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Screening the Safety Net

Babette L. Southard Mrs
East Tennessee State University

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Screening the Safety Net

A thesis presented to the faculty of the Department of Allied Health Sciences East Tennessee State University In partial fulfillment of the requirements for the degree Masters of Science in Allied Health

by Babette Southard

August 2013

Dr. Constance Sharuga, Chair
Dr. Randy Byington
Dr. Ester Verhovsek

Keywords: dental screening, underserved, basic screening survey, safety-net clinic, effectiveness
ABSTRACT

Screening the Safety Net

by

Babette L. Southard

Safety net clinics across the country struggle with a lack of resources to tackle the needs presented. Screening programs set up for children and elderly have proven to be effective in triaging need, prioritizing care, and maximizing resources. These programs do not currently exist for working uninsured adults. Research was initiated to answer the question: Does the screening process improve patient care for the community clinic? During a 6-week pilot study a licensed dental hygienist performed 30 screenings in the community clinic setting. Findings were recorded and coded according to patient’s level of need identified. Pre- and posttest data for patient care factors were attained. Statistical tests showed a significant effect on patient care factors. While the evidence existed to support the implementation of screening, more research would quantify the specific impact on this population.
DEDICATION

I have often said that to know me is to know about my family. Therefore, I would like to dedicate this thesis to my daughter Alexis Quinn Southard, Jayda (the baby dog), and my husband Richard Roy Southard. I would not have made it through this process without your love, support, and constant encouragement. In fact, I don’t think that I would have even tried. Thank you for adding dimension to my life and for encouraging me to complete my goals. As always, you are my inspiration and motivation.
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Thank you to Dr. Randy Byington, who was also a member of my graduate committee. Thank you for your patience and wisdom throughout this process. I learned the value of research and critical thinking. I will continue to apply those concepts in future endeavors.

One of the hardest parts to write in this thesis has been to properly acknowledge the many people who have contributed toward my achievement of this goal. I have been blessed beyond measure with friends, family, and classmates who have positively impacted my life. Thank you profusely to each and every one of you. You have taught me that life is not simply measuring the product but through making a difference. As I look toward beginning a new phase of my career, I am excited about the paths for the future. I am proud to have traveled this journey with you by my side.
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CHAPTER 1

INTRODUCTION

The unsolved dilemma of access to dental care has proven to be multifaceted and tenacious. Health Resources and Service Administration (HRSA) states, “Oral health is essential to overall general health and well-being, but as Healthy People 2020 national health objectives are being finalized, there is growing recognition that many challenges from 20 years ago have not been adequately addressed” (2010, p. 1). This statement proves that the efforts to solve this problem have obviously fallen short of the mark. In fact, O’Connor (2012) elaborates on the need for more public attention to the ramifications of oral health problems. The author further cites research in the last decade that has positively linked poor oral health to chronic health problems such as diabetes and heart disease. More importantly, O’Connor explains that infections caused from bacteria on the surface of the teeth can cause systemic infections and even death.

In fact, children have died due to a lack of access to dental care. In response to a 12-year-old boy’s death from an untreated oral infection, the American Dental Association (ADA) convened a special session in 2009 in an attempt to address the limited access to care. In a section entitled “Accomplishments and Regrets” access to care for the underserved resounded as the theme. One of the regrets noted was, “[We] still have not solved access problem and it took a child’s death to spark interest” (American Dental Association, 2009, p. 20). While advances in care have been made in dentistry since the summit, proof exists that the problem of access to dental care remains unresolved.

Surgeon General David Satcher’s (2000), ground breaking report on the silent epidemic of oral disease has been cited frequently in the call for increased attention to this pervasive issue. His recent statement was, “When I issued my report, tooth decay was the single most chronic
childhood disease…it still is. There were striking disparities in dental disease across the country. There still are” (Satcher, 2012, p. 1).

Socioeconomics, Ethnicity

It is well established that the uninsured poor populations’ oral health has been affected at disproportionate rates. Oral disease has not discriminated in choosing its victims. However, treatment remains dependent on insurance or the ability to pay out of pocket at the time services are rendered. Moreover, Broder, Skolnik, and Schlussel (2003) elaborate, “As the vanguard of health care has advanced, the gaps between the haves and the have nots, have become even more pronounced and disturbing” (p.105). The Institute of Medicine (2011) report states, “oral health care eludes many vulnerable and underserved individuals—including racial and ethnic minorities, people with special health care needs, older adults, pregnant women, populations of lower socioeconomic status, and rural populations, among others” (p. 1). In addition, “access is hampered by a variety of social, cultural, economic, structural, and geographic factors…”(Institute of Medicine, 2011b, p. 1).

Satcher (2012) shows that over a third of African American children have untreated dental disease in comparison with a fourth of Caucasian children having the same need. Moreover, the 25% of children raised in poverty had twice the number of cavities when compared to those of higher socioeconomic status (American Dental Hygiene Association, 2012 ). The situation for uninsured adults has proven to be much worse. “Workers lost more than 164 million work hours…due to lack of treatment for dental disease” (ADHA, 2001, p. 1). According to the Health and Human Services (2012),

The rate of tooth retention was lower for Hispanic (46%) and non-Hispanic black (43%) adults, compared with non-Hispanic white adults (58%). For adults living
at 100% of the federal poverty level or lower, 42% had not lost a permanent tooth, whereas for adults living above the poverty level, approximately 55% had retained all of their permanent teeth. Complete tooth retention was more prevalent among non-Hispanic white adults (35%) aged 45–64 compared with non-Hispanic black (11%) and Hispanic adults (19%). Complete tooth retention was also higher for adults aged 45–64 living above the poverty level (32%) compared with those living at or below the poverty level (15%). (p.1)

In addition, smokers had four times the risks of poor oral health status as compared to nonsmokers (Health and Human Services, 2008, no.85). Caucasian males have a better 5-year survival rate for oral cancer when compared to African American males (Health and Human Services, 2012).

Economic Implications

The ADHA (2001) cites the lack of sufficient finances as the most prevalent barrier to dental care. The World Health Report of 2003 states, “traditional treatment of oral disease is extremely costly, the fourth most expensive disease to treat in most industrialized countries… the greatest burden of all diseases is on the disadvantaged and socially marginalized” (Peterson, 2003, p. 9). More importantly, Harrington and Estes (2008) show “adults are disproportionately represented and constitute the large majority, with those 18 to 44 years old making up roughly 60% of the uninsured” (p. 89).

Compelling data show that the problem has transcended a rippling effect onto the entire population. O’Connor (2012) quantifies this statement by explaining, “Using an emergency room for dental problems as many uninsured people do, costs taxpayers. In 2010 in Florida, more than 115,000 emergency room visits for dental problems produced charges of more than $88 million”
(O’Connor, 2012, p. 1). In addition, Davis et al. (2010) shows that almost half of Americans lack dental insurance and this barrier to access of preventive dental services has led to the use of emergency facilities. David Krol of the Robert Wood Johnson Foundation states that the statistics show dental needs as the most common reason for treatment in hospital emergency visits (Friedman, 2012).

There are additional factors that should be included when attempting to solve the issue of access to dental care. Providing insurance, facilities, and the workforce will not solve the problem. “Consideration of the impact of culture, ethnicity, income and health insurance, in determining both need and access to dental care, aids in explaining oral health disparities and targeting interventions” (Broder et al., 2003, p. 105). According to the National Institute of Dental Craniofacial Research (2011):

There are several ways to measure access to dental care and dental service utilization, including asking people when they last visited a dentist; determining their judgment of the health of their own mouth; and directly measuring the amount of tooth decay that remains untreated. In general, most of these measures have improved in recent years, although disparities remain among some population groups. However, the number of people who consider their own oral health to be excellent or good has decreased in recent years. Because oral health in general has improved over this time period, it may be that the trend in self-reported oral health reflects increased expectations. (p. 1)

Structure Toward Access

The current fee-for-service structure has proven to be ineffective. Monajem (2006) explains, “Outside dentistry, leaders speak of the ‘disconnect’ that exists between the oral
health needs of the population and the prevalent dental delivery system, questioning its 
organization and financing as well as workforce” (p. 49). The American Dental Association 
ammits the need to further address this problem. They state, “While we may have a system that 
provides dental care for those who can afford it, it fails to provide basic preventive and primary 
oral health services for nearly one third of Americans” (Garcia, Inge, Neissen, & DePaolo, 2010, 
p. 558).

In fact, “to address the dental care access problem, public and voluntary sector organizations 
have developed dental clinics to provide services to populations that are unable to purchase 
private sector care…[referred to as the] ‘safety net’” (Bailit et al., 2005, p. 807). According to 
O’Connor (2012) these clinics are providing care for almost a fourth of the patients in need. 
However, resources are limited and innovative methods to efficiently care for patients are 
needed in order to effectively address the access to care issue. The Institute of Medicine (2011) 
mentions oral health care as an essential component needed in health insurance plans. However, 
the authors state that this would be unrealistic in the current fiscal climate.

In addition, for oral health conditions, prevention through early detection has shown to be 
highly effective in intercepting the progression of disease conditions. The Centers for Disease 
Control and Prevention (2010) show screenings to be an integral part of programs seeking to 
improve health. They further state, “Preventive screenings are an important part of health 
promotion efforts. Many preventive screenings have been recognized as a cost-effective way to 
identify and treat potential health problems before they develop or worsen” (Centers for Disease 
Control, 2010, p. 1). Moreover, The World Oral Health Report 2003 stresses that signs and 
symptoms that are assessed during an examination can save lives through detection of 
inadequacy of nutritional intake, signs of systemic disease and oral cancer (Peterson, 2003).
A fact is needed to clarify any confusion, “A dental screening is not a thorough clinical examination and does not involve making a clinical diagnosis resulting in a treatment plan” (Association of State and Territorial Dental Directors, 2010, p. 2). A complete examination by a licensed dentist with an explorer and radiographs has been shown to be the gold standard.

Screenings have shown to be effective programs. Kettner, Moroney, and Martin (2008) further explained:

Once key data sources are identified and data collections systems are organized, all…perspectives on need can be incorporated in a low-cost and efficient manner. Without this information, managers are likely to find scarce resources being squandered on programs that may well serve to further the bureaucratic status quo rather than to address the concerns of the community. (p. 65)

Statement of the Problem

According to Davis et al. (2010) oral health care has been the most prevalently cited health need across the country. In order to expand the access to dental services, screening programs have been initiated for children and geriatric populations including Medicaid and State Children's Health Insurance Program (SCHIP) programs. However, according to Wallace and MacEntee (2012), “employed low-income population, often referred to as ‘the working poor’ [do not have current programs]” (p. 38). Moreover, Davis et al. showed a need for inclusion of adults into such programs.

The Nelson County Community Clinic provides dental services to residents of the county who are in the working age group of 19-64 existing at below 185% of the Federal poverty level with no health or dental insurance. In addition, the U. S. Census Bureau (2011) showed the county poverty level at near 12%. Urbina (2007) showed Kentucky to be the,
state with the highest proportion of adults under 65 without teeth, where about 
half the population does not have dental insurance…[where] struggles to counter 
the effects of the drastic shortage of dentists in rural areas and oral hygiene habits 
that have been slow to change. (p. 1)

The Nelson County Community Clinic needs a mechanism to triage patients with dental needs. This would enable resources to be used effectively to meet the dental needs of this population. Furthermore, Brockelhurst, Ashley, Walsh, and Tickle (2012) stress the potential of screening in solving the problem, which is “inherent in the current system in the United Kingdom and other similar populations, where patients with the least need are seen and treated by the most expensive resource, whilst patients with the high levels of need have problems accessing dental services” (p. 240).

The purpose of this research is to measure the effect of implementing a screening process into the community clinic setting. The specific goal is to collect data that will provide, “a model that will ensure a balance between what is efficacious and what will address a community’s priorities and capacity…” (Layde et al., 2012, p. 617). Kettner et al. (2008) describe this as the process to “insure there is a good fit of service to need, so that service can be more precisely focused on getting the kind of results intended” (p. 10).

Research Question

Does implementing the screening process improve patient care for the community clinic?

