Dental hygienists' beliefs, norms, attitudes, and intentions toward treating HIV/AIDS patients

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Dental Hygienists' Beliefs, Norms, Attitudes, and Intentions
toward Treating HIV/AIDS Patients

by

Barbara Clark-Alexander

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy
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Keywords: human immunodeficiency virus, acquired immune deficiency syndrome,
dental hygiene, willingness to treat,, theory of reasoned action

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Dedication

To the patients with HIV/AIDS who have been marginalized,

and to the dental professionals who have been willing to treat them.
Acknowledgements

It was an honor to work with a brilliant, dedicated and energetic faculty who served on my doctoral and dissertation committees: Robert J. McDermott, Ph.D., my major professor, I appreciate your patience, kindness, direction and wisdom, and thank you for guiding me through this incredible journey that we began so many years ago. Jay Wolfson, Dr.P.H., thank you for your continued diligence in keeping me on the path, Karen (Kay) Perrin, Ph.D., Philip Marty, Ph.D., and Michael Knox, Ph.D., thank you for your guidance and encouragement during the many years that it has taken to develop and complete this research project. I wish to thank Peter Levin, Sc.D., and Jay Wolfson, Ph.D., for launching me into public health with vigor and enthusiasm, and for encouraging me to enroll in this program.

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Dental Hygienists’ Beliefs, Norms, Attitudes, and Intentions Toward Treating HIV/AIDS Patients

Barbara Clark-Alexander

ABSTRACT

There is a great demand and need for oral health care during the course of HIV disease (HIV Costs and Services Utilization Study; Marcus et. al., 2005). HIV+ patients identified three key barriers to obtaining oral health treatment: 1) beliefs and attitudes of dental health care providers (DHCPs) may have lead to their unwillingness to treat HIV/AIDS patients; 2) the existence of racial and ethnic disparities in health care in the United States, and 3) how DHCPs perceive their risk of contracting HIV. The fear and stigma associated with treating patients with HIV further compromises their access to care and their health status. Oral health conditions associated with HIV disease are frequently more severe than those of the general population, making access to both dental and medical care imperative. Plus, Florida has some of the highest numbers of HIV/AIDS patients in the nation.

This study was descriptive, cross-sectional and used quantitative methods to explore the dental hygienists’ behavioral and normative beliefs, attitudes, and intentions toward treating patients with HIV/AIDS. A three-phase pilot study was conducted to assess the validity and reliability of the survey instrument. An email delivery method was used to implement the survey, and a 22% response rate was achieved (n=219). The
majority of respondents were female (96%), white (89%), married (77%), currently working (86%), and had treated HIV/AIDS patients in private practice (80%). Bivariate analysis showed that dental hygienists’ intentions toward treating HIV/AIDS patients were significantly associated with five independent variables, and binary logistic regression confirmed the significance of two of these associations. Overall, study participants indicated that they were willing to, and had positive attitudes toward, clinically treating HIV/AIDS patients; they were confident in their ability to treat them, and their normative beliefs did not hinder their intention to do so, and they did not worry about acquiring HIV in the workplace.

Three recommendations were made: increase access to oral health care for HIV/AIDS patients within community settings by removing barriers to care, incorporate cultural/sensitivity training in all dental/dental hygiene school curriculums, and mandate Florida HIV/AIDS continuing education requirements every biennium for dentists and dental hygienists.
Chapter One

Introduction

Consumer’s perceived unmet need for any health care service is a useful index of both potential demand and actual medical need. Historically, actual demand alone has served as the principal measure of “need” in community health model assessments. This historic perspective notwithstanding, the combination of clinically assessed need (independent of demand) and consumer perception of unmet need may get far closer to an objective basis for determining both the health status of communities and the need for health care professionals and services to care for particular populations more adequately. In the instance of high-risk populations, perceptions of unmet need can be especially valuable in helping to assess both health status and how and where to deploy health care resources.

In the case of oral health, surprisingly little has been done in the external assessment (utilization) or internal assessment (perceived need) of relevant services. There has been a relative dearth of attention paid by health care planners and policy makers to dental health issues, despite the important relationships established among oral health, nutrition and general health.

The perceived unmet need for oral health care is a useful measure of potential demand, because it represents whether people feel their “wants” for dental services are
being fulfilled. In the HIV Costs and Services Utilization Study (HCSUS) of unmet need for oral health treatment in a nationally representative sample of HIV+ patients, an estimated 40% or 88,000 medical patients reported unmet need for oral health care during at least one of three interviews of the (Marcus, Maida, Coulter, Freed, Der-Martirosian, Liu, Freed, Guzman-Becerra, & Andersen, 2005). The perceived unmet need for oral health care in this population is considerably higher than in the general U.S. population (11%; Positive Outcomes, Inc., 2006). There is a great demand and need for oral health care during the course of HIV disease, as it has been shown that physicians are not proficient in diagnosing changes in the oral cavity (Glick & Burris, 1997; Paauw, Wenrich, Curtis, Carline & Ramsey, 1995). Other health care providers, social and support networks rely on dental health care workers to provide services within their area of expertise (Glick, 1996).

Oral health conditions associated with HIV disease are frequently more severe than those of the general population, making access to both dental and medical care imperative. A previous cross-sectional HCSUS study estimated that 33,000 people had unmet dental needs, and unmet dental needs were twice as prevalent as unmet medical needs (Heslin, Cunningham, Marcus, Coulter, Freed, Der-Martirosian, Bozzette, Shapiro, Morton, & Andersen, 2001). The dramatic increase in unmet need for dental services during those four years, speaks to the growing problem of lack of access to dental care for persons with HIV/AIDS.

The significance of these studies (Marcus, et al, 2005; Heslin, et al, 2001) is evident when one considers the scarcity of dental health care professionals that have been willing to treat persons with HIV/AIDS over the last 25 years (Sadowsky & Kunzel,
1994). In fact, the dental profession, particularly in the United States, has been unwilling to give clear and unmistakable answers to individual dentists’ questions about the care of HIV+ patients (Glick & Burris, 1997). Whereas the medical needs of patients with HIV/AIDS are important, unmet dental needs also may negatively influence their health ((NIH/NIDCR, 2000; Zabos et al, 2002).

Statement of the Problem

In the past half-century, we have come to recognize that the mouth is a mirror of the body, it is a sentinel of disease, and it is critical to overall health and well-being. The challenge facing us today—to help all Americans achieve oral health—demands the best efforts of public and private agencies as well as individuals. We must build public-private partnerships to provide opportunities for individuals, communities, and health professionals to work together to maintain and improve the nation's oral health. We also must build an effective health infrastructure that meets the oral health needs of all Americans and integrates oral health effectively into overall health. We must work to change perceptions about oral health among the general public, among policymakers, and among health providers. We must remove the barriers between people and oral health services (NIH/NIDCR/U.S. Surgeon General 3.David Satcher, May 25, 2000, p.1).

The first key barrier has been dental health care providers (DHCPs) whose attitudes may lead to their being unwilling to treat patients with HIV/AIDS. Consequently, persons with HIV/AIDS have presented the dental profession with a
number of ethical challenges (Doyal, 1997). The life-threatening consequences of HIV/AIDS, its infectious nature and the social stigma associated with the disease have led to a range of ethical dilemmas for dental health practitioners including whether or not to treat HIV-infected patients. Despite their training and education, many health care professionals are likely to share some of the same attitudes toward AIDS and HIV+ patients as the lay community (Dow & Knox, 1988).

The Institute of Medicine (IOM) report, *Access to Health Care in America* (1993), noted findings from the Robert Wood Johnson Foundation AIDS Health Services Program and Evaluation Study. The comment repeated in each of the 15 communities studied was that only a handful of private physicians were seeing the majority of persons with HIV disease, and that access to dental care for persons with HIV infection was similarly constrained. Access to dental care is essential for all persons, particularly for ones with complex medical conditions (Glick & Burris, 1997). Therefore, dentists have a moral and professional obligation to provide care to all persons within the dentist’s realm of expertise. However, throughout the HIV/AIDS epidemic, DHCPs have demonstrated an unwillingness to treat HIV-infected patients (Gerbert, Badner & Maguire, 1988; Sadowsky & Kunzel, 1994; Doyal, 1997; McCarthy, Koval & McDonald, 1999).

The issue of access to health care is not new, and this snapshot of more than a decade ago has not changed. A synopsis of a situation in New Orleans, Louisiana was described in the CDC HIV/STD/TB Prevention News Update (Pope, 2004) adapted from an article in the New Orleans *Times-Picayune* from March 17 of the same year. The article stated the concern that individual metropolitan areas would have in making decisions about how they used their HIV/AIDS funds since federal Ryan White funding
had declined in New Orleans by more than $4 million during the last fiscal year. New Orleans was one of 40 U.S. cities that received less money that year. Even prior to Hurricane Katrina disaster of 2005, the cuts meant closure of the local hospital dental clinic that served more than 700 regional HIV patients. The city clinic and Louisiana State University’s dental school clinic were alternatives for receiving care, but long waiting lists existed.

