient's oral healthcare.¹⁴

If safety net dental clinics that do not provide comprehensive oral healthcare could refer patients to dental hygiene schools for preventive treatment and education, access to dental care may possibly be increased for the dentally underserved, low income populations, and vulnerable patients. Therefore, the purpose of this study was to explore the development of a referral system from an extraction only dental safety net clinic to a dental hygiene school for preventive oral care services, and to determine the barriers to

follow through for those safety net patients accepting or declining referrals for dental hygiene care.

Methods

This exploratory study used interview-administered surveys of patients at a safety net dental clinic, the Snake River Community Clinic (SRCC). Exploratory research is appropriate because the problem of providing preventive services to individuals who do not have access to dental care has not been clearly defined, as yet. In fact, the real scope of the problem of patients' acceptance and follow through with referrals for oral healthcare is unclear. Information obtained will help to define the problem, and perhaps generate hypotheses to be tested in the future.

SRCC has been an extraction-only safety net clinic that has been in operation for three years, providing medical care for uninsured people experiencing dental pain. Services delivered by faculty and students at the local dental hygiene school include dental radiographs, dental examinations, oral non-surgical periodontal therapy, oral health education, and limited restorative procedures. These two locations were chosen due to their accessibility to the Principal Investigator (PI) and to the general public.

The convenience sample for this study included all safety net dental patients (N=36) attending appointments between March and October, 2014 who agreed to participate. These participants were ≥ 18 years of age and capable of providing informed consent. There was no exclusion criterion. The study protocol was submitted and approved by the Human Subjects Committee at the institutional review board at the sponsoring institution following an expedited review (approval # 4085).

Data collection instruments used in this study included two self-designed, interview-administered surveys. The first interview-administered survey form was used during an initial interview to record participant's responses to a series of questions regarding demographics, willingness to accept a referral, and likelihood to make and attend a dental hygiene appointment. The second interview-administered survey form was used to record information approximately two weeks after the initial interview obtained during a follow-up telephone call to the participants, initiated by the PI, to determine if they made and attended a dental screening appointment at the dental hygiene clinic. This interview-administered survey form also included questions for any participant who reported not making a screening appointment to record participants' reason(s) for failure to make the appointment.

The self-designed instruments were validated by using a content validity index. A panel of five experts with experience in treating safety net dental patients or authoring publications regarding access to care for the economically disadvantaged reviewed the instruments to determine if the interview questions had content validity. Only items that were rated strongly relevant by the majority of the reviewers to the purpose of the research and the research questions by the experts were included in the two interview schedules. The instruments were revised as needed based upon the outcomes of the expert review. Reliability was not determined for this study because the study was exploratory in nature.

The PI verbally conducted all interview-administered surveys and used the data collection forms to record responses. Once a patient at the SRCC safety net clinic expressed interest in the study and informed consent was obtained, the PI immediately

began the initial interview by asking the participant a series of questions, utilizing the first instrument. Preventive services were offered to the participants at no cost. If the participant was willing to be referred to the dental hygiene program for free oral preventive care, the participant was given a pamphlet with information on how to contact the dental hygiene clinic for scheduling and what to expect during the initial dental hygiene appointment. Participants were informed that, for the purpose of the study, the participant must make contact with the dental hygiene school within two weeks.

The PI directly phoned each participant and used the second interview-administered survey instrument to ascertain if an appointment had been made and, if not, the reason why no appointment had been made. The participants who scheduled a preventive appointment were assessed by dental hygiene students during an initial screening appointment. At that time, the dental hygiene student scheduled the patient for a subsequent appointment at the dental hygiene program's clinic for preventive oral health care services as indicated.

Descriptive statistics and percentages were used to summarize demographics of the study's participants and the categorical data generated from interview-administered survey items. The descriptive data analyses included means and standard deviations to summarize demographic information about the sample and percentages of responses to each interview item. Fisher exact tests were used to determine if there were any statistically significant differences in the categorical responses of the participants that followed through with making and attending an appointment for preventive oral health care and those that did not.

Results

Individuals (N=36) attending appointments at the safety net clinic during the study period were invited to participate and all 36 (100%) of them consented to participate in the study. Table 1 highlights the demographic information for this sample. As can be seen from this table, the majority of participants were female (n=23, 63.9%); had a high school diploma (n=7, 19.4%) or some college education yet no degree (n=11, 30.6%); and were unemployed (n=15, 41.6%) or unable to work (n=5, 13.9%). Earned income was less than \$10,000 per year for most participants (n=24, 66.7%). Seven participants followed through with the referral to the dental hygiene clinic and received preventive dental hygiene care, and 29 participants did not call to make appointments. The majority of the participants who followed through with the referral reported being employed (n=4, 57.1%); in comparison, eight (27.5%) of the participants who did not follow up were employed.