Significance of the Study

The World Health Organization (2003) states, “Think globally – act locally” (Peterson, 2003, p.18). This statement provides the impetus for this study. Studies have consistently shown the full ramifications of the problem of access to dental care for the underserved. Moreover,
evidence has supported the fact that Community Clinics existing as safety-net providers have been striving to make a difference. The ASTDD (2010) identifies benefits to the current dental screening efforts focused on children and the elderly. This research could provide a screening program for the adult working poor population. The framework could be applied for other community clinics facing the same dilemma as limited resources threaten to decrease care for the patients served.

Through this research it is expected that if by assessment through the screening process is successful, then treatments could be tailored to specific needs and sufficient resources could be allotted as necessary. This could create an avenue to decrease wait times, increase services rendered, and increase effectiveness of patient care. This would also provide an avenue for prevention and a halt to progression of dental disease when possible. More specifically, resources could be allocated more efficiently in caring for the patients that the clinic serves. This could create an effective means of providing access to dental care for the working poor population. If proven successful, an effective adult survey system would be gained and could be replicated across the country. According to the World Oral Health Report (2003), “the major challenges of the future will be to translate knowledge and experiences of disease prevention into action programmes” (Peterson, 2003, p. 16). The purpose of this research is to promote action and to provide a path of access to dental care for the adult working poor population.

Delimitations and Limitations

A delimitation noted in this study was the relative small size of the community clinic where the screening process was implemented. Therefore, the sample size will be lower when compared to larger clinics. A further limitation has been identified by the parameters of the patient population of the clinic. The Nelson County Community Clinic treats working residents
of Nelson County aged 19 and 64 existing 185% below the federal poverty level without insurance. In addition, a further limitation has been noted in the exclusion of children, elderly, and pregnant women from the study.

Assumptions

It is assumed that because a licensed dental professional is performing the screening process, the screening will be done properly. It is also assumed that this professional possesses the knowledge and proper training to identify obvious dental needs. Additional training was provided to assure screener reliability and familiarization with survey and procedures.

Operational Definitions

Basic screening survey: According to the Association of State & Territorial Dental Directors (2012) it is composed of “two basic components: 1. Direct observation of a person’s mouth and [Optional] 2. Questions asked of, or about, the individual being screened” (p. 1). Classified as:

Urgent need for dental care: [Indicates patient is to be scheduled] as soon as possible. When [accompanied by] signs or symptoms that include pain, infection, or swelling.

Early dental care needed: [Patient is to be scheduled] within several weeks. [Indicated when] caries [cavity presents] without accompanying signs or symptoms or individuals with other oral health problems requiring care before their next routine dental visit.

No obvious problem: [Patient is to be scheduled for] next regular checkup. [This is indicated for] any patient without above problems. (Association of State and Territorial Dental Directors, 2012, p. 1)

Decay: The presence “of untreated decay [is indicated] when the screener can readily observe
breakdown of the enamel surface. In other words, only cavitated lesions are considered to be untreated decay” (Association of State & Territorial Dental Directors, 2012, p. 1).

**Dental examination:** Comprehensive clinical examination performed by licensed dentist with mirror, explorer and radiographs. This is considered the gold standard for diagnosis and results in full detailed treatment plan.

**Dental screening:** Process of reviewing health history using a mouth mirror and explorer or tongue depressor in order to complete the steps: identifying and charting decay, classifying condition of mouth in regard to gum tissue appearance, documentation of findings.

**Edentulism:** “Having all natural permanent teeth missing, including third molars” (Health and Human Resources, 2012, p. 1).

**Effectiveness:** “Refers to the achievement of client outcomes (quality of life changes) as a result of receiving services” (Kettner et al., 2008, p. 9).

**Efficiency:** “The ratio of outputs to inputs…how much service a program provides in relation to its costs” (Kettner et al., 2008, p. 9).

**Increase:** To move in a positive direction.

**Implementation:** The beginning process of putting a program to use.

**Oral Health:** “A state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay and tooth loss (Institute of Medicine of the National Academies, 2011a).

**Program:** “A prearranged set of activities designed to achieve a stated set of goals and objectives” (Kettner et al., 2008, p. 9).

**Safety-net clinics:** “Dental clinics [set up to] provide services to populations that are unable to purchase private sector care” (Bailit et al., 2006, p. 807).
Tooth retention: “Having all natural permanent teeth present, excluding third molars” (Health and Human Resources, 2012, p. 1).

Underserved: Those patients (populations) who lack resources or access to care.

Untreated dental caries: “Dental cavities that have not received appropriate treatment” (Health and Human Resources, 2012, p. 1).

Working poor: Person is in the working age group of 19-64 existing at 185% below federal poverty levels with no health or dental insurance. This population group does not qualify for federal aid programs.
CHAPTER 2
REVIEW OF THE LITERATURE

Oral Health

Satcher has issued a new statement against oral disease. He stated, “It is time to get serious and pursue the framework for action that I set forth in my 2000 report [Silent Epidemic]. All health professionals need to understand that good oral health means more than sound teeth” (Satcher, 2012, p. 1). Furthermore, he reiterated the link between oral health and systemic health. “The mouth is really a window to the whole body. Oral health affects everything from the ability to speak, eat or smile. Poor oral health is linked to heart disease, stroke and other long-term illness” (Satcher, 2012, p. 1).

The Centers for Disease Control (2011) agreed with Satcher and wrote, “Oral health is an essential part of our everyday lives…oral diseases, which range from cavities to oral cancer, cause pain and disability for millions of Americans each year” (p. 2). Watt (2005) cited the names of oral diseases and the subsequent effects they have on patients:

…dental caries, periodontal diseases, oral cancers, noma, dental erosion and dental fluorosis. Oral diseases are highly prevalent and their impact on both society and the individual is significant. Pain, discomfort, sleepless nights, limitation in eating function leading to poor nutrition, and time off school or work as a result of dental problems are all common effects of oral diseases. (p. 711)

In addition, diseases of the gum tissue caused by bacterial infections that destroy surrounding bone and gum tissue have been definitely linked to systemic health (CDC, 2011). Moreover, according to the CDC (2011) “more than 7,800 people, mostly older Americans, die
from oral and pharyngeal cancers each year [the estimate for 2011 was] about 36,500 new cases of oral cancer will be diagnosed” (p. 2).

The fact that dental disease is preventable has not been shown to translate into access to the preventive services. Disparities due to racial, ethnic, and socioeconomic status exist. In fact, “tooth decay is a common, preventable problem for people of all ages…adults and children of some racial and ethnic groups experience more untreated decay” (CDC, 2011, p. 2). The Kaiser Commission (2011) reported that, “nearly 48 million nonelderly Americans were uninsured in 2011…[they further stated]…individuals below poverty are at the highest risk of being uninsured” (p. 1).

In performing this literature review, my intent was to seek peer reviewed articles and relevant literature. Databases of the Sherrod Library were searched including CINAHL, Google Scholar, and Wiley Online Library. State agencies were also searched for information on existing programs. Key words used were safety net, screening, access to care, history of dental hygiene, role of dental hygiene, effectiveness of screening, and oral cancer.

*The Safety Net*

O’Connor (2012) showed the downturn of the economy having an effect on the population. They stated, “In 2010 in Florida, the number of Medicaid enrolled residents who sought care at a hospital emergency room for dental reasons jumped 40 percent from two years earlier” (O’Connor, 2012, p. 1). The Caridad Center in Florida is a safety net dental clinic that has focused on the oral health of children. O’Connor reported progress,

But even as the dentists begin to get the children past the cavity-filling stage and heading toward twice-a year checkups, the situation gets worse. Now they have a new constituency: people who have lost their jobs and insurance and are coming
into the Caridad clinic with broken teeth, untreated dental infections and other urgent needs” (p. 1)

The Kaiser Commission (2011) further explained the lack of preventive care and screenings seen in the uninsured population has resulted in subsequent serious conditions that could have been averted.

Melanson (2008) described the plight of the uninsured, “When individuals suffering from debilitating dental pain do not have money to access private fee-for-service dental treatment, they are left with trying to deal with the symptoms” (p. 187). This author described the process of setting up a clinic for the underserved population. The purpose of the article was to provide a guide for future clinics to emulate. A strength noted by this researcher was the author’s challenge to the assumption that public funds were sufficient for dental coverage for the poor and disadvantaged. Furthermore, the authors showed that even when coverage is extended, the costs are found to compete with necessities such as food and shelter. The authors listed three main program approaches to developing programs of low or no cost treatment: referral to private dental offices, mobile clinics, or fixed location clinics (Melanson, 2008). The author made a compelling argument for the case of adding dental clinics to current medical outreach clinics. In addition, the author made a valid point regarding the lack of data in regard to the cost of the access to dental care issue to the U. S. healthcare system. The author made a convincing call for dental professionals to be involved in the planning stages of safety-net clinics.

Beazoglou et al. (2005) explained the role of the safety net dental clinics. The authors stated, Although the safety net plays an important role in providing care to low-income and other disadvantaged groups, it has limited capacity relative to the size of the underserved population…estimates of the size and capacity of the safety net are
based on ‘order-of-magnitude guesses’ rather than on the primary collection of data at the state level (Beazoglou et al., 2005, p. 1457).

The lack of concrete data was noted in the research from Beazoglou et al. (2005). However, the need for specific data has been noted throughout oral care programs. The need for data has shown to be especially significant for community dental programs that do not qualify for federal assistance (Beazogluo et al., 2005).

The CDC has provided support for data collection programs such as the, “Association of State and Territorial Dental Directors to guide states on oral health issues, improve state oral health program standards, and help states develop the expertise to assess oral health needs and conduct effective prevention programs” (2011, p. 3). This work has shown to ensure the “public has the information needed to achieve optimal oral health throughout a lifespan” (CDC, 2011, p. 3). Specifically, the CDC has a goal of helping “collect, interpret, and share oral health data specific to their areas…use the data to monitor their progress in meeting Healthy People 2020 goals for oral health, target limited resources to people with the greatest needs, and compare their oral health problems with those of other states and the nation” (2011, p. 3). These data collection programs have primarily focused on children and elderly. However, the CDC has shown support for state and local community efforts to promote oral health for adults.

“In 2009, Health Resources and Services Administration and the California Health Care Foundation asked the Institute of Medicine (IOM) and the National Research Council (NRC) to convene a committee of experts to address access to oral health care for vulnerable and underserved populations” (Institute of Medicine of the National Academies, 2011, p. 1). In addition, the “committee identified a deficiency in the collection, analysis, and use of data related to oral health” (IOM, 2011, p. 1). Bailit et al. (2006) explained that “because of
inadequate data, a precise estimate [of the capacity of the dental safety net system] is not possible…” This process was explained by Kettner et al. (2008) in regard to effectiveness-based planning. These authors recommended “periodic checkups to determine their continuing effectiveness and relevance in a changing environment” (Kettner et al., 2008, p. 10). In fact, Kim has spoken of the lack of data regarding interventions. He stated:

Well, I’ve noticed over the years that when it comes to our most cherished social goals, not only do we tolerate poor execution, sometimes we celebrate poor execution. Sometimes it’s part of the culture. You know, these folks are trying to solve this terrible problem. They can’t keep the books straight. They really don’t know what they are getting. They don’t measure anything. But they’re on the right side, so that’s okay. I think we’re in a different time. (Kim, 2009, p. 3)

*Role of the Patient*

The use of the Health Belief Model (HBM) which “provides the theoretical foundation for socioeconomic, cultural, and environmental factors that guide people in the process of seeking, initiating, and obtaining dental services” (Flaer, Younis, Benjamin, & Al Hajeri, 2010, p. 103). Flaer et al. (2010) explained, [In the Health Belief Model (HBM)], “behavior change is predicted on the patient’s belief in susceptibility to dental disease, perception of the potential seriousness of dental disease in terms of discomfort, economic effects, and the presence of a ‘cue to action’ (e.g., oral pain, infection, or social pressure to repair cosmetics)” (p. 106). The authors applied the theory to factors of dental treatment and the underserved population. It was concluded that “people who perceived their health status as ‘good’ were significantly more likely to see the dentist than those perceiving their health as ‘poor’” (Flaer et al., 2010, p. 105). However, Broder et al. (2003) cautioned against using the Health Belief Model as the sole basis of theory. They
instead offered advice and further stated that this model has been shown to provide a stable “foundation for subsequent models and is associated with specific health behaviors” (Broder et al., 2003, p. 110).