The Ryan White CARE Act provides care and support to those with no or limited insurance, and is the payor of last resort for persons infected with HIV (The Kaiser Family Foundation, 2004). Many Ryan White CARE Act programs that pay for the unmet health needs of persons living with HIV disease have sustained federal funding reductions or have been level-funded for up to five years. Level funding translates into trying to provide the services to even more clients with the same amount of money that was awarded five years ago. The current crisis of federal and state funding of HIV/AIDS dental services, in selected Florida counties must be addressed. In 2004, the West Central Florida Ryan White CARE Council, a regional planning and governing group overseeing funding and provision of services for persons with HIV/AIDS, had only four contracted dentists in eight counties to provide oral health services. When federal funding was reduced, dental funds were re-appropriated throughout service categories that reduced funds for dental services (CARE Council budgetary handout, 2004, August 26). The bottom line translated into less access to dental care. The picture has not changed, and two years later, four dentists continue to serve these eight counties. Additionally, an ad hoc dental advisory committee has been established to review new issues of access to dental care services.
A second issue is the existence of racial and ethnic disparities in health care in the United States as documented in the Institute of Medicine report, *Unequal Treatment* (2002). A conclusion of this report was that provider bias and stereotypical beliefs may play a role in clinical decision-making, with respect to dental care, as members of minority groups are disproportionately affected by both occurrence of the disease and the access issues cited above.

“Those who suffer the worst oral health include poor Americans. . . Members of racial and ethnic groups also experience a disproportionate level of oral health problems. And people with disabilities and complex health conditions are at greater risk for oral diseases that, in turn further complicate their health” (NIH/NIDCR/U.S. Surgeon General David Satcher, May 25, 2000, p.2).

Oral health providers can help in early diagnosis of HIV/AIDS, which can first show up as oral fungal, bacterial or viral infections and lesions (American Public Health Association, 2004).

Regular dental exams by a dentist for people with HIV are important because people with compromised immune systems will generally have the first symptoms show up in their mouth (Heslin et al, 2001; The Henry J. Kaiser Family Foundation, 2001).
Oral health problems associated with HIV are often more complicated and difficult to treat than those problems in the general population, and require the attention of both medical and dental personnel (Heslin et al, 2001).

The third issue pertains to how DHCPs perceive their risk of contracting HIV. Some staff members will experience anxiety and uncertainty when treating HIV-infected people, due in part to stigmatizing beliefs and prejudices (Dow & Knox, 1988). The fear and stigma associated with treating patients with HIV further compromises their access to care, and thus, their health status. “More than two decades into the worst healthcare crisis the world has ever known, ….. stigma still challenges efforts to prevent, to treat and, ultimately, to cure HIV/AIDS. Fortunately, stigma is something we have the ability to prevent, control and eradicate” (Graham, 2005, Kaiser Family Foundation News Release, p.1). Moreover, HIV has come to be viewed as a chronic disease, rather than a terminal disease (Scandlyn, 2000). In 1989, the head of the National Cancer Institute, Samuel Broder, announced at the international AIDS meeting in Montreal, Quebec, that AIDS was a chronic illness, and that the treatment should follow the cancer model. This public statement shifted the social definition of AIDS from an acute to a chronic illness, a shift that came with economic and cultural repercussions for the treatment and understanding of AIDS (Scandlyn, 2000).

Whereas the number of HIV-infected persons continues to increase in Florida and in the southern U. S. in general, the need grows for providing dental services to patients with faltering immune systems. As of June 30, 2005, Florida ranked third in the nation in the total number of AIDS cases among adults and adolescents, and second for the number of HIV cases among adults and adolescents nationally (Florida Department of Health,
September, 2005). Because Florida is highly impacted by HIV/AIDS, a logical question would seem to be “why do persons with HIV/AIDS in Florida have difficulty obtaining dental treatment?”

**Purpose of the Study**

This study will examine the attitudes of currently licensed dental hygienists in Florida with respect to providing treatment to HIV-positive persons. Intentions to treat HIV-positive patients will be explored, as intention is an indicator of probable behavior. Dental health care professionals’ awareness of access to dental care by HIV/AIDS patients has been an ongoing issue. Better data of this type may improve understanding of, and may increase access to, oral health care for the HIV-positive population.

**Assumptions for the Study**

This study contains the following assumptions:

- Instruments chosen to measure attitudes, behavioral and normative beliefs, intention to treat, and behaviors are appropriate;
- Instruments to measure attitudes, behavioral and normative beliefs, intention to treat, and behaviors will validly assess the constructs;
- Persons to whom the surveys are addressed are the individuals who fill them out;
- Respondents to the survey instruments complete them honestly, and to the best of their ability.
Delimitations of the Study

Delimitations are within the researcher’s control. For example, only dental hygienists with active licenses in Florida who are members of the Florida Dental Hygienists’ Association will be included in the study. Participation in the study is voluntary. The study is also delimited to the specific universe of questions and items contained in the survey instrument to measure paradigms, values and behaviors.

Limitations of the Study

Limitations are not under the researcher’s control. This study has several limitations. First, the data used are cross-sectional, and therefore, may not be transferable to other settings and times. Second, study findings may be tempered by the validity of the self-reported measures. Although the assessment survey was designed to enhance validity, the actual validity of the responses is unknown, particularly when questions pertain to sensitive issues such as treating patients with HIV and AIDS in dental practice. Social desirability response bias occurs when a subject reports in a socially desirable manner, rather than reporting the information truthfully (McDermott & Sarvela, 1999). The third issue is generalizability of the study. Persons surveyed may not be representative of all dental hygienists in Florida, and furthermore, dental hygienists in Florida may not be representative of dental hygienists nationally or internationally. Dental hygienists in Florida who are members of professional dental associations may differ from dental hygienists who are not members of these organizations. Moreover, persons who answer surveys, may be different from persons who choose not to answer them. The final issue is one of the practice status of dental hygienists in Florida. By law,
dental hygienists are ruled by the Florida Board of Dentistry, and do not have a regulatory board of their own. This limits their ability to choose to treat patients independently of the dentist.

Definitions of Terms

Acute Illness: characterized by sudden onset, obvious signs and symptoms, with some limitation of normal functioning; treatment is supportive or curative, duration consists of days or weeks and follows a predictable course (Scandlyn, 2000).

AIDS: Acquired Immune Deficiency Syndrome. Most scientists think that HIV causes AIDS by directly inducing the death of CD4+ T cells or interfering with their normal function, and by triggering other events that weaken a person's immune function. People with AIDS often suffer infections of the lungs, intestinal tract, brain, eyes and other organs, as well as debilitating weight loss, diarrhea, neurologic conditions and cancers such as Kaposi's sarcoma and certain types of lymphomas (National Institutes of Health, U.S. Department of Health & Human Services, National Institute of Allergy and Infectious Diseases, 2001).

American Dental Hygienists’ Association (ADHA): the largest national organization representing the professional interests of the more than 120,000 dental hygienists in the United States of America.

Attitude: the tendency to react positively or negatively to a person, object or situation; as a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object (Fishbein, & Ajzen, 1975).
Barriers: component of the Health Belief Model (HBM); an individual’s perceived barriers to successfully performing a health behavior.

Behavioral Intention: perceived likelihood of performing the behavior.

Benefits: component of the Health Belief Model (HBM); an individual’s perceived benefits of successfully performing a health behavior.

Chronic Illness: may arise from an acute episode that does not resolve itself. Course of illness is uncertain and unlimited in time, mostly characterized by periods of acute crisis and remission; treatment is directed at relieving symptoms and slowing degeneration, not effecting cure (Scandlyn, 2000).

Culture: an integrated pattern of human behavior including thought, communication, ways of interacting, roles and relationships, and expected behavior, beliefs, values, practices, and customs (Denboba, Bragdon, Epstein, Garthright, & Goldman, 1998).

Cultural Competence: an individual’s and program’s ability to honor and respect those beliefs, interpersonal styles, attitudes, and behaviors both of families who are clients and the multicultural staff providing services (Denboba, et al, 1998).

Cultural Diversity: differences that people present and the knowledge about such differences (Denboba, et al, 1998).

Dental Health Care Providers (DHCPs): all paid and unpaid personnel in the dental health-care setting who may be occupationally exposed to infectious materials. Besides those persons working in direct patient care, other persons not directly involved in patient care such as administrative, clerical, housekeeping, maintenance or volunteer personnel may also be potentially exposed to infectious
agents that may include body substances, contaminated supplies, equipment, environmental surfaces, water or air.

Dental Hygiene: the rendering of educational, preventive, and therapeutic dental services pursuant to Florida Statutes 466.023 and 466.024, and any related extra-oral procedure required in the performance of such services.

Dental Hygienist: a licensed dental professional who works under the direct or indirect supervision of a licensed dentist to examine and clean the teeth and oral structures, and teach preventive oral health to patients; preventive oral health professionals, licensed in dental hygiene, who provide educational, clinical and therapeutic services that support total health through the promotion of optimal oral health.

Dentist: a person who is skilled in and licensed to practice the prevention, diagnosis, and treatment of diseases, injuries, and malformations of the teeth, jaws, and mouth.