Table 2 summarizes the information obtained from participant interviews concerning their dental experiences and interest in a referral. The majority of the participants did not have a regular dentist (n=33, 91.7%) but reported having had regular dental visits in the past (n=27, 75%). More than half of the participants (n=21, 58.3%) had not had a dental visit in over five years, and the majority (n=29, 80.6%) were experiencing dental pain. All of the participants reported being interested in receiving preventive care and open to having dental hygiene students provide that care. In addition, the majority of the participants reported that they were very likely to make (n=26, 72.2%) and keep (n=30, 83.3%) an appointment for preventive oral health care. All seven (100%)

of the subjects who followed through with making and attending the appointment reported being highly likely to do so.

Regarding perceived barriers or what would facilitate making and keeping an appointment, the most frequent response (n=15, 41.7%) was that there were no obstacles to scheduling and keeping their oral health appointments. The most frequent response regarding perceived barriers to making and keeping a dental care appointment was cited as not having flexibility in their work or schedule (n=8, 22.2%). The second most frequently perceived potential barrier was transportation (n=7, 22.2%).

Table 2 also demonstrates that the majority of participants did not call the dental hygiene clinic for their oral health appointment (n=29, 80.6%). Follow-up telephone calls were made to those who did not schedule appointments. Nine participants (25%) no longer had working telephone numbers or did not respond to messages left, and 27 (75%) of the participants were contacted. Of the participants contacted that did not schedule a follow up appointment, the most frequent reason cited for not scheduling an appointment was that the participant forgot to call (n=11, 55%) or in addition to forgetting, they were also too busy to call (n=2, 7%). Other reasons included health problems (n=5, 18.5%), and 2 responded that they were too busy to call (7%).

Fisher's exact test was used to determine if differences existed between participants who followed through with the referral by scheduling and attending the appointment for preventive oral healthcare at the dental hygiene clinic (N=7) verses those who did not (N=29). No statistically significant differences were found ($p>0.05$) for any of the interview questions with categorical responses. No further data analysis was

completed to compare the groups due to the small number of individuals who did follow the referral provided.

Discussion

The purpose of this exploratory study was to explore factors that should be included in a referral model for safety net patients to receive additional preventive services through a cooperating agency, including criteria that should be considered to foster compliance, the rate of compliance, and perceived barriers to scheduling and attending a referred dental appointment.

The results of the Fisher's exact test likely did not show any statistical differences between the interview responses of the participants who made an appointment for preventive oral health care and those that did not because of the low number of participants that actually did follow through with appointments and keep them. Thus, an exploration of the interview responses was conducted to identify patterns or common characteristics that appeared in the participants who did contact the dental hygiene school for preventive appointments when compared with those who did not. Both groups had a majority of individuals who earned less than \$10,000 per year. These findings are not surprising in a sample of patients attending an extraction-only safety net clinic as safety net clinics are designed to provide care for the underserved population. The study participants lived below the poverty level, and previous research has shown that individuals in this socioeconomic group have more dental problems than their higher income counterparts.¹ Most of these patients also reported being in pain and reported currently having no dentist. This finding agreed with the results of a study conducted in the United Kingdom which showed that low-income individuals who were most likely to attend an oral health care appointment were experiencing oral problems or pain and did

not have a regular dentist.¹⁵ All of the participants in this study also stated that they were interested in receiving preventive dental hygiene care. Research has shown that a lack of interest in receiving care is a major reason for not visiting a dentist.¹ Despite the fact that these individuals stated that they wanted to receive preventive dental hygiene care, most did not follow through by making an appointment and seeking those services. This lack of follow through raises questions about the actual interest and motivation of the study's participants to seek preventive care versus their stated intentions.

All of the participants who followed up reported being “very likely” to make and “very likely” to attend an appointment for preventive oral health care. This finding parallels the ADA's recommendation that referrals be made according to the professional judgement and experience of the treating dentist. The ADA also recommends that appropriate referrals take into consideration the desire of the patient. According to a study by Zoitopoulos and Jenner (1999), only highly motivated people should be referred, as up to one-third of the patients who were referred from their community dental service to general dental practitioners did not attend their referred appointment.¹⁶

Interestingly, the majority of the individuals that did follow through with making and attending appointments for preventive dental hygiene services were employed. One might presume that scheduling would be more challenging for employed individuals in comparison to the unemployed, since this perceived barrier was the most frequently cited by participants during the initial interview. A lack of time also has been cited in the literature as a reason for not making and attending appointments.¹ Further study of reasons why the working poor might have been more likely to follow through with the referral than the unemployed is indicated as a study conducted in Glasgow also noted that

the majority of patients that failed dental appointments were unemployed.¹⁷ If limited funding is available for safety net dental clinics to provide referrals for reduced-cost or no-cost preventive dental hygiene care at dental hygiene schools or clinics, it may be best spent on the working poor. It may also be advantageous to explore the psychosocial aspects of unemployment in relation to attending appointments for preventive oral health care. Other barriers relating to unemployment could be the cause for missed appointments, such as depression, substance abuse, or a fatalistic view of oral healthcare. These barriers were not discussed in the previously cited ADA's report.