While there are many attempts to solve the access to care problem, Guay (2004) warned of a limited viewpoint of options. “The problem of inadequate access to dental care for some segments of the population is complex and cannot be solved simply…the ‘one size fits all’ concept will generate inadequate solutions” (Guay, 2004, p. 1599). The factors that are external to the patient were noted as, “adequacy of the dental work force and ability to pay for care—were the primary determinants of access” (Guay, 2004, p. 1599). Furthermore, Guay stated that these factors were based mainly on economics or supply. This same author showed a slant toward consideration of external factors such as the patient’s perception of a need for care, influences of culture, dialect, etc. This same author further stated that these factors were to be patient-based, related to demand for dental care, but not related to the availability of care. Groups identified as having difficulty in accessing dental care were listed, “poor and working poor, poor inner-city residents, rural area residents, mobility-restricted people, culturally isolated groups, unemployed, uninsured, special needs populations, and Native Americans and Alaska natives” (Guay, 2004, pp. 1603-1604). This author explained that the lack of insurance does not always lead to lack of access to dental care. He stated, “The effects of not having dental insurance are not uniform across the socioeconomic spectrum, being more of a burden on the lower end” (Guay, 2004, p. 1602). Guay stressed the need for consideration of the demand for care, an appropriate workforce to meet that demand, and an economically supportive setting for both the patients and the providers of services. The author further explained how common answers to the access to problem issue will not be sufficient to solve the problem. An example given was the
call to increase the number of dentists; this was shown not to be effective because of the
tendency for dentists to practice in higher socioeconomic areas that would not address the current
need (Guay, 2004). Another common suggestion has been to provide dental benefits to Medicare.
Guay explained that to be Medicare entitled has not been equated to solving the access to dental
care. Moreover, “global eligibility would divert scarce resources to some who have no difficulty
in acquiring adequate care” (Guay, 2004, p. 1604). Screening for needs has been shown to be an
effective method in the triage of patients and conservation of resources.

The sheer number of underserved patients presenting for treatment has produced problems
to be solved. “In public health services and health maintenance organizations, such as military
health services the demand for health care often exceeds the immediate service rendering
capability” (Postma, 2007, p. 1287). In addition, Postma (2007) explained that “long waiting lists
may also contribute to deterioration in clinical status before intervention eventually takes place”
(p. 1287). Postma performed a study to examine the effects of a screening tool to predict the
presence of periodontal disease and cavities. The methodology of a questionnaire regarding
tobacco habits and self-rated oral health was administered to incoming patients. The results were
that self-rated health when used in conjunction with questions about tobacco use showed promise
for use in dental screening. Poorer self-rated health and tobacco use was associated with a history
of tooth loss, increased levels of decay, and periodontal disease (Postma, 2007). The author
stated that previous research had shown a higher number of oral health problems associated with
tobacco use. This fact has been well documented in oral health literature. This author further
stated that this research showed, “evidence of clinical associations with self-rated oral health of
dentate adults demanding routine dental care at the entry point of an institutional dental care
system (Postma, 2007, p. 1291).
Watt and Peterson (2012) advocated for a public health approach to periodontal disease. The authors argued against the ability of a single practitioner approach to solving this disease. They further argued that the magnitude of the number of people worldwide affected by this disease requires a shift from the traditional view of dentistry. Moreover, they further stated, “to be effective, population preventive measures need to address the underlying causes of disease, the recognized risk factors [identified as smoking and alcohol]” (Watt & Peterson, 2012, p. 149).

However, they cautioned that the profession must look beyond these traditional factors. The authors called for a more community based approach to be undertaken. “At a clinical level, dental professionals need to have an understanding of the social determinants agenda to ensure that they appreciate the broader policy picture and the limitation of what can be achieved on a one-to-one basis with their patients” (Watt & Peterson, 2012, p. 153). Watt and Peterson (2012, p. 153) further stated,

In contrast, dental public health practitioners have a significant role to play in promoting periodontal health at a population level. [Furthermore] acting as an oral health advocate ensuring that oral health issues are included in other areas of public health action is a very important role. Public health professionals can also be involved in program planning, implementation and evaluation.

Looking beyond the risk factors was the intention when Muirhead (2009) surveyed the working poor of Canada to identify factors hindering this population from accessing dental care. The questionnaire that they implemented contained socioeconomic questions, competing demands on the patient’s finances, self-rating of oral health as well as inquiries of insurance and dental access behaviors (Muirhead, 2009). A sample size of 1,049 participants was attained. However, this research could have been expanded if cell phones were included in addition to
landlines as the choice of contact. This research included findings of reports in difficulty accessing dental care due to finances. In addition, these authors found almost a fourth of the participants identified as food insecure (Muirhead, 2009). A large number of oral health problems were also identified by these participants. Muirhead surmised that this could be due to the lack of finances which equals “cheap, energy dense and low variety diets containing large amounts of added sugars and few dairy products, fruits and vegetables; diets that increase the risk of dental caries” (p. 301). The authors correctly identified a significant limitation in the lack of clinical data to accompany the patients reported conditions.

The role of socioeconomic conditions has been proven through data to have an impact on oral health and access to care. When Polk, Weyent, and Manz (2009) conducted a screening assessment of adolescents in Pennsylvania, the objective was to identify if any link existed between level of socioeconomics and dental decay. In addition, the authors wanted to discern whether oral hygiene behavior and prevention techniques altered this occurrence (Weyent et al., 2009). The visual basic screenings were performed by a hygienist using a dental index and questionnaires for both the adolescents and their parents regarding their oral health perceptions, oral hygiene habits, dental insurance, access to care, and history of fluoridation of water or other preventive modalities (Weyent et al., 2009). The authors further stated that the results supported a link between socioeconomics and experiences of dental decay. However, the research found “disparities in caries experience…cannot be accounted for by SES-associated differences in brushing, flossing, sealant use, fluoride exposure, or recent use of dental services” (Weyent et al., 2009, p. 1). The author listed limitations in findings by calling for more research. These authors further explained how bias could have entered the study and the limitations of their cross-
sectional method of research. The lessons learned from this research seemed to conclude that the disparities associated with access to care extend beyond the clinical preventive approach.

Weintraub (2012) advocated for, “tailored, community-driven approaches” (p. 1). This same author further stated, “programs that meet customer needs, built trust, are evidence-based, efficient, accountable and supported by oral health professionals and larger organizational systems are likely to be sustained” (2012, p. 1). Watt (2005) noted the improvement in oral health over the last 3 decades. However, this same author further stressed, “oral health inequities have merged as a major public health challenge” (Watt, 2005, p. 711). The need was stated to be, “a range of complementary actions delivered in partnership with relevant agencies and the local community are needed” (Watt, 2005, p. 716). Monajem (2006) described the traditional role of dentistry and the need for a “stronger commitment to prevention—thus minimizing invasive-clinical interventions, and a ‘social and behavioural’, rather than technical orientation” (p. 49). Moreover, “rather than focus on toothbrushing behaviors alone in a very narrow and limited sense, action to promote periodontal health need to tackle the broader social determinants of hygiene practices…” (Watt & Peterson, 2012, p. 150). The role of dental hygienists beyond the traditional clinical domain has been long established.

Role of the Dental Hygienist

The purpose of dental hygienists in the role of prevention of dental disease has been taught in dental hygiene programs for years. In fact, “Dr. Alfred Fones, the founder of dental hygiene actually emphasized the use of dental hygienist as outreach workers in the public health setting” (Nathe, 2003, p. 98). The American Board of Dental Public Health (2007, p.1) declared:

Dental public health is the science and art of preventing and controlling dental diseases and promoting dental health through organized community efforts. It is
that form of dental practice that serves the community as a patient rather than the individual. It is concerned with the dental health education of the public, with applied dental research, and with the administration of group dental care programs, as well as the prevention and control of dental diseases on a community basis.

The use of dental hygienist to combat oral disease in the community environment has been established. Screening for oral disease in order to identify needs and direct appropriate resources has been shown to be effective. Thompson and Boyer (2006) cited advantages to visual screenings as, “low cost in terms of equipment, preparation, clean up, and manpower” (p. 8). Thompson and Boyer stressed, “dental hygienists have a long history of providing oral health screenings in community settings…” (p. 1). The authors cited a 1929 book that stated, “She [dental hygienist] makes thorough and detailed mouth examinations and records the needs of each individual” Wood and Rowell (as cited in Thompson & Boyer, 2006, p. 2). The use of dental hygienists as effective screeners has been questioned. The opposing argument has been to only use dentists. However, Thompson and Boyer conducted a study that showed dental hygienists as effective in this role. Moreover, they “demonstrated high specificity, and moderate sensitivity for caries [cavities] identification” (p. 1). Thompson and Boyer explained the importance of a team effort to provide the screenings. The authors further noted that while most hygienists prefer to use the American Dental Association’s Type 4 examination, “using tongue depressor, available illumination [to complete a visual dental hygiene screening]… dentists typically use type 3, a mirror, tactile dental inspection” (Thompson & Boyer, 2006, p. 2). The authors of the study explained that they incorporated training and inter-examiner skills calibration before initiation of screening. The “criteria of measurement…were based on the
National Institutes of Health epidemiological protocols…[and] were the standard of validity” (Thompson & Boyer, 2006, p. 3). Two hygienists and one local dentist participated as screeners. The goals were to examine validity of visual screening against the gold standard of the dentist using tactile dental inspection. While the use of dentists with equipment for tactile examination with mirrors and explorers was considered ideal, validity of dental hygienists as screeners was established. The advantages of visual screenings were listed by Thompson and Boyer as, “low cost in terms of equipment, preparation, clean-up, and manpower. This study ascertained that child contact time for one dentist to perform the [tactile] MTDI was more than twice that for one dental hygienist to perform the [visual] VDHS” (2006, p. 8). The results of this study would best be stated as having helped prove the validity of health professionals to provide a team effort toward screening.

The use of screening has been implemented by the Association of State & Territorial Dental Directors. The process was defined to clearly differentiate screening versus complete exam,

Screening is not a thorough clinical examination and does not involve making a clinical diagnosis resulting in a treatment plan. A screening is intended to identify gross dental or oral lesions, an is conducted by dentists, dental hygienists, and other appropriate health care workers, in accordance with applicable state law. The information gathered through a screening survey is at a level consistent with monitoring the national health objectives found in the United States Public Health Service’s Healthy People document. Surveys are cross sectional (looking at a population at a point in time), and descriptive intended for determining estimates
of oral health status for a defined population. (Association of State & Territorial Dental Directors, 2012, p. 1)

The BSS model (basic screening survey) has two basic components of direct observation and questionnaire. “The direct observation portion of the model is required while the questionnaire portion is optional” (Association of State & Territorial Dental Directors, 2012, p. 1). The presence “of untreated decay [is indicated] when the screener can readily observe breakdown of the enamel surface. In other words, only cavitated lesions are considered to be untreated decay” (Association of State & Territorial Dental Directors, 2012, p. 1). The findings are further categorized as,

*Urgent need for dental care*: [Indicates patient is to be scheduled] as soon as possible. When [accompanied by] signs or symptoms that include pain, infection, or swelling.

*Early dental care needed*: [Patient is to be scheduled] within several weeks. [Indicated when] caries [cavity presents] without accompanying signs or symptoms or individuals with other oral health problems requiring care before their next routine dental visit.

*No obvious problem*: [Patient is to be scheduled for] next regular checkup. [This is indicated for] any patient without above problems (Association of State and Territorial Dental Directors, 2012, p. 1).

The process of screening was further described by Brockelhurst et al. (2012) as,

…analytically distinct from an examination, as its purpose is to simply determine the probable presence or absence of disease, not to record or detail the condition
to enable a diagnosis to be formulated, pursuant to the skill of a trained dentist (p. 240).