Dentistry: the healing art which is concerned with the examination, diagnosis, treatment planning, and care of conditions within the human oral cavity and its adjacent tissues and structures. It includes the performance or attempted performance of any dental operation, or oral or oral-maxillofacial surgery and any procedures adjunct thereto, including physical evaluation directly related to such operation or surgery pursuant to hospital rules and regulations. It also includes dental service of any kind gratuitously or for any remuneration paid, or to be paid, directly or indirectly, to any person or agency.

Direct Access: dental hygienist can initiate treatment based on their own evaluation of the patient’s needs and without the specific authorization of a dentist, treat the
patient without the presence of a dentist, and can maintain a provider-patient relationship (American Dental Hygienists’ Association, 2007).


Duty: an action which others must perform in order to satisfy individual claims.

Effect Size: the degree to which the null hypothesis is false (the size of the effect of an independent variable on the dependent variable; Munro, 2005).

Florida Dental Association (FDA): a professional organization representing dentists licensed in the state of Florida.

Florida Dental Hygienists Association (FDHA): a branch of the American Dental Hygienists Association that advocates for dental hygienists practicing dental hygiene in Florida.

Health Disparity: an inequality or gap that exists between two or more groups. Health disparities are believed to be the result of the complex interaction of personal, societal, and environmental factors; the diminished health status of population subgroups defined by demographic factors such as age and socioeconomic status (SES), geography, disability status, and behavioral lifestyles (National Institutes of Health, U.S. Department of Health & Human Services, National Institute of Dental and Craniofacial Research, 2002).

HIV: Human Immunodeficiency Virus. HIV belongs to a subgroup of retroviruses known as lentiviruses, or "slow" viruses. The course of infection with these viruses is characterized by a long interval between initial infection and the onset
of serious symptoms. HIV disease is characterized by a gradual deterioration of immune function where crucial immune cells called CD4+ T cells are disabled and killed during the typical course of infection. These cells, sometimes called "T-helper cells," play a central role in the immune response, signaling other cells in the immune system to perform their special functions. During HIV infection, the number of these cells in a person's blood progressively declines. When a person's CD4+ T cell count falls below 200/mm3, he or she becomes particularly vulnerable to the opportunistic infections and cancers that typify AIDS, the end stage of HIV (National Institutes of Health, U.S. Department of Health & Human Services, National Institute of Allergy and Infectious Diseases, 2004).

Hypothesis: a prediction about the nature of the relationship between two or more variables (Mark, 1996).

Intention: a person’s purpose, goal, aim or objective.

Internet access: Using a computer to access the World Wide Web via a search engine.

Kurtosis: a measure of whether the curve is normal, flat, or peaked.

Market Justice: individuals are responsible for their own health. Personal responsibility is the basis for distributing burdens and benefits, and people are responsible for their own actions. Few expectations exist that society should act to protect or promote the health of its members.

Missingness: the condition referred to when missing data results during data collection (Buhi, Goodson, & Neilands, 2008).

Model: a framework or system for organizing concepts into a meaningful schema; a conceptual model is a paradigm (Taber, 2001). Models are often thought of as
illustrations of paradigms, as they relate the concepts and theories to form paradigms.

Normative Beliefs: The beliefs underlying a person’s subjective norm are called *normative beliefs*. Normative beliefs are the person’s beliefs that specific individuals or groups think he/she should or should not perform the behavior. Thus, the subjective norm may exert pressure to perform or to not perform a given behavior, independent of the person’s own attitude toward the behavior.

Occupational Exposure: Skin, eye, mucous membrane or parenteral contact with blood or other potentially infectious materials that may result from performing job-related duties.

Paradigm: “an example that serves as a model; a conceptual model” (Taber, 2001). A paradigm is a basic structure and framework that can form the basis for a way of thinking (belief system or philosophy).

Percentile: describes the position of a score.

Perceived behavioral control: a measure of perceived control over the behavior; concept similar to self-efficacy (Coreil, Bryant & Henderson, 2001).

Power: the probability of detecting a difference or relationship if such a difference or relationship really exists; the likelihood of rejecting the null hypothesis (avoids a Type II error; Munro, 2005).

Probability value (p value): the likelihood of obtaining the value of the statistic by chance alone, when conducting a statistical hypothesis test.

Right: a claim that is socially accepted that an individual is entitled to make in a specific circumstance.
Risk: The possibility of suffering harm or loss; danger. To expose to a chance of loss or damage; hazard.

Self-efficacy: a person’s judgment about their own ability to perform a task or goal successfully.

Severity: component of the Health Belief Model (HBM); an individual’s perception of the severity of a disease.

Significance Level (alpha): probability of rejecting a true null hypothesis (making a Type I error; Munro, 2005).

Skewness: a measure of the shape of an asymmetrical distribution.

Social Justice: argues that public health is a public matter and health outcomes reflect the decisions that a society makes for its citizens. There is fairness in the distribution of benefits and burdens throughout society.

Standard Precautions: Integrate and expand the elements of universal precautions in the standard of care designed to protect DHCPs and patients from pathogens that can be spread by blood or any other body fluid, excretion, or secretion. These apply to contact with blood, all body fluids, secretions, and excretions (except sweat), regardless of whether they contain blood, non-intact skin and mucous membranes.

State Licensure: A process of written and skill-based testing to allow a person to practice dentistry or dental hygiene in a state.

Stigma: The prick or mark of a pointed instrument, a spot, mark; a mark made with a burning iron; a brand; any mark of infamy or disgrace; sign of moral blemish; stain or reproach caused by dishonorable conduct; reproachful characterization; a mark or blemish upon someone or something (UNAIDS, 2004 November 11);
a process of devaluation of people either living with or associated with HIV/AIDS (UNAIDS, 2004 January 16).

Subjective Norm: one’s belief about whether most people approve or disapprove of the behavior.

Summative Rating Scale: a group of items that are approximately equal on attitude value where subjects respond in terms of agreement or disagreement. The Likert scale is a type of summative rating scale (McDermott & Sarvela, 1999).

Supervision—Direct: supervision whereby a dentist diagnoses the condition to be treated, a dentist authorizes the procedure to be performed, a dentist remains on the premises while the procedures are performed, and a dentist approves the work performed before dismissal of the patient.

Supervision—Indirect: supervision whereby a dentist authorizes the procedure and a dentist is on the premises while the procedures are performed.

Supervision—General: supervision whereby a dentist authorizes the procedures which are being carried out but need not be present when the authorized procedures are being performed. The authorized procedures may also be performed at a place other than the dentist's usual place of practice. The issuance of a written work authorization to a commercial dental laboratory by a dentist does not constitute general supervision (State of Florida, Florida Statutes 466.003, 2004; ADHA, 2007).

Susceptibility: component of the Health Belief Model (HBM); an individual’s assessment of their susceptibility to the disease.
Universal Precautions: Based on the concept that all blood and body fluids may be contaminated with blood and should be treated as infectious substances (CDC, MMWR, 2003, 52, No. RR-17).

Vulnerable Populations: Social groups who a) have an increased susceptibility or higher than national average risk for health-related problems, and b) experience differential patterns of morbidity, mortality, and life expectancy as a result of fewer resources and exposure to risks (Dyer, 2003).
Chapter Two

Review of the Literature

To understand the background for studying dental hygienists in Florida, relevant literature is presented in the areas of the history of the HIV/AIDS epidemic in the United States and Florida, oral health, at risk populations and oral health disparities, the current state of the field of dentistry/dental hygiene including laws and regulations, and attitudes, intentions and behaviors toward treating patients with HIV/AIDS. Factors for not treating HIV/AIDS patients also will be explored.

Historical Overview of the Epidemic in the United States

On June 5, 1981, the Centers for Disease Control and Prevention (CDC) issued the first warning about a rare form of pneumonia (*pneumocystis carinii*) among gay men (ages 29-36 years) in Los Angeles, a condition later found to be related to AIDS (CDC, MMWR, 1981 June 5). Then on July 4, 1981, the CDC reported that 26 homosexual men (20 in New York City, and 6 in California) had been diagnosed with Kaposi’s sarcoma, an uncommon malignancy in the United States (CDC, MMWR, 1981 July 4). Following up on the cases of Kaposi’s sarcoma, the CDC reported in *Morbidity and Mortality Weekly Report (MMWR)* on August 28, 1981, that 15 more homosexual men had been diagnosed with *pneumocystis carinii* pneumonia (PCP), and an additional 70 more cases had been reported to the CDC with both of these conditions. The majority of these cases...
occurred in white men who were 25 to 49 years of age. Before June 5, 1981, Kaposi’s sarcoma had been seen only in elderly white men of Mediterranean origin.

AIDS incidence in the United States increased rapidly during the 1980s, peaked in the early 1990s, and then declined. The reason for this peak of new diagnoses was the expansion of the AIDS surveillance case definition in 1993 that recognized associated clinical conditions in women. By 1996, reported AIDS incidence and deaths declined due to the advent of highly active antiretroviral therapies (HAART), and AIDS incidence and deaths finally leveled off by 2000. AIDS prevalence, however, continued to increase, and by the end of 2003, an estimated 405,926 persons in the U.S. were living with AIDS (CDC/HIV/AIDS Surveillance Report, 2003, Vol. 15).