The second most cited perceived potential barrier to making and attending an appointment was related to transportation difficulties. This finding agrees with a study conducted by U.S. Senate Committee on Health, Education, Labor, & Pensions (2012) that cites transportation challenges as a major issue to seeking dental care.⁵ Perhaps safety net dental clinics could secure funding for individuals to obtain transportation and examine ways for individuals to travel to dental services such as local bus routes.

The majority of both groups reported they perceived no barriers to making and attending an appointment. A follow-up telephone call was made to those individuals who failed to follow through with the referral. Cost has been cited in the literature as the primary reason that individuals do not seek dental care¹; however, cost was not a factor for study participants as the preventive oral health services were offered at no cost. The attempt to address cost as the main barrier to seeking care makes the low compliance in this study more difficult to understand. It has been noted in the literature that offering free care does not increase appointment attendance. In a study of 3139 patients, it was

concluded that the unique needs of each patient must be understood to develop strategies to increase patient attendance of appointments.¹⁸

The most frequently cited reason for not making an appointment was that the participant forgot to call. A few respondents in this group also reported they would have appreciated a reminder call. It follows logically that a telephone call or some form of personal contact to remind the referred patient to call and make the preventive care appointment might increase adherence with the referral. In addition, it may be advantageous for the safety net dental clinic personnel to make the appointment for the referred individual at the time the referral is provided.

There is a need for alliances between safety net dental clinics that provide limited services and dental hygiene schools or dental hygienists providing direct access to preventive oral healthcare. Dental hygienist and dental hygiene students are at the forefront of preventive oral health care and oral health education. In a study conducted at a university dental clinic in 2005, it was shown that patients with lower oral health literacy were more likely to fail scheduled appointments.¹⁹ If dental hygienists or dental hygiene students could educate people on the need for preventive care, perhaps individuals would be more consistent with making and attending appointments. Dental hygienists or dental hygiene students could potentially complete dental screenings at safety net dental clinics and immediately schedule patients for preventive care. The hygienist or students could then follow up with reminder calls to the scheduled patient as a routine courtesy provided by most healthcare providers. Reminder calls have been cited in the literature as improving patient success at attending appointments.^{20,21} By completing screenings at safety net dental clinics, dental hygiene students could

potentially meet the preventive needs of safety net dental patients while also gaining more challenging periodontal therapy cases for their own coursework requirements. Patient recruitment opportunities would increase. Student involvement in the safety net dental clinics would also help to improve learning experiences in cultural diversity. The report: *Dental Crisis in America*, points out that student involvement in a variety of settings and delivering care to diverse populations is needed to ensure that future dental professionals will focus on eliminating disparities.⁵

However, a more extensive study would be needed to ascertain if these observations would improve the rate of individuals making and attending a preventive appointment. A future study could examine if employed individuals are more likely than the unemployed to follow through with a referral, and the reasons for this finding, if making the appointment at the time of the referral or providing a reminder call would prompt individuals to make and keep a referred appointment, and whether facilitation of transportation to and from the preventive dental hygiene clinic could improve patient compliance. Lastly, a study could be conducted to determine if collaboration between dental safety net clinics and dental hygiene students or direct access dental hygienists providing screenings, immediate scheduling, and follow-up telephone calls could increase access to preventive care for safety net dental patients.

A qualitative interview of participants with open-ended questions could better determine the exact nature of why making an appointment was forgotten. These studies could include the psychosocial impact of unemployment on individuals such as mental health, substance abuse, and fatalism issues that the unemployed deal with that may impact adherence with dental appointments in general as these issues were not addressed in the

ADA's previously cited report, although it has been noted in the literature that some individuals do not seek dental care due to being "overloaded" in daily living and with survival and that dental care is a low priority.²²

Conclusions

Cost remains the number one reason that individuals do not seek oral care.¹ Safety net dental clinics have been developed to assist low income individuals to receive dental care although some are unable to provide preventive oral care services. Dental hygiene clinics can be used by safety net dental clinics to expand their scope of dental care by providing additional low cost preventive care if these services are not provided at the safety net dental clinic. Effective referral systems from safety net dental clinics to dental hygiene schools or direct access dental hygienists need to be developed to determine how to best serve this population of low income individuals without access to comprehensive oral health care services. Additional studies are needed to determine what motivates patients to use these referral systems to make and keep appointments for additional care.