The authors performed a study to discern the ability of adjunct dental personnel to screen oral disease against the gold standard of dentists. The argument was that if adjuncts could perform screenings, it could lighten the clinical load on dentists, allow more of the urgent needs of the underserved to be treated, and conserve resources. The results indicated that while dentists rated most excellent in rating oral disease, the use of adjuncts was supported through the data. Critics stated that visualizing only the occlusal (chewing) surfaces of the teeth were not sufficient in predicting decay. The authors stressed that it should be noted, “screening is not the same as diagnosis or treatment planning which requires substantial training and the development of clinical reasoning, pursuant to a qualified dentist” (Brockelhurst et al., 2012, p. 244).

*Solutions in Screenings*

Postma (2007) described screening as useful in prioritizing treatment. Brockelhurst et al. (2012) have predicted the benefits of screening to produce a “cost savings or the reallocation of resources to reduce dental health inequalities, given that many patients who attend their dentist on a regular basis do not require any active treatment” (p. 240). Furthermore,

Screening has the potential to reduce the problem inherent in the current system in the United Kingdom and other similar populations, where patients with the least need are seen and treated by the most expensive resource, whilst patients with the high levels of need have problems accessing dental services. (Brockelhurst et al., 2012, p. 240)
Newecheck, Hughes, Hung, Wong, and Stoddard (2000) stated, “Unmet need for dental care was the most prevalent form of unmet need” (p.990). Moreover, these researchers called for an innovative approach which would place health professionals “to directly ascertain unmet need through clinical examination”(Newecheck et al., 2000, p. 994). Davis et al. (2010) cited these researchers as they took a unique approach to train physicians in Oregon to screen for oral needs. The physicians had expressed interest in participating in the program, “to confirm their impression that many patients present to their practices with dental health issues. In addition, local community leaders…sought baseline data regarding unmet dental needs to determine how to best address this local health concern” (Davis et al., 2010, p. 515). The physicians were trained by a local dentist and dental school faculty to perform basic oral screenings. In addition to the screenings, the patients were given a survey to attain questions regarding access, patterns of oral health care, and unmet oral health needs as reported by the patients (Davis et al., 2010). The physicians reported appreciation for being able to, “quantify their patients’ unmet dental needs. Many commented that this study helped them realize how often oral health is overlooked in primary care and that the training improved their ability to conduct oral health exams” (Davis et al., 2010, p. 520). The study encompassed a range of ages from children to elderly patients.

Data from the research indicated a need for attention to dental care for all ages and “should not be limited to pediatric or geriatric patients because conditions appear among patients across all ages” (Davis et al., 2010, p. 520). Griffin et al. (2012) stated, “There is also evidence that those on highest need are the least likely to receive care” (p. 412). In addition, it was stated:

Disparities in untreated dental disease for the 2 primary causes of tooth loss—caries and periodontal disease—were typically highest in persons aged 50 to 64
years… Poor persons in this age group were about twice as likely to have a cavity that needs treatment… (Griffin et al., 2012, p. 415)

The authors further called for the provision of a safety net dental clinics to have “oral assessments as the basis for individualized care plans that address provision of preventive care by trained person personnel, and have access to restorative services when appropriate” (Griffin et al., 2012, p. 417).

Dr. Ana Zea’s program for Refugee Oral Health was highlighted in an Agency for Health Care Innovations Exchange (AHRQ) innovation profile. The intent was to provide “screenings, referrals or urgent and preventive care, culturally appropriate education and training for medical practitioners on incorporating culturally sensitive oral health screening into medical examinations” (AHRQ, 2009, p. 1). This program was shown to be successful and was focused on children who were “refugees and asylum seekers in Massachusetts” (AHRQ, 2009, p. 1). Many of these children had never been treated in the dental realm prior to this intervention. The white refugee children were stated to have almost 10 times the rate of decay as a child in America. The black refugee children fared slightly better though still were affected by dental decay at twice the rate as an American child. Barriers to care were identified as socioeconomic, cultural, and lack of familiarity with medical procedures resulting in fear (AHRQ, 2009, p. 1).

Dental screening was explained as,

The dentist uses a penlight, disposable gloves, disposable mouth mirror, and sterile gauze, to inspect all four quadrants of the patient’s mouth, looking for loose, missing, or broken teeth; fillings; signs of poor oral hygiene; and tooth pain and sensitivity. The dentist also performs an extra-oral exam, looking at the lips, neck, and jaw for any abnormalities. Using this information, the dentist triages the
patient, determining the need for urgent or routine followup care...[The patient was given] personalized oral health education and a demonstration of how to care for his or her teeth... Patients are also given toothbrushes, toothpaste, and floss samples to take home. (AHRQ, 2009, p. 1)

In addition to the prevention of dental disease, screening for oral cancer has shown to be effective, efficient, and of high importance. Subramanian et al. (2009) explained that oral cancer has been shown to be prevalent both globally and in the United States. Research has proven that this problem has grown significantly. The Oral Cancer Foundation stated,

Approximately 40,000 people in the US will be newly diagnosed with oral cancer in 2012. This includes those cancers that occur in the mouth itself, in the very back of the mouth known as the oropharynx, and on the exterior lip of the mouth. This is the fifth year in a row in which there has been an increase in the rate of occurrence of oral cancers, in 2007 there was a major jump of over 11% in that single year...While some think this is a rare cancer, mouth cancer will be newly diagnosed in about 100 new individuals each day in the US alone, and a person dies from oral cancer every hour of every day. If you add the sub category of laryngeal throat cancers, the rates of occurrence (about 12,000 additional new cases per year) and death are significantly higher. When found at early stages of development, oral cancers have an 80 to 90 % survival rate. (2012, p. 1)

In addition, Subramanian et al. (2009) listed alcohol and tobacco as risk factors. The research completed by the authors identified diagnostic testing as the gold standard method. However, visual screening was shown to be effective. “The most cost-effective approach, as indicated by the cost per life-year saved, is to establish a screening programme for tobacco and alcohol users
aged 35 years and above” (Subramanian et al., 2009). In comparing costs through research, the authors found diagnostic screening to cost almost $95,000 US dollars. In contrast, visual screening costs were almost half (Subramanian, 2009). The authors further indicated that the visual screening could be performed every 3 years and be conducted by dentists or other health care professionals.

Summary

The studies that have been cited throughout this review have proven that screening can assist to promote efficiency and effectiveness in community clinic settings. The need for more data specific to the volunteer safety-net setting has been shown to be essential. The literature clearly showed support for screening to triage care. Methods used were often a combination of dental indices and self-rated oral health questionnaires. Furthermore, the review has provided a template to follow for “identifying local priorities, finding relevant, evidence-based interventions from the literature that would be feasible and acceptable within the community” (Layde et al., 2009, p. 623). By combining the lessons learned through these examples, “the knowledge gleaned from this research is used to develop policies and practices that improve health outcomes and performance as well as allow for more efficient use of resources” (Layde et al., 2009, p. 617).
CHAPTER 3

METHODOLOGY

Overview

The ADHA (2001) cited the lack of finances as the most prevalent barrier to dental care. As stated in the 2003 World Health Report, “traditional treatment of oral disease is extremely costly, the fourth most expensive disease to treat in most industrialized countries…the greatest burden of all diseases is on the disadvantaged and socially marginalized” (Peterson, 2003, p. 9). More importantly, Harrington and Estes (2008) showed, “adults are disproportionately represented and constitute the large majority, with those 18 to 44 years old making up roughly 60% of the uninsured” (p. 89). Therefore, “To address the dental care access problem, public and voluntary sector organizations have developed dental clinics to provide services to populations that are unable to purchase private sector care…[referred to as the] ‘safety net’” (Bailet et al., 2005, p. 807). According to O’Connor (2012) these clinics are providing care for almost a fourth of the patients in need. However, resources are limited and innovative methods to efficiently care for patients are needed in order to effectively address the access to care issue.

The purpose of this research was to measure the effect of implementing a screening process into the community clinic setting. Studies have consistently shown the full ramifications of the problem of access to dental care for the underserved. Moreover, evidence has supported the fact that Community Clinics existing as safety-net providers have been striving to make a difference. Research has shown benefits to the current dental screening efforts focused on children and elderly. This research has been initiated in order to assess the feasibility of providing a screening program to the adult working poor population. The Nelson County Community Clinic has shown a need for a mechanism to triage patients with dental needs. The framework has shown the
potential to be applied to other community clinics facing the same dilemma as limited resources threaten to decrease care for the patients served.

Population

The population of this study included patients from the Nelson County Community Clinic in Bardstown, KY. The patients included in the study’s population would be characterized as a nonprobability convenience sample. Permission to perform the study in this clinical setting was granted by the Director, Jan Tronzo. The permission form has been attached as Appendix A.

The Nelson County Community Clinic opened in 2006 and provides dental services to residents of the county who are in the working age group of 19-64 existing at 185% below federal poverty levels with no health or dental insurance. The mission statement was reported, “To provide basic medical and dental care to the working uninsured residents of Nelson County who meet the income guidelines which will result in a healthier community and decrease the morbidity and mortality rate in our community” Jan Tronzo (personal communication, October 29, 2012). In addition, the U. S. Census Bureau (2010) showed the county poverty level at near 12%. Moreover, Kentucky has been shown to be the state with the highest proportion of adults under 65 without teeth, where about half the population does not have dental insurance…[where] struggles to counter the effects of the drastic shortage of dentists in rural areas and oral hygiene habits that have been slow to change. (Urbina, 2007, p. 1)

In addition, risk factors for dental problems and oral cancer have shown to be high in Nelson County, KY. According to the county health rankings, 30% of the population use tobacco and are obese, and almost 20% of the residents drink alcohol (University of Wisconsin, 2012, p. 1). The goal of the clinic has been stated to meet the medical and dental needs of the patient population.
Participants of this study were residents of Nelson county aged 19 to 64 who were working but lacked medical or dental insurance. Children under the age of 19, pregnant women, and those aged above 64 were excluded from this study.

Informed Consent Consideration

All participants of this study were given a written information form explaining the purpose of the research and a separate form for obtaining informed consent. The Association of State Territorial Dental Directors has stated, “If the participant is a competent adult, they can give verbal consent and do not need to sign a consent form for a non-invasive dental screening” (2010, p. 24). However, basic consent forms were constructed (Appendix B). The IRB stamped and approved the document on April 5, 2013. The researcher requested the patients sign the informed consent before the screening procedure was initiated. In addition, the researcher was available onsite to answer any questions. Patients were given the choice to opt out of the screening process research without penalty.

Research Design

A cross-sectional quantitative study design provided the basis for this research. Cottrell and McKenzie (2011) noted this as a “One-Group Pretest-Posttest Design” (p. 185). The setting was a nonprobability convenience sample of patients at the Nelson County Community Clinic. Cottrell & McKenzie (2011) explained, “[Participants are] drawn by selecting any available participant from an intact group” (p. 133). The authors further explained that this has often been used in situations where resources of time and money have been limited. These were used specifically in this research due to the ability to reach a large number of participants for the screening. The pretest consisted of collecting baseline data before onset of the pilot study. These data were compared to data after the pilot study, which was considered posttest.
The Association of State Territorial Dental Directors method of visual screening and classifying dental needs was incorporated in this design. The survey tool has been attached as Appendix C. Verbal consent was granted for use of the survey method from McKee (Kentucky State Dental Director) and the designer of the instrument Kathy Phipps (personal communication, 11-9-12). In addition, the older adult survey design kit was purchased at the ASTDD website and is available for public use (ASTDD, 2012).

Patient privacy was assured by the use of separate treatment rooms. Confidentiality was further ensured by coding the screening forms with numbers. Confidentiality has been further defined by Cottrell and McKenzie (2011) as data linked to patient, but information would not be shown through research. Patient charts could be matched to the screening forms by number to assist in scheduling identified dental treatment needs.

All documents and recorded information were treated in accordance to applicable laws and regulations (HIPPA). Screening form data sheets were coded by number and entered on a password protected laptop. This was kept with researcher at all times throughout the study. Cottrell and McKenzie (2011) advised keeping data with researcher at all times. East Tennessee State University Institutional Review Board (IRB) approval was requested and granted before initiation of the screening process. Approval was granted on April 5, 2013, as study 0213.27s (Appendix D).