In the early 1980s, nearly all AIDS cases were diagnosed in males, but by 2003, only 73% of all AIDS cases and 70% of all HIV cases were diagnosed in adult and adolescent males (CDC/HIV/AIDS Surveillance Report, 2003, Vol. 15). During the same time period, cases among black males and females increased steadily, and by 1996, more cases occurred among blacks than any other racial/ethnic population. In 2003, 49% of all new AIDS cases and 50% of all new HIV cases in the U.S. were diagnosed in blacks (CDC/HIV/AIDS Surveillance Report, 2003, Vol. 15).

A steady increase in HIV-infection and developing AIDS cases has occurred among women since 1985. The number of women with AIDS in the U.S. rose from 7% in 1985 to 31% in 2003. Minority women in America are disproportionately affected by AIDS. Of the adult and adolescent AIDS cases reported in women in 2003, 63% were among blacks and 18% were among Hispanics.
The most common mode of exposure among persons reported with AIDS has been male-to-male sex, followed by injection drug use and heterosexual contact (CDC/HIV/AIDS Surveillance Report, 2005, Vol. 16). AIDS incidence increased rapidly in all of these risk categories through the mid-1990s (CDC/HIV/AIDS Surveillance Report, 2005, Vol. 16). From 2000 through 2004, the estimated number of AIDS cases increased among MSM, and also increased among persons exposed via heterosexual contact (CDC/HIV/AIDS Surveillance Report, 2005, Vol. 16). These two transmission categories accounted for 80% of all HIV/AIDS cases that were diagnosed in 2004.

In the United States, approximately half of the 40,000 new HIV infections annually are among African-Americans; and the proportion of total HIV cases among women is increasing faster in the U.S. than in any other country CDC/HIV/AIDS Surveillance Report, 2003, Vol. 15). In fact, U.S. women accounted for 30% of the total number of HIV cases nationally through 2004 (CDC/HIV/AIDS Surveillance Report, 2003, Vol. 15). Proportionally, more cases of AIDS are located in the South (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia) as compared to the Northeast, West, and Midwest (Florida AIDS Action, 2002; The Henry J. Kaiser Family Foundation, 2004). By the end of 1998, the profile of newly reported AIDS cases among women looked like this: 44% were in the South, 61% were among black women, and 38% had been transmitted heterosexually (Florida AIDS Action, 2002; Hader, Smith, Moore, & Holmberg, 2001; UNAIDS, 2004; The Henry J. Kaiser Family Foundation, 2004).
From 1981 through 2003, there were 929,985 AIDS cases reported in the United States, of which 337,409 (36%) cases were located in the South (CDC/HIV/AIDS Surveillance Report, 2005, Vol. 16). In addition, 221,065 cumulative HIV cases had been reported during the same period. HIV case reporting was initially legislated in three states (Colorado, Minnesota, and Wisconsin) in 1985 and has since grown to 37 states and 4 U.S. territories that are reporting HIV cases. Five million new HIV cases were reported worldwide in 2003, the most cases reported in any single year since the epidemic began (Kaiser Daily Reports, 2004, July 9).

*Florida and HIV/AIDS*

Whereas Florida’s image is one of paradise, it is not paradise for the growing number of residents who suffer from poverty, health problems and a lack of access to health care and social services. According to the Florida Department of Health (FDOH), a major five-year goal is to treat infectious diseases of public health significance (Dyer, 2003). One infectious disease, HIV/AIDS, is among the state’s top 10 causes of death.

From 1981 to 2003, Florida ranked third in the nation in the total number of reported adult and adolescent AIDS cases with 94,725 (The Henry J. Kaiser Family Foundation, December, 2004). The HIV statistics are even more staggering with Florida ranking second behind New York for confidential name-based HIV infection reporting for all ages (27,913). The startling issue here is that Florida has had confidential name-based HIV infection reporting only for *new* diagnoses since July 1997. Florida has followed the same racial and population profiles as the nation with one exception. The
exception is that the percentage of women diagnosed with HIV/AIDS in Florida is higher than for the U.S. as a whole (Florida Department of Health, 2005).

In 1994, women accounted for 22% of reported AIDS cases in the U.S. (CDC/HIV/AIDS Surveillance Report, 2003, Vol. 15). By 2004, that figure rose to 30% (CDC/HIV/AIDS Surveillance Report, 2005, Vol. 16). Of the AIDS cases diagnosed among Florida women reported through 2003, 72% were black, 17% were white, and 10% were Hispanic. An almost identical picture existed for Florida women with HIV where 72% were black, 16% were white, and 11% were Hispanic (Florida Department of Health, 2003).

The number of women in Florida diagnosed with AIDS through 2003 exposed through heterosexual contact increased to 52%, whereas 24% were injection drug users. The profile for women in Florida with HIV during the same period was similar with 53% reporting heterosexual contact, and 11% reporting injection drug use. HIV infection was the third leading cause of death among women ages 25 to 44 years in Florida, and the leading cause of death among black women in this age group (Florida Department of Health, 2005).

The number of perinatally acquired AIDS cases peaked in the U.S. in 1992 (952), and has continued to decline in 2003 (59). The number of HIV/AIDS cases in infants and children is identical for the U.S. and Florida remaining at 1% of the total number of perinatally acquired cases (Florida Department of Health, 2005).

The picture of HIV/AIDS epidemiology in Florida is grim with a growing number of minorities contracting HIV. Therefore, it is critical to examine what underlies this growing trend.
Table 2.1

Percent of Persons Living with AIDS: U.S. and Florida by Gender, Race & Mode of Transmission, 2003*

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>U.S.</th>
<th>Florida</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=403,928</td>
<td>N=42,861</td>
</tr>
<tr>
<td>Male</td>
<td>78%</td>
<td>73%</td>
</tr>
<tr>
<td>Female</td>
<td>22%</td>
<td>27%</td>
</tr>
<tr>
<td>White</td>
<td>36%</td>
<td>35%</td>
</tr>
<tr>
<td>Black</td>
<td>42%</td>
<td>48%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>20%</td>
<td>16%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>MSM</td>
<td>46%</td>
<td>43%</td>
</tr>
<tr>
<td>IDU</td>
<td>25%</td>
<td>16%</td>
</tr>
<tr>
<td>MSM/IDU</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Heterosexual</td>
<td>22%</td>
<td>36%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>1%</td>
</tr>
</tbody>
</table>

*Source: CDC, HIV/AIDS Surveillance Report, 2005; Vol. 16; data as of 12/31/03. FL = 10.6% of total number of persons living with AIDS in the U.S.

Racial and Ethnic Disparities in Health Care

An issue brief from the Kaiser Family Foundation (March, 2005), stated that racial and ethnic disparities in health care such as insurance coverage, access, or quality of care, are among the many factors producing inequalities in health status in the U.S. today. Health disparities began with the contentious history of race relations in America, and continued with unequal and separate laws enacted by the government. Until the mid-1960s, racial separatism was promoted by separate bathrooms and water fountains for blacks and whites. Poverty among minorities kept young people out of school, and college, so there were few culturally similar health care providers for African Americans. The enactment of Medicaid and Medicare in 1965, along with the enforcement of the 1964 Civil Rights Act, made an enormous difference in reducing the health care division
in the U.S. But African Americans again lost trust both in the government and in the health care system in 1972, when the Tuskegee Study was revealed.

**Elimination of Health Disparities**

Whereas closing the gap of health disparities among minority populations is an arduous task, it has been targeted by *Healthy People 2010* as a major goal. The second goal of *Healthy People 2010* is to eliminate health disparities including differences that occur by gender, race or ethnicity, education or income, disability, geographic location, or sexual orientation. The momentum to address health care disparities grew largely in response to the step taken by the U.S. Department of Health and Human Services (USDHHS) in 1999 when it established a national goal to eliminate health disparities by the end of this decade. The ways in which health disparities can occur among various demographic groups in the United States are highlighted below.

**Race and Ethnicity**

Current information about the biologic and genetic characteristics of African Americans, Hispanics, American Indians, Alaska Natives, Asians, Native Hawaiians, and Pacific Islanders does not explain the health disparities experienced by these groups compared with the white, non-Hispanic population in the United States. These disparities are believed to result from the complex interaction among genetic variations, environmental factors, and specific health behaviors. For example, the death rate from HIV/AIDS for African Americans is more than seven times that for whites (USDHHS, 2000).
Income and Education

Dissimilarities in income and education underlie many of the health disparities in the United States. Income and education are fundamentally related and often serve as proxy measures for each other. In general, population groups that have the highest poverty rates and the least education also experience the worst health status. Disparities in income and education levels are associated with differences in the occurrence of illness and death that include heart disease, diabetes, obesity, HIV/AIDS, elevated blood lead level, and low birth weight (USDHHS, 2000). Higher levels of education also may increase one’s likelihood of obtaining or understanding health-related information needed to develop health-promoting behaviors and beliefs in prevention. Higher incomes allow for increased access to medical care, enable people to afford better housing and live in safer neighborhoods, and increase the opportunity to engage in health-promoting behaviors. The percentage of people in the lowest income families report that limitation in activity caused by chronic disease is three times that of people in the highest income families (USDHHS, 2000).