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Table 1. Demographics of Safety Net Referral Study Participants

	% All Participants (N=36)	Participants Following Referral (n=7)	Participants Not Following Referral (n=29)
Male	13 (36.1%)	2 (28.6%)	11 (37.9%)
Female	23 (63.9%)	5 (71.4%)	18 (62.1%)
Education			
0-8 th grade	1 (2.8%)	0	1 (3.49%)
High School (no diploma)	5 (13.9%)	0	5 (17.2%)
GED	5 (13.9%)	0	5 (17.2%)
High School diploma	7 (19.4%)	3 (42.8%)	4 (13.7%)
College courses (no degree)	11 (30.6%)	4 (57.1%) 0	7 (24.1%)
Associates degree	5 (13.9%)	2 (28.6%)	11 (37.9%)
Bachelor's degree	2 (5.6%)	0	5 (17.2%)
Employment Status			
Employed for wages/self employed	12 (33.4%)	4 (57.1%)	8 (27.5%)
Out of work, seeking work	15 (41.7%)	2 (28.6%)	13 (44.8%)
Homemaker	1 (2.8%)	0	1 (3.49%)
Student	2 (5.6%)	0	2 (6.8%)
Retired	1 (2.8%)	0	1 (3.49%)
Unable to work	5 (13.9%)	1 (14.2%)	4 (13.7%)
Income Level			
Under \$10,000	24 (66.7%)	5 (71.4%)	19 (65.5%)
\$10,000-\$19,999	7 (19.4%)	1 (14.2%)	6 (20.6%)
\$20,000-\$29,999	3 (8.3%)	1 (14.2%)	2 (6.8%)
\$30,000-\$39,000			
\$40,000-\$49,000	1 (2.8%)	1 (14.2%)	0
Over \$49,000	1 (2.8%)	1 (14.2%)	0

Table 2. Dental History of Safety Net Referral Study Participants

Participants	All N=36 (%)	Following Referral n=7 (%)	Not Following Referral n=29 (%)
Current Dentist			
Yes	3 (8.3%)	1 (14.3%)	2 (6.9%)
No	33 (91.7%)	6 (85.7%)	27 (93.1%)
Ever Had Regular Dentist			
Yes	27 (75%)	4 (57.1%)	23 (79.3%)
No	9 (25%)	3 (42.8%)	6 (20.6%)
Last Dental Visit			
Less than 6 months ago	2 (5.6%)	0	2 (6.9%)
6-11 months	2 (5.6%)	0	2 (6.9%)
1-3 years	8 (22.2%)	1 (14.3%)	7 (24.1%)
More than 3-5 years	3 (8.3%)	1 (14.3%)	2 (6.9%)
More than 5-10 years	5 (13.9%)	0	5 (17.2%)
More than 10 years	12 (33.3%)	3 (42.8%)	9 (31%)
Never had dental check-up	4 (11.1%)	2 (28.6%)	2 (6.9%)
Dental Pain			
Yes	29 (80.6%)	5 (71.4%)	24 (82.7%)
No	7 (19.4%)	2 (28.6%)	5 (17.2%)
If No Pain			
Curious About Oral Health	2 (5.6%)	1 (14.3%)	1 (3.4%)
Tooth that Looks Bad	5 (13.9%)	1 (14.3%)	4 (13.8%)
Pain			
One Tooth	6 (16.7%)	2 (28.6%)	4 (13.8%)
More than One Tooth	23 (63.9%)	3 (42.8%)	20 (69%)
Interest in Preventive Care	36 (100%)	7 (100%)	29 (100%)
No Student Care Worries	36 (100%)	7 (100%)	29 (100%)
Make Appointment			
Somewhat Unlikely	1 (2.8%)	0	1 (3.4%)
Somewhat Likely	9 (25%)	0	9 (31%)
Very Likely	26 (72.2%)	7 (100%)	19 (65.5%)
Keep Appointment			
Neither Likely/ Unlikely	1 (2.8%)	0	1 (3.4%)
Somewhat Likely	5 (13.9%)	0	5 (17.2%)
Very Likely	30 (83.3%)	7 (100%)	23 (79.3%)
Facilitate Referral			
Transportation/Gas Money	7 (19.4%)	1 (14.3%)	6 (20.7%)
Flexible work hours/schedule	8 (22.2%)	2 (28.6%)	6 (20.7%)
Reminder Call	4 (11.1%)	1 (14.3%)	3 (10.3%)
Health Problems	1 (2.8%)	0	1 (3.4%)
Nursing Infant	1 (2.8%)	0	1 (3.4%)

None	15 (41.7%)	3 (42.8%)	12 (41.3%)
Follow Referral	7 (19.4%)	7 (100%)	29 (100%)

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