**Research Question**

A single question guided this research, “Does implementing the screening process improve patient care for the community clinic?” The data necessary to answer this question were: total number of patients screened, conditions by category, separation by age groups, separation by gender, and the number of patients on waiting lists before and after program implementation.
Through this research it was expected that if assessment using the screening process proved successful, treatments could be tailored to patient specific needs and sufficient resources could be allotted as necessary. This could lead to decreased wait times, increased services rendered, and increased effectiveness of patient care.

*Survey Instrument*

The Association of State & Territorial Dental Directors survey was the choice for the screening instrument. The BSS model (basic screening survey) has incorporated two basic components: direct observation and questionnaire. “The direct observation portion of the model is required while the questionnaire portion is optional” (Association of State & Territorial Dental Directors, 2012, p. 1). The direct observation portion consisting of a visual screening of patient needs was chosen. The questionnaire portion was not identified as part of this study.

More importantly, it must be stressed that this instrument was not designed for diagnostic purposes. Therefore, it should be stated the presence “of untreated decay [is indicated] when the screener can readily observe breakdown of the enamel surface. In other words, only cavitated lesions are considered to be untreated decay” (Association of State & Territorial Dental Directors, 2012, p. 1). For the purpose of triaging dental needs through screenings, the findings were further categorized as:

*Urgent need for dental care:* [Indicates patient is to be scheduled] as soon as possible. When [accompanied by] signs or symptoms that include pain, infection, or swelling.

*Early dental care needed:* [Patient is to be scheduled] within several weeks. [Indicated when] caries [cavity presents] without accompanying signs or
symptoms or individuals with other oral health problems requiring care before their next routine dental visit.

No obvious problem: [Patient is to be scheduled for] next regular checkup. [This is indicated for] any patient without above problems (Association of State and Territorial Dental Directors, 2012, p. 1).

Instrument Validity

Proving the validity of an instrument has been described as essential in assuring measurement of what is intended to measure (McKenzie & Cottrell, 2011). The instrument was tested for validity by Beltran et al. (1997) and showed, “highest validity for caries and urgent treatment” (p. 211). Following evaluation of the reliability and validity of this Basic Screening Survey, the project culminated in ASTDD's 1999 publication of a manual, with data entry and analysis programs as well as a training video. Further proof of reliability and validity of the survey has been reported (as cited in Malvitz, Barker, & Phipps, 2009, p. 2). Moreover, the tool has been implemented by the Association of State and Territorial Dental Directors for measuring oral health data.

Reliability of Screener

The ASTDD provided a training video and a manual with pictures and scenarios that were reviewed for training. A licensed hygienist was implemented as the screener. Hygienists are dental professionals and have been extensively trained and regarded as experts in assessing oral health needs. As Thompson and Boyer (2006) stated, “dental hygienists have a long history of providing oral health screenings in community settings…” (p. 1). Thompson and Boyer (2006) performed research to examine validity of visual screening against the gold standard of the dentist using tactile dental inspection. While the use of dentist with equipment for tactile
examination with mirrors and explorers was considered ideal, validity of dental hygienists as screeners was established. This has been shown to support and alleviate the dentist workload and supplement patient care. Moreover, screening has been shown to conserve resources of staff, finances, and time.

*Pilot Study*

After sufficient training was performed and official approval was received, a pilot study was performed for a 6-week period to test the screening process. The cover letter for the pilot studies has been attached as Appendix E. “Pilot studies are designed on a small scale with the intent to determine if there are any positive results that would justify further study” (Cottrell & McKenzie, 2011, p. 185). Postdata were accrued and assessed for effectiveness before full implementation of the program. The decision was made at that time to continue or discontinue the screening program.

*Strengths and Limitations of Data Collection Instrument*

The ASTDD (2010) manual cautioned, “Before embarking on a screening survey, it is important to understand its limitations. A dental screening is not a thorough clinical examination and does not involve making a clinical diagnosis resulting in a treatment plan” (p. 2). The instrument’s lack of specific numerical scoring of disease levels has been recognized as a limitation. The simplicity of the instrument design and lack of instrumentation has been noted as both a strength and weakness. As previously noted, a full examination by a licensed dentist using an explorer and subsequent radiographs, has been acknowledged as the gold standard. However, as described by Brocklehurst et al. (2012), “[Screening is] analytically distinct from an examination, as its purpose is to simply determine the probably presence or absence of disease, not to record or detail the condition to enable a diagnosis to be formulated, pursuant to the skill
of a trained dentist” (p. 240). However, this design minimizes the use of resources such as time, staff, and materials. In addition, Postma (2007) further explained the maximizing of resources toward patient care due to the efficiency of screening.

**Data Collection Procedures**

The screening sessions (3 hour time blocks) were held twice weekly for a period of 6 weeks. As explained by the AHRQ (2009) article, the procedure for screening was implemented. This process was followed as described,

[After signed consent was received], the…[hygienist] uses a penlight, disposable gloves, disposable mouth mirror, and sterile gauze, to inspect all four quadrants of the patient’s mouth, looking for loose, missing, or broken teeth; fillings; signs of poor oral hygiene; and tooth pain and sensitivity. The [hygienist]…also performs an extra-oral exam, looking at the lips, neck, and jaw for any abnormalities. Using this information, the [hygienist]…triages the patient, determining the need for urgent or routine followup care…[The patient was given] personalized oral health education and a demonstration of how to care for his or her teeth…Patients are also given toothbrushes, toothpaste, and floss samples to take home. (AHRQ, 2009, p. 1)

The ASTDD oral health screening form was the collection method for visual findings. The form consisted of codes to identify screener, demographics, race, ethnicity, and visual findings. The screening form information was nominal data. This process of coding the yes and no responses by number was explained in Cottrell and McKenzie (2011). Conditions were noted as:

Verbally asked the patient:

Do you have a removable upper denture? 0= No, 1=Yes
Do you have a removable lower denture? 0=No, 1=Yes
Do you usually wear your upper denture when you eat? 0=No, 1=Yes
Do you usually wear your lower denture when you eat? 0=No, 1=Yes
Visually examined:
Substantial oral debris? 0=No, 1=Yes, 9=Edentulous
Severe gingival inflammation? 0=No, 1=Yes, 9=Edentulous
Number of upper natural teeth (Choose 0-16) including root fragments
Number of lower natural teeth (Choose 0-16) including root fragments
Untreated decay 0=No, 1=Yes, 9=Edentulous
Root fragments? 0=No, 1=Yes, 9=Edentulous
Need for periodontal care? 0=No, 1=Yes, 9=Edentulous
Suspicious soft tissue lesion? 0=No, 1=Yes
Treatment urgency was rated: 0=No obvious problem, 1=Early care (within next several weeks), 2=Urgent care (within next week-pain or infection)

The use of screening has been implemented by the Association of State & Territorial Dental Directors. The advantages of visual screenings were listed by Thompson and Boyer as, “low cost in terms of equipment, preparation, clean-up, and manpower. This study ascertained that child contact time for one dentist to perform the [tactile] MTDI was more than twice that for one dental hygienist to perform the [visual] VDHS” (2006, p. 8). The process was defined to clearly differentiate screening versus complete exam,

Screening is not a thorough clinical examination and does not involve making a clinical diagnosis resulting in a treatment plan. A screening is intended to identify gross dental or oral lesions, and is conducted by dentists, dental hygienists, and
other appropriate health care workers, in accordance with applicable state law.

The information gathered through a screening survey is at a level consistent with monitoring the national health objectives found in the United States Public Health Service’s *Healthy People* document. Surveys are cross sectional (looking at a population at a point in time), and descriptive (intended for determining estimates of oral health status for a defined population). (Association of State & Territorial Dental Directors, 2012, p. 1)

**Data Analysis**

The preassessment data were retrieved from the Clinic Coordinator Jan Tronzo through personal communication in September 2012. These were used as baseline data. The existing wait times were as listed: ≥ 30 days for dental appointments and ≥ 6 months waiting time for cleanings. A waiting list of 60 patients was entered as baseline data. Further quantification found specifically 20 dental patients were waiting for treatment by the dentist, and 40 patients were waiting for cleanings. The clinic operation schedule was identified as twice weekly 3-hour sessions. Additionally, the average weekly procedures completed for the 3-hour sessions were identified as two to three cleanings and four fillings or extractions.

Postscreening implementation data were analyzed using SPSS software (Version 18). The patient care factors data were classified as ratio, with additional nominal data to compare gender, race, ethnicity, and conditions present. Surrogate patient care variables were measured to show the effect of the screening program. These variables were patient care factors (wait times, number of patients waiting, number of services provided). Related variables identified were age, gender, race/ethnicity, gingival inflammation, and number of teeth present. An independent *t*-test was performed to determine if there were statistical differences in patient wait times and the
number of patients waiting after the screening program as compared to baseline data. For comparison of the additional variables, additional statistical test for the nominal data have been listed as Chi-square, frequency tables, and one-way analysis of variance (ANOVA). Further explained by McDonald, “If variable X is width of the head in millimeters, it's a measurement variable, and you'd analyze it with a $t$-test or a Model I one-way analysis of variance (ANOVA)” (2010, p. 1). The alpha level was set at .05 and the beta level was set at .20; the medium effect size was chosen.

**Hypothesis**

The hypothesis is implementing the screening program will increase effectiveness and efficiency of patient care in the community clinic setting.

**Null Hypothesis**

The null hypothesis is the screening program will not affect the effectiveness or efficiency of patient care for the community clinic setting.

**Summary**

The problem has been identified, and the variables and data have been set. As the research process has shown, this challenge has proven to be substantial. There are many variables in the equation. Yet, the resources have seemed to be dwindling. The data have provided a guided path for resources to be allocated most effectively and efficiently. The purpose of this research has been to enable the Nelson County to operate at full potential. Appendix F has been included to be sent to patients upon final implementation. As Brockelhurst et al. (2012) so aptly described the potential benefits of screening to, “reduce the problem inherent in the current system…where patients with the least need are seen and treated by the most expensive resource, whilst patients with the high levels of need have problems accessing dental services” (p. 240).
The purpose of this research was to measure the effect of implementing a screening process into the community clinic setting. The specific goal was to collect data that would provide, “a model that will ensure a balance between what is efficacious and what will address a community’s priorities and capacity…” (Layde et al., 2012, p. 617). Kettner et al. (2008) described this as the process to “insure there is a good fit of service to need, so that service can be more precisely focused on getting the kind of results intended” (p. 10). This screening was performed to introduce a needed mechanism to triage dental needs for the Nelson County Community Clinic.

Baseline preassessment (pretest) data of patient care factors were retrieved from the Clinic Coordinator Jan Tronzo through personal communication in September 2012. This was further quantified as wait times: ≥ 30 days for dental appointments and ≥6 months (180 days) for cleanings. A waiting list of 60 patients was entered as baseline data. Further quantification found specifically, 20 dental patients on the dental waiting list and 40 patients were waiting on the cleaning list. This baseline pretest data of surrogate patient care variables was compared to posttest data retrieved from the screening research.

Participants

Participants of this research were patients of the Nelson County Community Clinic. This was a nonprobability convenience sample comprised of patients on the waiting list for the clinic and new patients presenting with treatment needs. During the time period of April 5, 2013, to May 8, 2013, a pilot study was done to measure the effect of the screening process on patient care factors for the clinic. Specifically, 30 patients were screened for dental needs with the
ASTDD Screening form. As a result of the screening, the patients were scheduled according to their level of need and the availability of resources for a full examination and subsequent treatment. Only patients who met criteria for treatment at the Nelson County Community Clinic were included in this research. Therefore, only noninsured, working residents of Nelson County aged 19 to 64 existing at 185% below the federal poverty level were included. Pregnant women were excluded from this study. All patients who presented for the screening procedure participated in the research by signing the informed consent document. No patients refused to participate in the research.

The demographic variables captured on the screening form were patient age, gender, race, and ethnicity. Patient oral screening information variables were identified as: number of upper teeth, number of lower teeth, presence of untreated decay, presence of root fragments, and need for periodontal care. More importantly, the presence of suspicious soft tissue lesions and levels of need for treatment urgency were quantified. Results have been shown in Tables 1, 2 and 3.