Poverty

There are distinct demographic differences in poverty by race, ethnicity, and household composition as well as geographical variations in poverty across the United States. The South has the highest rates of poverty in the nation (Collaborative Solutions, Inc., 2005). According to the Center for Disease Control and Prevention, the South also has more estimated living AIDS cases and more AIDS-related deaths than any other region in the country (Collaborative Solutions, Inc., 2005). Whereas African Americans comprised only 19% of the South’s population through 2003, 61% of the new AIDS
cases in the South were among African Americans. This disproportionate infection rate combined with the South’s high rates of other sexually transmitted diseases, and the highest proportion of non-urban dwellers combine for a major public health challenge (Collaborative Solutions, Inc., 2005).

Disabilities

People with disabilities are identified as persons having an activity ‘limitation, who use assistance, or who perceive themselves as having a disability. People with disabilities tend to report more anxiety, pain, sleeplessness, and days of depression and fewer days of vitality than do people without activity limitations. People with disabilities also have other disparities, including lower rates of physical activity and higher rates of obesity (Collaborative Solutions, Inc., 2005). Many people with disabilities also may lack access to health services, and medical and dental care (Collaborative Solutions, Inc., 2005).

Whereas reducing health disparities through practice and research has been a major priority of the National Institutes of Health (NIH) for several years, progress toward this goal has been less than optimal. Mann (1998) believed that the primary contributors to health disparities were lack of resources, discrimination, and violation of human rights. Moreover, economic status, discrimination, diverse cultural backgrounds, and access to care have not always been present in existing plans and strategies to reduce health disparities (Flaskerud, 1998).

In 1998, President Clinton made a national commitment to eliminate health disparities between racial and ethnic groups by 2010 in six areas, one of which is
HIV/AIDS. When *Healthy People 2010* was published, this paradigm shift became
official policy.

*Healthy People 2010*

*Healthy People 2010* goals are firmly committed to the principle that every person
in every community across the nation deserves equal access to comprehensive, culturally
competent, community-based health care systems that serve the needs of the individual
and the community. It provides a framework for prevention for the United States
(USDHHS, 2000). It is a statement of national health objectives that is designed to
identify the most significant and preventable threats to peoples’ health, and to establish
national goals to reduce these threats. Leading Health Indicators (LHIs) are being used to
measure the nation’s health over this decade, and to reflect the major health concerns in
the United States at the beginning of the 21st century. These ten LHIs were selected
based on their ability to motivate action, and their importance as public health issues.

Achieving health equity is one of two goals of *Healthy People 2010*. The greatest
opportunities for eliminating health disparities lie in empowering individuals to make
informed health care decisions, and in promoting community-wide safety, education, and
access to health care. One of these LHIs (number 10) is Access to Health Care and
applies to this dissertation.

In addition, *Healthy People 2010* provides a set of measurable oral health
objectives that are part of the overall set of national health objectives. These objectives
and their benchmark statistics allow assessment of progress and improvement toward
reaching the above goals. Three of the 28 focus areas of *Healthy People 2010* apply to
focus areas 1 (Access to Quality Health Services), 13 (HIV), and 21 (Oral Health). Applicable objectives are listed below for each focus area.

Focus Area 1: Access to Quality Health Services
Goal: Improve access to comprehensive, high-quality health care services.
Objective Number and Short Title
Primary Care:
1-4 Source of ongoing care
1-5 Usual primary care provider
1-6 Difficulties or delays in obtaining needed health care
1-7 Core competencies in health provider training
1-8 Racial and ethnic representation in health professions

Focus Area 13: HIV
Goal: Prevent HIV infection and its related illness and death
13-13 Treatment according to guidelines

Focus Area 21: Oral Health
Goal: Prevent and control oral and craniofacial diseases, conditions, and injuries and improve
21-10 Use of oral health care system

Determinants of Health

The determinants of health (individual biology and behavior, physical and social environments, policies and interventions, and access to quality health care) have a profound effect on the health of individuals, communities, and the nation. For example, environmental factors and individual behaviors are responsible for about 70% of all premature deaths in the United States. Individual biology and behaviors influence health interacting with each other and with the individual’s physical and social environments. Additionally, policies and interventions can improve health by targeting factors related to individuals and their environments, including access to quality health care (see Figure 2.1). When policies are developed and preventive interventions are implemented that
address the determinants of health effectively, the burden of illness can be reduced, quality of life can be enhanced, and longevity can be increased.

Individual and community health depends greatly on access to quality health care. Expanding access to quality health care is important to eliminate health disparities and to increase the quality and years of healthy life for all Americans. Health care broadly includes services received through health care providers, and health information and services received through other community venues.

Figure 2.1 Determinants of Health

Access to Quality Health Services

Attention to racial and ethnic differences in health status and access to care have increased markedly during the last decade (Kaiser Family Foundation, 2004). Notable differences in health status between white women and women of color, particularly African American women include:

- Women of color are more likely to report that they are in fair or poor health;
- African American women are more likely to have a physical condition that limits routine activities such as participating in work or school, and
- Latina women are less likely to report a chronic condition in need of ongoing care.

Compared to whites, race and ethnicity are factors in women’s chronic disease status:

- African American’s have twice the rate of hypertension for women ages 45-64;
- African American women have significantly more arthritis than Latinas and whites;
- Both African American and Latina women have higher prevalence of diabetes;
- African American women are more likely to have HIV/AIDS;
- Latinas report problems in obtaining childcare that results in delayed or unmet health care;
- Difficulties in finding time, or taking time off work was experienced by one-quarter of women in all racial and ethnic subgroups;
- Depression and anxiety are experienced pretty equally among racial and ethnic subgroups.
Cultural competence is inextricably tied to quality of care and is a cross-cutting issue that affects all service delivery systems and providers. Providers must be aware of their own cultural values and beliefs and recognize how they influence their attitudes and behaviors. The meaning of cultural competence goes beyond cultural sensitivity to a level where this sensitivity is integrated into the planning, implementation, and evaluation of service systems and encompasses cultural diversity (Denboba, 1998). Reducing disparities in health care will require an emphasis on assuring access to both culturally and technically competent care (The Henry J. Kaiser Family Foundation, 2005).

Financial, structural, and personal barriers can limit access to health care. Financial barriers include lack of health insurance, lack of enough health insurance to cover needed services, or lack of finances to cover services outside a health plan or insurance program. Structural barriers include not having primary care providers, medical specialists, or other health care professionals to meet special needs, or the lack of health care facilities. Personal barriers include cultural or spiritual differences, language barriers, not knowing what to do or when to seek care, or concerns about confidentiality or discrimination (USDHHS, 2000).

There is increasing evidence that the underlying racial and ethnic disparities in health care extend beyond any logistic and economic factors. In a large-scale analysis of racial and ethnic inequities, the Institute of Medicine (2002) concluded that evidence suggested that bias, prejudice, and stereotypical beliefs on the part of healthcare providers may contribute to the differences in care. To curb these disparities, greater efforts must be made to increase the number of African American and Latino health care providers.
involved in HIV/AIDS treatment and research (Smith, Orgain, & Scott, 2004). More clinicians of color may also help to mitigate the lingering mistrust of the medical community among African Americans. Clinicians of other cultures must also learn to deliver culturally competent care in an environment that is safe and comfortable. Culture influences: (1) how health, illness and disability are perceived; (2) attitudes toward health care providers, facilities, and how health information is communicated; (3) help seeking behaviors; (4) preferences for traditional versus non-traditional approaches to health care, and (5) perceptions regarding the role of families in health care (Denboba et al., 1998). The Denboba et al. (1998) findings are supported by a recent study of Hispanics and their access to and attitudes towards oral health care by Vazquez and Swan (2003) revealing that only 2% of the dentists located in Wichita, Kansas were of Hispanic origin. Moreover, none of them spoke Spanish, although some dental offices provided Spanish/English translation. Several other authors have identified barriers and attitudes that affect access to health care within minority populations. The barriers and attitudes include low education level coupled with cultural values and beliefs, language, lack of access to service, lack of dental/health insurance, low income, lack of recognition of oral health care, acculturation, and inaccessibility to health providers of the same ethnicity (Aday & Forthofer, 1992; Manski & Magder, 1998; Spector, 2000; Waldman, 1992).

When examining the issue of racial disparity in HIV care and treatment, researchers found that some clinics and states have made progress in reducing disparity through a variety of programs (AIDS Alert, 11/01/02). One promising strategy was found to be contracting with minority community-based organizations to conduct treatment, education and outreach.
Access to Oral Health Care

The changing face of the HIV epidemic has increasingly affected poor people of color, populations that historically have experienced lack of access to oral health care. Therefore, the New York State Department of Health AIDS Institute (2001) advised that health care providers ensure that every patient receiving treatment for HIV/AIDS have a culturally competent source of oral health care that is conveniently located with variable office hours. To assist this effort, the New York State Department of Health AIDS Institute (2001) wrote an oral health clinical guide for primary care practitioners that included the following recommendations:

- Oral health care services should be fully integrated into other available primary care services for HIV-infected patients.
- Structural, financial, personal, and cultural barriers should be considered and addressed by the oral health care staff to ensure adequate access to oral health care services.
- Every patient should receive a comprehensive initial examination that includes a medical and social history, and chief complaints.
- Extraoral head and neck examinations and oral soft tissue exams should be performed at each visit.
- A comprehensive dental treatment plan that includes preventive and maintenance care should be developed and discussed with the patient, and that any modifications to the treatment plan should be based on the patient’s general medical status rather than the patient’s HIV/AIDS status.
• The dental provider should immediately communicate to the patient’s medical provider any clinical findings that may indicate a change in the patient’s systemic health, or planned procedures that may impact their systemic health.

Oral Health, At Risk Populations, and Oral Health Disparities

An editorial in the January 2002 issue of the American Journal of Public Health featuring an oral health theme, begins with the vital concern: The focus on oral health is critical (p.9), and documents the pressing oral health needs of underserved populations (Beetstra, Derksen, Ro, Powell, Fry, & Kaufman, 2002; Zabos, Northridge, Ro, Trinh, Vaughan, Howard, Lamster, Bassett, & Cohall, 2002). The most disadvantaged populations include people of color, the working poor, and people with chronic illnesses and disabilities, populations that have previously been found to be underrepresented in household surveys (Zabos et al, 2002). The researchers sampled people who lived in dwellings and places that are often missed by conventional U.S. census listing protocols such as single-room occupancies, cars and cardboard boxes. Zabos et al. (2002) found that the most commonly self-reported health complaint among adults in Harlem, New York was problems with their teeth and gums (30%).

In May 2000, Oral Health in America: A Report of the Surgeon General was released (NIH, NICDR, 2000). In this report, the Surgeon General states, “All Americans can benefit from the development of a National Oral Health Plan to improve quality of life and eliminate health disparities by facilitating collaboration among individuals, health care providers, communities and policymakers at all levels of society and by taking advantage of existing initiatives (p.2).” This call for new efforts to eliminate
disparities in oral health status and rates of oral disease particularly reveals the hidden epidemic of dental and oral diseases that largely affects poor people of color and those with chronic illnesses and disabilities (NIH/NIDCR, 2000; Zabos et al, 2002). The report stresses the serious consequences that poor oral health has on a person’s overall health and well-being. For example, adults in Harlem suffer from a high excess morbidity and mortality, yet little is known about the prevalence of oral disease in the population. It is no secret that New York has the highest number of reported cases of HIV and AIDS in the U.S.

Building on the *Oral Health in America* report, the National Oral Health “Call to Action” is an important document that creates a broadly shared vision and fosters collaboration to promote oral health, and thereby general health and well-being. It promotes a focus on preventing oral disease, providing appropriate care and access to needed services. The two major goals of the National Oral Health Call to Action are consistent with those in the Surgeon’s General’s report:

- To eliminate oral health disparities, and
- To improve quality of life.

One of the guiding principles that pertains to providing oral health services and promoting health at the individual and community level is to seek social equity. The key action element that upholds this principle and that relates to this study is to remove known barriers between people and oral health services (NIH/NIDCR/U.S. Surgeon General David Satcher, May 25, 2000).

Shiboski, Palacio, Neuhaus, and Greenblatt (1999) found that many HIV+ women have gone without dental care because of fear of dentists, lack of information regarding
available dental care, unemployment, injection drug use and a perception of poor oral health. Among the 43% of these women who had not received dental care in the past year, the main reasons for not seeking care were discomfort with or fear of dentists (27%), not making an appointment or not knowing which dentist to visit (21%), having financial issues or problems with insurance coverage (16%), and feeling discriminated against (9%). The perceived barriers faced by caregivers in obtaining dental care for their children on Medicaid included excessive waits, demeaning interactions with front office staff, negative interactions with and lack of time with dentists, and discrimination because of being enrolled in Medicaid. In addition, other barriers that impeded access to dental care were difficulty in finding a practitioner, difficulty in scheduling appointments, and inconvenient and unreliable transportation (Mofidi, Rosier, & King, 2002). The majority of persons with HIV/AIDS are minorities, and many of them receive their health care through Medicaid. When an HIV-infected individual is uninsured and is not covered under any other means, the Ryan White Care Act is the payor of last resort, and will pay for dental care when funding allows. As stated previously, few practitioners are willing to treat HIV+ patients under this payor source. Key findings from focus groups of women living with HIV/AIDS in Philadelphia, Los Angeles, Miami, and Savannah reveal that stigma and discrimination persist, especially with dental providers (Lake Snell Perry & Associates, Inc., 2003).

What it Means to be HIV+

HIV/AIDS affects the lives of thousands in North America. In the U.S., HIV/AIDS has been associated with intravenous drug users, gay men, racial or ethnic
minorities, and sex workers. Fear of HIV/AIDS in American society suggests that HIV/AIDS is an illness with a triple stigma, that is, it is connected to stigmatized groups; it is sexually transmitted; and, it is a terminal and wasting disease.

HIV/AIDS is a socially constructed disease. In the evolution of the social construction of HIV/AIDS, certain risk groups became associated with the disease. Because of their sexual orientation, drug use, race, or class, these groups are perceived to be at risk, whereas anyone who is not affiliated with these groups is largely excluded from the public dialogue surrounding HIV/AIDS. HIV/AIDS in women provides an example of how the social construction of this illness may have serious social and medical implications for those who do not fit within the risk group categories.

I am such the middle-American woman, I could be your daughter, I could be your Midwestern daughter who you have always felt so good about, who has always been upright and a good citizen and a nice girl and a mom and married, and all those things. If I told you I’m HIV+, you would be shocked (Grove, Kelly & Liu, 1997).

Persons living with HIV/AIDS experience hope, despair and hopelessness as distinguished by Kylma, Vehvilainen-Julkunen, and Lahdevirta (2001). Hope is important in facing the prospect of living with a chronic disease such as HIV/AIDS (Katz, 1997) and helps in major stressful events and alleviates emotional distress (van Servellen, Sarna, Padilla, & Brecht, 1996). On a general level, despair and hopelessness are connected to suffering, as is the concept of “losing” with this disease (Kylma, Vehvilainen-Julkunen & Lahdevirta, 2001). Losing, or loss of joy, carefree time in life,
safety, self respect and trust in oneself, other people, control over one’s life, and systems are a few examples of what persons with HIV/AIDS have experienced.

For years we’ve had the government telling us what to do. We’ve had social workers and organizations telling us what to do, doctors—all saying, This is in your best interest, and This is best for you, and We know exactly how you feel. And they haven’t got a bloody clue because they’re not living with it (Whittaker, 1992).

Their experience is one of enormous upheaval due to the uncertainty of a disease with vague symptoms, changing medical management, and social stigma (Katz, 1996). First and foremost are those living with HIV infection, but who have not been tested. Weitz (1989) looked at uncertainty in a cohort of homosexual men and identified that many of them suspected they were HIV+ but had not been tested. The lack of confirmation of their serostatus was a significant source of their uncertainty, and that after their HIV infection was confirmed, they began to identify methods to cope with the uncertainty. Much of the uncertainty concerned the unpredictable nature of the disease, the long asymptomatic period following infection with the virus, and the often vague and confusing symptoms associated with opportunistic infections. The potential impact of stigma on HIV+ individuals was documented by Laryea and Gien (1993) with respondents reporting that the uncertainty about their lives was coupled with intense fear of disclosure and rejection. Katz (1996) found that (1) all respondents described being diagnosed with HIV as a pivotal life event, and for some the diagnosis was a shock; (2) living with HIV was their impetus to begin looking at themselves with honesty and the world around them more clearly, and (3) persons living with HIV infection formed a new
perspective on life, which is maintained through five core experiences. These experiences included surviving the HIV diagnosis, taking care, living in the present, seeking support, and appreciating the positive. Respondents indicated personal growth as a result of having this disease, and had a firm belief that this growth would not have happened without HIV as an impetus.

Regardless of gender, ethnicity, class or sexual orientation, the prevailing stereotypes of AIDS stigmatize persons with HIV/AIDS as immoral (Stanley, 1999). Stigma damages or spoils identity by marking the person as having an essentially deviant disposition. A flawed identity interferes with or actually disqualifies the stigmatized person from full participation in normative roles, statuses, and social relations. Therefore, many HIV+ persons fear the stigmatization and struggle with the discrediting implications of their serostatus.

The following quotations are excerpted from vignettes in books that demonstrate some of what it means to be HIV+. The first person is a client of an HIV/AIDS comprehensive community-based service program in the Tampa Bay area who was infected through sex and who was diagnosed in 1993. She says:

I don’t blame anyone. It was my own responsibility. I should have used protection, even though at the time I was infected there was no talk of women getting AIDS. We were the silent population becoming infected. That makes me mad. All of the HIV-positive women I know have gynecological problems and none of the doctors really understand the connection to HIV. When I started to have problems I went to see a doctor. I told him I was positive and he put this big, red sticker on my chart saying I was positive. I was lying in the stirrups
when he came in. He said, ‘Remind us when you come in to tell us that you’re positive so we can take extra precautions….so that we can put hazardous material in a proper container.’ After the exam he walks out. The nurse comes in and tells me I can get dressed. Then she told me to take the paper off the table and put my gown in a hazard bag. I dressed and left my gown and the table paper right where they were. Then I told the doctor ‘I will never step foot in your door again, and I will make sure every HIV caseworker in Pinellas County knows how ignorant you are so no woman will ever have to be insulted by you.’ And that is what I did (Huston & Berridge, 1997, p.80).