Table 1.

**ASTDD Screening Form Demographic Data**

<table>
<thead>
<tr>
<th>Age</th>
<th>Mean 43.63</th>
<th>Median 45.5</th>
<th>Mode 53</th>
<th>Range 21-63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>8 Males</td>
<td>22 Females</td>
<td>26.7% Male</td>
<td>73.3% Females</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>25 White</td>
<td>5 Black</td>
<td>83.3% White</td>
<td>16.7% Black</td>
</tr>
</tbody>
</table>

Table 2.

**ASTDD Screening Form Levels of Need**

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>6.7</td>
<td>6.7</td>
<td>6.7</td>
</tr>
<tr>
<td>1</td>
<td>16</td>
<td>53.3</td>
<td>53.3</td>
<td>60.0</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>40.0</td>
<td>40.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.

*Oral Screening Information*

<table>
<thead>
<tr>
<th>Presence of upper denture</th>
<th>No: 29 patients</th>
<th>96.7% No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes: 1 patient</td>
<td></td>
<td>3.3% Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presence of lower denture</th>
<th>No: 29 Patients</th>
<th>96.7% No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes: 1 patient</td>
<td></td>
<td>3.3% Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of natural teeth</th>
<th>Mean: 12.43</th>
<th>Mean: 12.73</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median: 14</td>
<td>Median: 14</td>
<td></td>
</tr>
<tr>
<td>Mode: 14</td>
<td>Mode: 14</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presence of untreated decay</th>
<th>No: 9 patients</th>
<th>30% No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes: 21 patients</td>
<td></td>
<td>70% Yes</td>
</tr>
<tr>
<td>Edentulous: None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presence of root fragments</th>
<th>No: 28 patients</th>
<th>93.3% No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes: 2 patients</td>
<td></td>
<td>6.7% Yes</td>
</tr>
<tr>
<td>Edentulous: None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Need for periodontal care</th>
<th>No: 10 patients</th>
<th>33.3% No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes: 20 patients</td>
<td></td>
<td>66.7% Yes</td>
</tr>
<tr>
<td>Edentulous: None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presence of suspicious soft tissue lesions</th>
<th>No: 29 patients</th>
<th>96.7% No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes: 1 patient</td>
<td></td>
<td>3.3% Yes</td>
</tr>
</tbody>
</table>

*Results*

The research question stated: Does implementing the screening process improve patient care for the community clinic? The hypothesis stated that implementing the screening program
would increase effectiveness and efficiency of patient care in the community clinic setting. The null hypothesis has been stated that the screening program would not affect the effectiveness or efficiency of patient care for the community clinic setting.

**t-Test for Independent Means**

Thirty patients were screened in the community clinic setting. Pretest baseline data of patient wait times and number of patients on the waiting list, and number of services provided were compared to posttest data with **t-Test** for independent means. The null hypothesis was rejected due to significance at the \( p < .05 \) value for testing pre- and postpatient wait times, number of patients on waiting list, and number of services provided.

**Patient Care Factor: Number on Waiting List**

In regard to the patient care factor of number of patients on the waiting list, the decision was to reject the null hypothesis. This was rejected due to evidence that the screening process was effective at the alpha level of .05. The formula was written \( TS=t_{29}=9.278=.000 < .05 \). In fact, the number of patients on the waiting list decreased from 60 to 28 which is a 53% decrease. The list decreased to almost half of the original size. Further quantification found 17 patients waiting on dental treatment and 11 patients waiting on cleanings. These were compared to the pretest data of 20 dental patients waiting on treatment and 40 patients waiting on cleanings. The resulting decrease of the size of the list and the reduction of number in each category stands as valid evidence for the effect on this patient care factor. Stated clearly, in Table 4 **t-Test** output results showed a significant decrease in the number of patients on the waiting list.

**Patient Care Factor: Patient Wait Time**

Data collected in regard to the patient care factor of patient wait time also showed significance at the alpha level of .05. The wait time of 180 days was used due to the pretest
screening practice of scheduling patients for complete examinations at initial visits. When compared to the baseline wait period of 30 to 180 days of average patient wait time to be seen in the clinic, the postdata wait time decreased to an average of 11.40 days. Moreover, the mode of the patient’s wait time during the pilot study was recorded as zero (0 days) or no days of wait time. Therefore, the null hypothesis was rejected for the patient care factor of wait time.

Table 4.

Output of t-Test for independent means
Patient care factors: wait time and number on list

<table>
<thead>
<tr>
<th>Group Statistics</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>number on list</td>
<td>1</td>
<td>30</td>
<td>60.00</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>30</td>
<td>46.23</td>
<td>8.127</td>
</tr>
<tr>
<td>waiting time</td>
<td>1</td>
<td>30</td>
<td>180.00</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>30</td>
<td>12.43</td>
<td>16.927</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>number on list</td>
<td>Equal variances assumed</td>
<td>49.570</td>
<td>.000</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>9.278</td>
<td>29.00</td>
<td>0</td>
</tr>
<tr>
<td>waiting time</td>
<td>Equal variances assumed</td>
<td>175.181</td>
<td>.000</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>54.22</td>
<td>29.00</td>
<td>0</td>
</tr>
</tbody>
</table>

54
Patient Care Factor: Number of Services Performed

In comparing the patient care variable of number of services performed per clinical session. Prior to onset of pilot study, the average number of services performed was stated as seven per clinic. Specifically, there was an average of four dental services and three cleanings per clinic. Posttest data of clinical sessions during and after pilot study revealed an average of 8 to 12 services performed. Further quantification of posttest data revealed an average of five dental patients, with seven full exams and cleanings. The mean of services performed increased almost 50%. The output for this patient care factor has been shown in Table 5.

Table 5
Output of t-Test for independent means
Patient care factor: Services Performed

<table>
<thead>
<tr>
<th>Group Statistics</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>serviced performed per clinic</td>
<td>1.00</td>
<td>5</td>
<td>7.00</td>
<td>.000</td>
</tr>
<tr>
<td>...</td>
<td>2.00</td>
<td>5</td>
<td>10.40</td>
<td>2.191</td>
</tr>
</tbody>
</table>

Independent Samples Test

<table>
<thead>
<tr>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>serviced performed per clinic</td>
<td>Equal variances assumed</td>
</tr>
<tr>
<td>...</td>
<td>Equal variances not assumed</td>
</tr>
</tbody>
</table>
Discussion

The screening research pilot study was conducted from April 5, 2013, to May 8, 2013. Thirty patients of the Nelson County Community Clinic participated in the screening study. Baseline data (pretest) comprised of surrogate patient care variables were compared to posttest data after implementation of the screening program. In comparing the patient care factors of patient wait time, number of patients on waiting list, and services performed the t-test for independent means showed evidence that the screening process was effective at the alpha level of .05. Moreover, the days of waiting were decreased significantly for the urgent needs patients and were almost within the realm of ideal. Ideal wait times identified by ASTDD for Code 2 (urgent care) were quantified as ≤ 7 days, Code 1 (early care) ≤ 21 days, and Code 0 (no obvious problem) ≤60 days (few months). Moreover, the decrease in wait time from 180 days on average to a mean of 15.94 for Code 1 (early care) and a mean of 7.25 for Code 2 (urgent care) was a marked improvement.

Most importantly, because of the screening process, a suspicious lesion (sign of oral cancer) was identified on a patient. This patient was promptly examined by a licensed dentist and referred for a biopsy. One of 30 patients would have not previously merited notation statistically. However, it was noted that the average wait time for initial exam was recorded as 180 days pre-pilot study for screening. The poststudy wait time was reduced to 2 days. This was truly a significant difference that led to a marked earlier detection of the lesion.

Through this research, it should be noted, three surrogate patient care variables were tested for significance at the alpha level of .05. The results have been tabulated and recorded. Significance was noted in the variables. Furthermore, when testing against the ideal waiting time per patient’s identified level of need, the postscreening data were significant. The facts have supported rejection of the null hypothesis. The research hypothesis has been supported. The
screening program did increase effectiveness and efficiency in the community clinic setting.

Support for implementation of the screening program has been shown through the statistical data.
CHAPTER 5
DISCUSSION, CONCLUSIONS, and RECOMMENDATIONS

It has been well established that the uninsured poor populations’ oral health has been affected at disproportionate rates. Oral disease has not discriminated in choosing its victims. However, treatment has remained dependent on insurance or the ability to pay out of pocket at the time services are rendered. Moreover, Broder, Skolnik, and Schlussel (2003) elaborated, “As the vanguard of health care has advanced, the gaps between the haves and the have-nots, have become even more pronounced and disturbing” (p.105). The Institute of Medicine (2011) report stated, “oral health care eludes many vulnerable and underserved individuals—including racial and ethnic minorities, people with special health care needs, older adults, pregnant women, populations of lower socioeconomic status, and rural populations, among others” (p. 1).

The ADHA (2001) cited the lack of sufficient finances as the most prevalent barrier to dental care. The World Health Report of 2003 stated, “traditional treatment of oral disease is extremely costly, the fourth most expensive disease to treat in most industrialized countries… the greatest burden of all diseases is on the disadvantaged and socially marginalized” (Peterson, 2003, p. 9). More importantly, Harrington and Estes (2008) showed “adults are disproportionately represented and constitute the large majority, with those 18 to 44 years old making up roughly 60% of the uninsured” (p. 89).

In fact, “to address the dental care access problem, public and voluntary sector organizations have developed dental clinics to provide services to populations that are unable to purchase private sector care…[referred to as the] ‘safety net’” (Bailit et al., 2005, p. 807). O’Connor (2012) cited these clinics as providing care for almost a fourth of the patients in need. However,
resources have proven to be limited and the need for innovative methods to efficiently care for patients has remained.

The Nelson County Community Clinic showed need for a mechanism to triage patients with dental needs. The priority was enabling resources to be used effectively to meet the dental needs of this population. Furthermore, Brockelhurst, Ashley, Walsh, and Tickle (2012) stressed the potential of screening in solving the problem, which has shown to be “inherent in the current system in the United Kingdom and other similar populations, where patients with the least need are seen and treated by the most expensive resource, whilst patients with the high levels of need have problems accessing dental services” (p. 240).

The sheer number of underserved patients presenting for treatment has produced problems to be solved. “In public health services and health maintenance organizations, such as military health services the demand for health care often exceeds the immediate service rendering capability” (Postma, 2007, p. 1287). In addition, Postma (2007) explained that “long waiting lists may also contribute to deterioration in clinical status before intervention eventually takes place” (p. 1287). Postma (2007) performed a study to examine the effects of a screening tool to predict the presence of periodontal disease and cavities. The results supported screening efforts.

The use of dental hygienist to combat oral disease in the community environment has been established. Screening for oral disease in order to identify needs and direct appropriate resources has been shown to be effective. Thompson and Boyer (2006) cited advantages to visual screenings as, “low cost in terms of equipment, preparation, clean up, and manpower” (p. 8). Thompson and Boyer (2006) stressed, “dental hygienists have a long history of providing oral health screenings in community settings…” (p. 1). The authors cited a 1929 book that stated, “She [dental hygienist] makes thorough and detailed mouth examinations and records the needs
of each individual” Wood and Rowell (as cited in Thompson & Boyer, 2006, p. 2). The use of dental hygienists as effective screeners has been questioned. The opposing argument has been to only use dentists. However, Thompson and Boyer (2006) conducted a study that showed dental hygienist as effective in this role. Moreover, they “demonstrated high specificity, and moderate sensitivity for caries [cavities] identification” (p. 1). Thompson and Boyer explained the importance of a team effort to provide the screenings. The authors further noted that while most hygienists prefer to use the American Dental Association’s Type 4 examination, “using tongue depressor, available illumination [to complete a visual dental hygiene screening]… dentists typically use type 3, a mirror, tactile dental inspection” (Thompson & Boyer, 2006, p. 2). The authors of the study explained that they incorporated training and inter-examiner skills calibration before initiation of screening. The “criteria of measurement…were based on the National Institutes of Health epidemiological protocols…[and] were the standard of validity” (Thompson & Boyer, 2006, p. 3). Two hygienists and one local dentist participated as screeners. The goals were to examine validity of visual screening against the gold standard of the dentist using tactile dental inspection. While the use of dentists with equipment for tactile examination with mirrors and explorers was considered ideal, validity of dental hygienists as screeners was established. The advantages of visual screenings were listed by Thompson and Boyer as, “low cost in terms of equipment, preparation, clean-up, and manpower. This study ascertained that child contact time for one dentist to perform the [tactile] MTDI was more than twice that for one dental hygienist to perform the [visual] VDHS” (2006, p. 8). The results of this study would best be stated as having helped prove the validity of health professionals to provide a team effort toward screening.
Brocklehurst et al. (2012) performed a study to discern the ability of adjunct dental personnel to screen oral disease against the gold standard of dentists. The argument was that if adjuncts could perform screenings, it could lighten the clinical load on dentists, allow more of the urgent needs of the underserved to be treated, and conserve resources. The results indicated that while dentists rated most excellent in rating oral disease, the use of adjuncts was supported through the data. Critics stated that visualizing only the occlusal (chewing) surfaces of the teeth was not sufficient in predicting decay. The authors stressed that it should be noted, “screening is not the same as diagnosis or treatment planning which requires substantial training and the development of clinical reasoning, pursuant to a qualified dentist” (Brockelhurst et al., 2012, p. 244).