Another woman, infected through sex, and diagnosed in September 1994 says:

It’s almost like AIDS gives me some kind of freedom. Like it can’t get any worse, so go for it. I have nothing to lose. Risks are not so risky, especially emotional risks. Before HIV, I wasn’t very assertive. I say what I feel now. AIDS has definitely made me a lot stronger (Huston & Berridge, 1997, p.35).

A 33-year-old advertising executive said:

I think every HIV+ person goes through it and some don’t get out of it; that this is the end. Why bother getting teeth fixed because you’re going to be dead. Why bother doing this because you’re going to be dead? Well, I got over that stage (Katz, 1996, p. 55).

A father stated:

My foster son, Michael, aged 8, was born HIV-positive and diagnosed with AIDS at the age of 8 months. I took him into our family home, in a small village in southwest England. At first relations with the local school were wonderful and Michael thrived
there. Only the head teacher and Michael’s personal class assistant knew of his illness. Then someone broke confidentiality and told a parent that Michael had AIDS. That parent, of course, told all the others. This caused such panic and hostility that we were forced to move out of the area. The risk is to Michael and us, his family. Mob rule is dangerous. Ignorance about HIV means that people are frightened. And frightened people do not behave rationally. We could well be driven out of our home yet again (UNAIDS/WHO, 2003, p.31).

Living in rural communities posed some mind-boggling circumstances for two women who were being diagnosed with HIV. A pregnant woman was asked quite forcefully by her doctor to have an abortion, which she ultimately decided to do (Whetton-Goldstein, 2002, p.97). When another woman’s husband was tested for HIV after a car accident, the physicians encouraged her to be tested also, but she was too scared. She was tested two years later when a physician who was treating her, stuck himself with a needle that he had used on her. After she left, the doctor began to worry about the possibility of contracting HIV.

So then, after that, I had a whole lot of police cars come to the house … and that scared the life out of me because I didn’t know what was going on. They told me that I needed to go to the hospital, and they escorted me to the hospital. I thought I had done some kind of crime or something (Whetton-Goldstein, 2002, p.98). The manner in which this last woman was taken to the hospital for HIV testing without giving her an explanation, and the manner in which the pregnant woman was forced into having an abortion indicates the extent of ignorance in rural communities, where people
often react from fear, and without understanding the issues of confidentiality and patients’ rights.

Ken worked as a marketing executive for a large health insurance company, and had not told any of his coworkers about having the HIV infection. He believed that the virus did not affect his work performance, or pose any health risk to his coworkers, but he did worry that someone at work could access his health insurance records and discover his HIV status. Other personal friends knew of his diagnosis, but he waited more than one year after his partner died of AIDS, to attempt to begin another relationship. He now feels strongly that if he is going to have sex with someone, his partner will be told of Ken’s seropositivity and that they must use condoms (Derlega & Barbee, 1998, p.5).

Lori told of her sexual pattern:

If I have intercourse, I tell [the person] I am positive. That’s why I don’t want to meet people or meet a new man. Because I go through a lot of wondering if I should tell ‘em, or what should I do, how they going to react. I don’t like meeting. But when I do, I’ll be with them for awhile before I have sex with them. You know I tell them before that. You know if I feel like I’m going to have sex, I tell them, “You know it’s on you now, you do what you want to do, but I’m HIV-positive.” So whoever I been with knows (Whetten-Goldstein & Nguyen, 2002, p. 116).

In an article Living with an HIV Diagnosis (AIDS Alliance For Children, Youth & Families, 2003, pp. 1,3), a 25-year-old woman wrote:

I am HIV positive. The first time I said it out loud was an experience that compared with no other. Being HIV positive was a certainty, and my choices
were either to be disillusioned or to accept it. Up until then, I had known exactly who I was and exactly what it meant to be me. Now I was somehow reinvented. But this reinvention was not part of my life’s plan. For weeks after my diagnosis, I was overwhelmed, under prepared and gasping for air. Eventually my arms stopped flailing, my head stopped spinning, and I began to float. I decided that I wouldn’t struggle against the labels, I would get past the tides of stigma, and I would somehow grab a life jacket of acceptance and save my own life. From the time of my diagnosis until now, I have decided to live life to its fullest. I reached out to my community to continue to heal. I reclaimed my value as a person and as a woman. I became driven with a cause. I was empowered to become a part of the healing process for others. I encourage and challenge anyone reading this whose mind may still be racing to let go. Allow you yourself the chance to live and taste life.

A female friend of mine who is nearing age 50, gave me this perspective on being white and being HIV+:

I think I contracted HIV when the condom broke during intercourse when I was living in Africa. That was in the 1980’s. For years, I avoided being tested for HIV because I was in denial of possibly being HIV-infected. When I finally did get tested, it was my decision. But I knew that it put a veil of stigma and discrimination before me, when there had been none there before. I hardy told anyone about my diagnosis, because of fear, and the stigma and discrimination that it might bring into my life. Then I told my two coworkers. After that, I felt free, like a load had been lifted from me. I worked to regain the confidence that I
had previously felt, and my life opened up. I am now an advocate for those with HIV/AIDS and feel like this has been given to me as part of my mission in life (personal communication, September, 2001).

Another friend of mine turned a difficult life situation into a career of teaching persons with HIV/AIDS how to live successfully with the disease. He is a long-term survivor of AIDS, has extensively researched his medical condition, and strictly adheres to his medication regimen. He contracted the virus from his partner of 12 years who was a drug user; both of them were involved in high-risk behaviors. He has been in his current relationship for ten years, and his partner remains HIV-negative. He credits his long-term survival to having access to the latest drug regimens from NIH, to his positive attitude and actions, and to keeping actively engaged in teaching and advocating for those with HIV/AIDS.

I received an email from a local dental hygienist who wrote:

Just thought I would share this tidbit with you. I won't say which office this happened in, but the receptionist (office manager) came into my operatory with a patient's chart and pointed out that the patient indicated on his medical history that he was HIV+. This was my first time seeing the patient, but he was a patient of record for many years and previously had his teeth cleaned by the other hygienist. She told me she was bringing this to my attention in case I wanted to double glove or do anything else since the other hygienist did. I told her I practiced using "universal precautions" and saw no need for her to "point" this out to me. She became slightly defensive implying I was being careless. We respect
one another so it didn't create a disturbance in the office, and I felt I might have educated her a little with my reply (personal communication, September 8, 2005).

A recent study by researchers at the University of California at Los Angeles on HIV stigma among health care workers toward their patients found that perceived stigma in clinical settings may have discouraged individuals from accessing needed health care services (Kinsler, Wong, Sayles, Davis, & Cunningham, 2007). Approximately one-fourth of 233 low income, HIV+ persons in Los Angeles County reported perceived stigma from a health care provider.

AIDS...at home among us, a contorted ally, an alien who lands anywhere, with anyone, anytime. I ask you, would the Almighty feel as alone as I, as angry, afraid and abandoned as I who want to slay this monster named AIDS? What if a pair of wings sprouted through the cotton of your favorite t-shirt and flew you into the arms of a guardian angel. What if...(Tartakoff, Lee, Blanton & Weiner, 1998).

The Dental/Dental Hygiene Profession

Approximately 168,000 dentists, 112,000 registered dental hygienists and 218,000 dental assistants work in the United States (CDC,2003). As reported by the Florida Department of Health (2005), 6,537 dentists, and 7,458 dental hygienists were licensed in Florida as of June 30, 2004. Of these DHCPs, 6,488 dentists and 7,383 dental hygienists were actively practicing, and were bound to follow Florida Law as written in F.S. 466.

Dental hygienists in Florida are required to work under the direct, indirect or general supervision of a dentist (F.S. 466.024). The only tasks or activities that dental hygienists may provide without supervision are educational programs, faculty or staff
training programs, authorized fluoride rinse programs, and other services that do not involve diagnosis or treatment of dental conditions, and are services approved by rule of the board (F.S. 466.023). This means that dental hygienists may not treat patients who are not first seen and examined by a licensed dentist; they are not legislated to be independent practitioners, nor are they in a position to refuse care. In the realm of this study, and bound by Florida Law, dentists are the ultimate decision-makers regarding the treatment of HIV/AIDS patients, and this is a study limitation.

Three documents in the appendix discuss and compare the concepts of direct access, general supervision in the private office, and permitted functions and supervision by 51 states and the District of Columbia. As mentioned in the above paragraph, Florida has general supervision guidelines in the private office, permitted functions that do/do not require the presence of a dentist, but is not a direct access state. Direct access means that a dental hygienist can initiate treatment based on their own evaluation of the patient’s needs and without the specific authorization of a dentist, treat the patient without the presence of a dentist, and can maintain a provider-patient relationship (American Dental Hygienists’ Association, 2007).