Dental screening was further explained as,

The dentist [hygienist] uses a penlight, disposable gloves, disposable mouth mirror, and sterile gauze, to inspect all four quadrants of the patient’s mouth, looking for loose, missing, or broken teeth; fillings; signs of poor oral hygiene; and tooth pain and sensitivity. The dentist [hygienist] also performs an extra-oral exam, looking at the lips, neck, and jaw for any abnormalities. Using this information, the dentist [hygienist] triages the patient, determining the need for urgent or routine followup care…[The patient was given] personalized oral health education and a demonstration of how to care for his or her teeth… Patients are also given toothbrushes, toothpaste, and floss samples to take home. (AHRQ, 2009, p. 1)
The use of screening has been implemented by the Association of State & Territorial Dental Directors. The process was defined to clearly differentiate screening versus complete exam,

Screening is not a thorough clinical examination and does not involve making a clinical diagnosis resulting in a treatment plan. A screening is intended to identify gross dental or oral lesions, and is conducted by dentists, dental hygienists, and other appropriate health care workers, in accordance with applicable state law. The information gathered through a screening survey is at a level consistent with monitoring the national health objectives found in the United States Public Health Service’s *Healthy People* document. Surveys are cross sectional (looking at a population at a point in time), and descriptive intended for determining estimates of oral health status for a defined population. (Association of State & Territorial Dental Directors, 2012, p. 1)

**Conclusions**

Research was conducted during a 6-week pilot study to test the screening process during April 5, 2013, to May 8, 2013, at the Nelson County Community Clinic. The research question was stated: Does implementing the screening process improve patient care for the community clinic? A licensed dental hygienist screened 30 patients and triaged dental needs with the ASTDD Screening Survey. Prior to the pilot study implementation, baseline data of surrogate patient care factors (wait times, number on waiting list and number of services provided) were retrieved. Data retrieved were labeled as posttest and were tested for statistical significance. The research hypothesis was supported. Further stated, implementing the screening program did increase effectiveness and efficiency of patient care in the community clinic setting.
The purpose of this research was to measure the effect of implementing a screening process into the community clinic setting. The specific goal was to collect data that would provide, “a model that will ensure a balance between what is efficacious and what will address a community’s priorities and capacity…” (Layde et al., 2012, p. 617). Kettner et al. (2008) described this as the process to “insure there is a good fit of service to need, so that service can be more precisely focused on getting the kind of results intended” (p. 10).

One of the most pertinent contributions of this research was the data indicating the need for dental resources for the adult working poor population researched. Davis et al. (2010) had echoed this sentiment with their statement regarding attention to dental need be “…not limited to pediatric or geriatric patients because conditions appear among patients across all ages” (p. 520). The lack of pertinent data measurement depicting the level of need for the underserved population has been cited frequently. Kim (2009) explained, “You know, these folks are trying to solve this terrible problem...They don’t measure anything. But they’re on the right side, so that’s okay. I think we’re in a different time” (p. 3). Therefore, the data collection portion of the research could be proven beneficial to the profession and the patients we serve.

Through this research, it was expected that if assessment through the screening process was successful, treatments could be tailored to specific needs and sufficient resources could be allotted as necessary. More specifically, the practical application was that resources were allocated more efficiently in caring for the patients of the Nelson County Clinic. This could create an effective means of providing access to dental care for the working poor population. However, over generalizing the results would be premature. As Guay (2004) warned, “The problem of inadequate access to dental care for some segments of the population is complex and
cannot be solved simply…the ‘one-size fits all’ concept will generate inadequate solutions” (p. 1599).

If proven successful, an effective adult survey system would be gained and could be replicated across the country. The World Oral Health Report (2003) stated, “The major challenges of the future will be to translate knowledge and experiences of disease prevention into action programmes” (Peterson, 2003, p. 16). The purpose of this research was to promote action and to provide a path of access to dental care for the adult working poor population.

Brocklehurst et al. (2012) explained the critics of adjunct dental personnel to screen oral disease against the gold standard of dentists. The fact should be stressed, “screening is not the same as diagnosis or treatment planning which requires substantial training and the development of clinical reasoning, pursuant to a qualified dentist” (Brocklehurst et al., 2012, p. 244). The results of the research were consistent with the literature review results in support of the role of dental hygienists for triaging patient needs through screening. However, it should be stressed that the gold standard remains radiographs and complete examination by a licensed dentist. The ASTDD (2010) manual cautioned, “Before embarking on a screening survey, it is important to understand its limitations. A dental screening is not a thorough clinical examination and does not involve making a clinical diagnosis resulting in a treatment plan” (p. 2). The instrument’s lack of specific numerical scoring of disease levels has been recognized as a limitation. The simplicity of the instrument design and lack of instrumentation have been noted as both a strength and weakness. As previously noted, a full examination by a licensed dentist using an explorer and subsequent radiographs has been acknowledged as the gold standard. However, as described by Brocklehurst et al. (2012), “[Screening is] analytically distinct from an examination, as its purpose is to simply determine the probably presence or absence of disease, not to record or
detail the condition to enable a diagnosis to be formulated, pursuant to the skill of a trained dentist” (p. 240). However, this design minimizes the use of resources such as time, staff, and materials. In addition, Postma (2007) further explained the maximizing of resources toward patient care due to the efficiency of screening.

Demographic variables and oral screening information gave depth to the research project and the data collected. However, the most important portion of this research was the suspicious lesion screening. Early detection of oral cancer has been shown to save lives. In addition, risk factors for dental problems and oral cancer have shown to be high in Nelson County, KY. According to the county health rankings, 30% of the population use tobacco and are obese, and almost 20% of the residents drink alcohol (University of Wisconsin, 2012, p. 1). In addition, Subramanian et al. (2009) listed alcohol and tobacco as risk factors. The research completed by Subramanian et al. (2009) identified diagnostic testing as the gold standard method. However, visual screening was shown to be effective. “The most cost-effective approach, as indicated by the cost per life-year saved, is to establish a screening programme for tobacco and alcohol users aged 35 years and above”(Subramanian et al., 2009). The same authors further indicated that the visual screening could be performed every 3 years, and be conducted by dentists or other health care professionals. In comparing costs through research, the authors found diagnostic screening to cost almost $95,000 US dollars. In contrast, visual screening costs were almost half (Subramanian, 2009). Through the screening research, one patient out of 30 participants was found to have a suspicious lesion. The fact must be stressed that without the screening process, this patient would have waited over 180 days for an oral examination. Moreover, the practical implications of screening for this life-threatening condition have been shown through findings in the literature and were relevant in this research.
Recommendations

The first recommendation for future research would be to increase the sample size for the research. A noted weakness was the small size of the clinic and resulting small sample size. This could affect the ability to generalize the findings. Therefore, the sample size would need to be increased. In addition, the 6-week time frame for the pilot study could have been increased. Pilot studies are “designed on a small scale with the intent to determine if there are any positive results that would justify further study” (Cottrell & McKenzie, 2011, p. 185). Further research would be suggested in multiple community clinic settings on a larger scale.

In addition, we recognize that future research with randomization of the sample of patients over a longer period of time would yield a more valid picture of the screening research. While random sampling methods have been proven to be the most ideal, in this research practicality supported the use of the nonprobability convenience sample. Cottrell and McKenzie (2011) explained the weakness associated with the use of the nonprobability convenience sample. However, they supported the inclusion of such sampling methods. They further cited this method as being used often despite the weaknesses. Strengths of this method included savings in resources of time and money.

The health-belief model could be a future avenue of research. The addition of the optional survey portion of the ASTDD Screening tool could be the basis of a research question to find if the perceived needs of the patients matched the actual screened needs. As Postma (2007) reported, this perceived need survey can be useful as a screening tool. The addition of the qualitative survey would provide depth to the screening process research. Moreover, the specific beliefs and need of the patients would provide relevance toward improving clinical care.
Replication of Davis et al. (2010) research would be an avenue for future research. This researcher trained primary care physicians to screen for dental needs. This would be an area of interest for interdisciplinary training and holistic care for the patient. Education of clinicians could be combined with the screening process. This would prove beneficial for the patients, provide data collection on a large scale, and give insight to the physicians on the connection of oral health to systemic health.

This research only reported on one facet of the screening process. Patient care factors showed significance, but these numbers only showed half of the picture. Surveys of the patients, clinical staff, and personnel of the Nelson County Community Clinic could be researched. In addition, quality indicators should be introduced to assure that higher volume of patients served does not equate to decrease in quality of services provided. Significant results for this pilot study screening process research do not automatically transfer to generalized or practical use in replication. These results were promising but were preliminary. This research was not designed or intended to be replicated but to be built upon and expanded through future endeavors. It is hoped that this research will introduce the potential of the screening process for the adult working poor population and improve patient care for the safety net clinics that serve them.
REFERENCES


Muirhead, V., Quinonez, C., Figueiredo, R., & Locker, D. (2009). Oral health disparities and


APPENDICES
APPENDIX A
PERMISSION FORM FOR CLINIC

Nelson County Community Clinic
300 West John Fitch Avenue, Suite 200
Bardstown, Kentucky 40004
Phone: 502-349-5990 Fax: 502-349-5993
ncccc@bardstown.com

11-5-2012

To Whom It May Concern,

On behalf of the board of Directors and patients of the Nelson County Community Clinic, we are delighted to have Babbette Southard volunteer to conduct dental patient screenings. Ms. Southard will be working at the clinic with oversight by our dental director, Steve Auslander, DMD.

Sincerely,

Jan Tronzo, R.N., B.S.N.
Executive Director

Board of Directors:

Officers:
Dean Watts, Chairman
Nelson County Judge Executive
Larry Hicks, Vice-Chairman
President & CEO, Salt River Electric
Jill Clark, R.N.
Secretary
Trudy Sutherland
Treasurer
Jan Tronzo, R.N., B.S.N.
Executive Director
Mark Abramovich, M.D.
Medical Director
Steve Auslander, D.M.D.
Dental Director
Cari Divers, R.Ph.
Pharmacy Director

Members:
Karen Gabbert, R.N., B.S.N.
Retired Nurse Educator
Bobbi Harned, R.N., B.S.N.
Director Cancer Center
Flaget Memorial Hospital
Karl Lusk, B.S., M.A.T.
Chaplain
Flaget Memorial Hospital
Andrew Meredith
Financial Counselor
Tammi Moore, R.N.
Clinical Director
Nelson County Health Department
Bill Osbourne
Retired Communicare
Sharon Reed
Medical Receptionist
Linda Sims, R.N., M.S.N.
District Director
Lincoln Trail Health Dept.
Dorothy White, Director
Nelson County Chamber of Commerce
APPENDIX B
INFORMED CONSENT

Title of Project: Screening the Safety Net

Principal Investigator: Babette Southard CDA, BSDH
Nelson County Community Clinic
300 West John Fitch Avenue, Suite 200
Bardstown, KY 40004
(502) 827-3108
Zbils32@goldmail.etsu.edu

This Informed Consent will explain about being a participant in a research study. It is important that you read this material carefully and then decide if you wish to be a volunteer.

1. Purpose of the Study: The purpose of this research has been stated to measure the effect of placing an oral health screening process for the Nelson County Dental Clinic.

2. Procedures to be followed: You will be asked to allow a brief visual exam of your mouth by a licensed dental hygienist to rate your oral health condition. The process is to look inside the mouth to be able to screen for oral health needs.

3. Alternatives: The alternative procedures/treatments available to you if you elect not to participate in this study are: to continue to remain with current system of remaining on the waiting list until scheduled appointment can be attained.

4. Duration/Time: This screening process will take approximately 5 to 10 minutes.

5. Statement of Confidentiality: Every attempt will be made to see that your study results are kept confidential. Your participation in this research is confidential. The information attained will only be used for scheduling purposes and for measuring the effect of the screening program. The data will be stored and secured in a locked/password protected file which will be kept with researcher for at least 5 years after the end of this research. All information will be coded by generic number and held confidential. The results of this study may be published and/or presented at meetings without naming you as a subject. Your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, only ETSU IRB and personnel particular to this research have access to the study records. Your records will be kept...

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completely confidential according to current legal requirements. They will not be revealed unless required by law, or as noted above.

6. **Right to Ask Questions:** Please contact Babette Southard CDA, BSDH at (502) 827-3108 with questions or concerns about this study. If you have any questions, problems or research-related medical problems at any time, you may call researcher at (502) 827-3108. You may call the Chairman of the Institutional Review Board at 423/439-6054 for any questions you may have about your rights as a research subject. If you have any questions or concerns about the research and want to talk to someone independent of the research team or you can’t reach the study staff, you may call an IRB Coordinator at 423/439-6055 or 423/439/6002.

7. **Foreseeable Risks:** The screening process will involve the use of only a dental mouth mirror and gauze. No treatment will occur. Therefore, no foreseeable risks or discomfort exist.

8. **Costs:** There is no cost for participating in this research.

9. **Benefits:** The benefit intended for this research is to enhance service to the patients of the Nelson County Community Clinic in an effort to make the clinical scheduling more efficient and effective.

10. **Voluntary Participation:** Your decision to be in this research is voluntary. You can stop at any time. You do not have to answer any questions you do not want to answer. You have the right to refuse to participate in the screenings without any penalty. If you quit or refuse to participate, the benefits or treatment to which you are otherwise entitled will not be affected.

11. **Authorization To Use and Disclose Protected Health Information for Research Purposes:**

The privacy law, Health Insurance Portability & Accountability Act (HIPAA), protects my individually identifiable health information (protected health information). The privacy law requires me to sign an authorization (or agreement) in order for researchers to be able to use or disclose my protected health information for research purposes in the study entitled: Screening the Safety Net.

I authorize Babette Southard CDA, BSDH and his/her research staff to use and disclose my protected health information for the purposes described below. I also permit my doctors and other health care providers to disclose my protected health information for the purposes described below.

**My protected health information that may be used and disclosed includes:**

- Demographic information, screening form, and coded chart number.

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The Investigator, Babette Southard CDA, BSDH may use and share my health information with:

- The East Tennessee State University Human Research Protections Program (HRPP) Institutional Review Board Administration when the researcher or the research site is undergoing Quality Improvement Program (QIP) auditing.
- The James H. Quillen Veterans Affairs Medical Center Office of Research & Development when the researcher or the research site is undergoing Quality Improvement Program (QIP) auditing.
- Government representatives, when required by law
- Nelson County Community Clinic

Once my health information has been disclosed to anyone outside of this study, the information may no longer be protected under this authorization. The investigator, Babette Southard CDA, BSDH and Nelson County Community Clinic agree to protect my health information by using and disclosing it only as permitted by me in this Authorization and as directed by state and federal law.

I do not have to sign this Authorization. If I decide not to sign the Authorization:

- It will not affect my treatment, payment or enrollment in any health plans nor affect my eligibility for benefits.
- I cannot be allowed to participate in this research study.

After signing the Authorization, I can change my mind and:

- Not let the researcher disclose or use my protected health information (revoke the Authorization).
- If I revoke the Authorization, I will send a written letter to: Babette Southard CDA, BSDH to inform him/her of my decision.
- If I revoke this Authorization, researchers may only use and disclose the protected health information already collected for this research study.
- If I revoke this Authorization my protected health information may still be used and disclosed should I have an adverse event (a bad effect, or experience something unanticipated).
- If I change my mind and withdraw the authorization, I may not be allowed to continue to participate in the study.

This Authorization does not have an expiration date.

If I have not already received a copy of the Privacy Notice, I may request one by contacting the Privacy Officer. If I have any questions or concerns about my privacy rights, I should contact the East Tennessee State University, James H. Quillen College of Medicine Privacy Officer, Paula Wright, at 423/433-6074

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I am the subject or am authorized to act on behalf of the subject. I have read this information, and I will receive a copy of this form after it is signed.

By signing below, you confirm that you have read or had this document read to you. You will be given a signed copy of this informed consent document. You have been given the chance to ask questions and to discuss your participation with the investigator. You freely and voluntarily choose to be in this research project.

In addition, by signing below, you are authorizing the use and disclosure of your protected health information for research purposes as described above.

You must be 18 years of age or older to consent to take part in this research study. If you agree to take part in this research study and the information outlined above, please sign your name and indicate the date below.

SIGNATURE OF PARTICIPANT

DATE

PRINTED NAME OF PARTICIPANT

DATE

SIGNATURE OF INVESTIGATOR

DATE

Final Version 2/22/13

DOCUMENT VERSION EXPIRES

APR 04 2014

ETSU/VA IRB

APPROVED

By the ETSU/VA IRB

APR 05 2013

Chair/IRB Coordinator
### APPENDIX C

**ASTDD SCREENING SURVEY**

#### Site Information

<table>
<thead>
<tr>
<th>Site ID Code</th>
<th>Screen Date</th>
<th>Screener ID Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
<td>00/00/00</td>
<td>00</td>
</tr>
</tbody>
</table>

#### Demographic Information

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Race/Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Oral Screening Information

- Do you have a removable upper denture?
  - If Yes: Do you usually wear your upper denture when you eat?
    - 0 = No
    - 1 = Yes

- Do you have a removable lower denture?
  - If Yes: Do you usually wear your lower denture when you eat?
    - 0 = No
    - 1 = Yes

Ask participant to remove dentures and remove excess oral debris if necessary.

<table>
<thead>
<tr>
<th># of Upper Natural Teeth</th>
<th># of Lower Natural Teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>

#### Oral Conditions

- Untreated Decay
  - 0 = No
  - 1 = Yes
  - 9 = Edentulous

- Need for Periodontal Care
  - 0 = No
  - 1 = Yes
  - 9 = Edentulous

- Treatment Urgency
  - 0 = No obvious problem – next scheduled visit
  - 1 = Early care – within next several weeks
  - 2 = Urgent care – within next week – pain or infection

### Comments:

**NOTE:** If you are collecting information on age, gender and race using a questionnaire, you can delete those fields from this form.
APPENDIX D

IRB APPROVAL LETTER

East Tennessee State University
Office for the Protection of Human Research Subjects • Box 70565 • Johnson City, Tennessee 37614-1707
Phone: (423) 439-6053 Fax: (423) 439-6060

IRB APPROVAL – Initial Expedited Review

April 5, 2013
Babette Southard

Re: Screening the Safety Net
IRB#: 0213.27s
ORSPA #: 

The following items were reviewed and approved by an expedited process:
• xform New Protocol Submission; Informed Consent Document (ver 2/22/13); Cover Letter to Patients; Data Collection Screening Form; CV

On April 5, 2013, a final approval was granted for a period not to exceed 12 months and will expire on April 4, 2014. The expedited approval of the study will be reported to the convened board on the next agenda.

The following enclosed stamped, approved Informed Consent Documents have been stamped with the approval and expiration date and these documents must be copied and provided to each participant prior to participant enrollment:
• ICD version 2/22/2013 stamped 4/5/2013

Federal regulations require that the original copy of the participant’s consent be maintained in the principal investigator’s files and that a copy is given to the subject at the time of consent.

Projects involving Mountain States Health Alliance must also be approved by MSHA following IRB approval prior to initiating the study.

Unanticipated Problems Involving Risks to Subjects or Others must be reported to the IRB (and VA R&D if applicable) within 10 working days.

Proposed changes in approved research cannot be initiated without IRB review and approval. The only exception to this rule is that a change can be made prior to IRB approval when necessary to eliminate apparent immediate hazards to the research subjects [21 CFR 56.108 (a)(4)]. In such a case, the IRB must be promptly informed of the change following its implementation (within 10
working days) on Form 109 (www.etsu.edu/irb). The IRB will review the change to determine that it is consistent with ensuring the subject’s continued welfare.

Sincerely,
George Youngberg, M.D., Chair
ETSU/VA Medical IRB
Dear patients,

In an effort to enhance our service to our patients, we are testing a screening process for our dental clinic. A pilot study has been scheduled at the Nelson County Community Clinic for a six week time frame beginning on April 8, 2013. The purpose of this study has been stated to measure the effect of placing an oral health screening process at the Nelson County Dental Clinic.

The process involves a brief visual examination in order to check for the presence of decay or oral disease. This will enable us to attempt to identify ways to make the clinic scheduling efficient. You will be asked to allow a brief visual exam of your mouth by a licensed dental hygienist to rate your oral health condition.

It should be noted, that this is only a brief visual examination, and will not involve any treatment at that time. The process only takes 5 to 10 minutes. Only patients of the Nelson County Community Clinic are eligible for this study.

This is a voluntary screening. You may decline and still receive treatment without penalty.

Please contact Babette Southard CDA, BSDH at (502) 827-3108 with questions or concerns about this study.

Sincerely,

Babette Southard CDA, BSDH
Nelson County Community Clinic
Dear patient,

We have received your application to become a patient of our clinic. We look forward to serving your dental needs. In an effort to enhance our service to our patients, we have implemented a screening process for our dental clinic.

The process involves a brief visual examination in order to check for the presence of decay or oral disease. You will be asked to allow a brief visual exam of your mouth by a licensed dental hygienist to rate your oral health condition. This will allow for more efficient scheduling for dental treatment.

It should be noted, that this is only a brief visual examination, and will not involve any treatment at that time. The process only takes 5 to 10 minutes. Only patients of the Nelson County Community Clinic are eligible. Please call our office for times available and to schedule your dental screening.

Please feel free to call our office with any questions or concerns.

Sincerely,

Babette Southard CDA, BSDH
Nelson County Community Clinic
VITA

BABETTE L. SOUTHARD RDH, BS, MSAH

Personal Data: Date of Birth: February 23, 1966

Place of Birth: Mobile, Alabama

Marital Status: Married

Education: Public Schools, Crestview, Florida

A.S. Dental Hygiene, Greenville Technical College, Greenville South Carolina

B.S. Dental Hygiene, East Tennessee State University, Johnson City, Tennessee 2008

M.S. Allied Health
East Tennessee State University
Johnson City, Tennessee 2013

Professional Experience: Dental Hygienist, Dr. Elizabeth Jones, Greenville, South Carolina, 1991-2003

Clinical Instructor, Greenville Technical College, Greenville, South Carolina, 1992-1997

Dental Hygiene/Dental Assisting Instructor, Elizabethtown Community and Technical College
Elizabethtown, Kentucky, 2004-Present

Dental Hygienist, Bardstown Family Dentistry
Bardstown, Kentucky, 2004-Present

Honors and Awards: Faculty Award, Greenville Technical College

Sigma Phi Alpha, Greenville Technical College

Sigma Alpha Lambda, East Tennessee State University

Graduate School Thesis Scholarship Spring 2013, East Tennessee State University
Golden Key International Honor Society, East Tennessee State University

Association of Interprofessional Healthcare Students (AIHS), East Tennessee State University

Licensure Credentials:

State of South Carolina Dental Hygiene License #2014

State of Kentucky Dental Hygiene License #3365

State of Tennessee Dental Hygiene License #7311