_Ethical Practice in Dental Treatment_

The concept of human rights is at the forefront of the ethics literature, and is particularly so in textbook discussions about the duty of providing clinical care to patients with HIV/AIDS (Doyal, 1994b; Reamer, 1991). Ethical principles such as rights, duties and protecting others from harm should be followed in the clinical treatment of patients with HIV/AIDS. Rights are claims which it is socially accepted that persons are
entitled to make in specific circumstances (Doyal, 1997), and precede preferences (Dworkin, 1981). Rights provide moral structure to social and professional life through specifying what people should do in particular situations even when they wish to do otherwise. In performing our duties, we are primarily obligated to take due care and caution about the health and safety of others.

Patients also have rights. People who need dental care are entitled to expect that DHCPs will assume the duty to provide it to an acceptable professional standard. In a clinical sense, the patient’s right to autonomy translates into the doctrine of informed consent (Doyal & Cannell, 1995). Besides informed consent, the moral duty to respect the autonomy of patients also necessitates protecting their confidentiality. If patients are unsure that their privacy will be respected, they will not cooperate in their treatment planning, and may not get dental care at all. In this way, the principle of confidentiality becomes a public health issue. For example, it is in everyone’s interest that those with contagious diseases seek health care rather than avoiding it altogether because of their fear of unwanted public disclosure. DHCPs would expect high standards of privacy for their own treatment. Patients have a right to expect the same.

Patients should be treated fairly and without discrimination. Discrimination based on the type of need with which patients present is professionally unacceptable, as it is because of their race, creed or color (Rule & Veatch, 1993). Professional practice demands courage of its DHCPs, that is, their willingness to try to solve the patients’ problems in the face of personal risk.

Dentists have the responsibility to treat HIV+ patients without bias or discrimination (Schulman, 1993). The law states that a workplace of public
accommodation such as the dental office requires treating patients with disabilities (HIV infection is included in the legal definition of disability). Therefore, HIV+ patients are protected by the ADA and other court decisions (Shultz v. Hemet Youth Pony League, Inc., 943 F Supp. 1222 (C.D. Cal. 1966); Anderson v. Little League Baseball, Inc., 794 F Supp. 342 (D. Ariz. 1992); U.S. v. Morvant, 898 F. Supp. 1157 (E.D. La. 1995) which established that a dentist’s referral of HIV+ patients to another provider who supposedly specialized in treatment of such dental patients could be a pretext for unlawful discrimination if neither the dentist nor his/her staff examined the patients’ mouths. Other court decisions did not support the findings of a dentist’s belief that an HIV+ patient posed a direct threat to him and his staff, citing that available medical knowledge and implementation of universal precautions significantly mitigated any risk posed by the patient (Bragdon v. Abbott, 118 S. Cr. 2196 (U.S. 1998); U.S. v. Morvant, 898 F. Supp. 1157 (E.D. La. 1995). Every health care professional has the duty to assess the risk of infection based on objective and scientific information available to them in their respective professions. The dentist’s belief that a significant risk existed, even when maintained in good faith, did not relieve him from liability.

A number of ethical dilemmas have evolved around providing dental treatment to patients with or suspected of having HIV/AIDS. Researchers have found that up to 60% of patients with HIV/AIDS have oral manifestations of the infection (Robinson, Sheiham & Zakrzewska, 1996). Therefore, DHCP are often the first to discover the symptoms of HIV infection and to have to confront their findings with patients. It is the DHCP’s obligation to be truthful to patients to help them make choices about their future. In the case of HIV/AIDS, the health and safety of others is at stake. Many DHCPs are still
concerned about the possible risks which they might incur in treating patients with HIV/AIDS, and they sometimes argue that the moral balance has been shifted too much in the direction of patients’ rights. If a patient is HIV+, do DHCPs have the right to refuse treatment? According to Doyal (1997), this argument is unacceptable. DHCPs should be taught to show courage when facing minimal risk of infection when they are mandated by law to protect themselves with high levels of protection (Emanuel, 1988). There is no evidence that any DHCP has ever contracted the infection from treating a seropositive patient.

Transmissibility of HIV/AIDS

History of Infection Control Related to HIV/AIDS

During previous decades, most dentists practicing in North America were professionally prepared when it could be assumed that their concepts on infection control were based upon their undergraduate experiences. Only more recently as a consequence of AIDS, dentistry is being performed by masked, draped, and gloved DHCPs for whom direct patient contact is an anathema (Hardie, 1995).

The November 15, 1985 Morbidity and Mortality Weekly Report (MMWR 34) announced that specific recommendations were being formulated for health-care workers (e.g., surgeons, dentists) who perform invasive procedures and that separate recommendations were being developed to prevent HTLV-III/LAV (formerly used nomenclature for the HIV virus) transmission in prisons, other correctional facilities, and institutions housing individuals who may exhibit uncontrollable behavior (e.g., custodial
institutions) and in the perinatal setting. It stated that separate recommendations had already been developed for children in schools and day-care centers.

Six months later, in April 1986, *MMWR* (35) released the recommendations for health care workers that stated that dental personnel may be exposed to a wide variety of microorganisms in the blood and saliva of patients they treated. It also stated that infections could be transmitted in dental operatories by blood or saliva through direct contact, droplets, or aerosols, and although not documented, indirect contact transmission of infection by contaminated instruments was possible. The report also acknowledged that patients and DHCPs had the potential of transmitting infections to each other (CDC, 1986). Thus for the first time, the CDC outlined a set of infection-control strategies and recommendations for routine care of dental patients.

A follow-up *MMWR* (1987, 2S) emphasized the need for health-care workers to consider patients as potentially infected with HIV or other bloodborne pathogens and to adhere rigorously to infection control procedures for minimizing the risk of exposure to blood and body fluids of all patients. Thus, recommendations for universal precautions were included in this August 1987 report.

An update to the previous reports of 1986 and 1987 followed in 1988 (*MMWR*, 37), and stated that universal precautions were intended to prevent parenteral, mucous membrane, and non-intact skin exposures of health care workers to bloodborne pathogens. In addition, immunization with hepatitis B vaccine (HBV) was recommended as an important adjunct to universal precautions for health care workers who incurred exposures to blood.
In 1989, the CDC provided an overview of the modes of transmission of HIV in the workplace, an assessment of the risk of transmission under various assumptions, principles underlying the control of risk, and specific risk control recommendations for employers and workers (MMWR, S6). This document also included information for the medical management of persons in the workplace exposed to these viruses.

_Purported or Actual Cases of HIV Transmission from DHCPs to Patients_

These infection control recommendations had been in place for four years when in 1990, health authorities released a study about an undisclosed dentist in Miami who was thought to have infected 28 of his patients. This dentist practiced for 30 years in Liberty City, an area with heavy drug use and one of the highest rates of AIDS cases in Miami. Ultimately, there was no conclusive tie found between the dentist and the 28 patients (“No Tie Found,” 1995; Jaffe, McCurdy, Kalish, Liberti, Metellus, Bowman, Richards, Neasman & Witte, 1994). The report stated that although infection control procedures were flawed, the dentist did not transmit HIV to the patients. Researchers said that the DNA in the dentist’s HIV was different from the DNA found in his patients, and no sign that the patients contracted the virus from one another through the dentist’s tools existed.

Another 1990 incident of HIV transmission involved Dr. David Acer, a dentist with AIDS from West Palm Beach, Florida. According to the CDC and other health authorities, Dr. Acer had infected six of his patients. Based on DNA analysis, the CDC concluded that the strain of HIV that Acer carried was the same as the one found in his six patients (“No Tie Found,” 1995; Jaffé, et al, 1995; Neiburger, 1996). Therefore, the Florida Department of Health and Rehabilitative Services (HRS) and the CDC concluded that Dr. Acer’s practice was the only one of a health care worker with HIV infection in
which HIV transmission to patients had occurred. The available evidence suggested that HIV was transmitted from dentist to patient rather than from patient to patient.

Although the possibility of transmission of bloodborne infections from DHCPs to patients was considered to be small in 1993 (CDC, 1991 & 1992; Chamberland & Bell, 1992; Siew, Chang, Gruninger, Verrusio, & Neidle, 1992), precise risks had not been quantified in the dental setting through carefully designed epidemiologic studies. However, the Dr. David Acer incident prompted the CDC to publish new infection control guidelines for dental health care personnel (CDC, 1993; Ciesielski, Marianos, Ou, Dumbaugh, Witte, Berkelman, Gooch, Myers, Luo, & Schochetman, 1992). Whereas the precise event or events resulting in transmission of HIV infection in Dr. Acer’s dental setting had not been determined, epidemiologic and laboratory data indicated that these infections probably were transmitted from the DHCP to patients, rather than from one patient to another (Ciesielski et al, 1992). Presumed modes of HIV transmission identified by the CDC included sexual contact with Dr. Acer, from contaminated equipment, or from direct contact with Dr. Acer’s blood either accidentally or intentionally (Hardie, 1995). Patient-to-patient transmission of bloodborne pathogens to that point had only been reported in medical settings (Ciesielski et al. 1992).

Following release of the CDC report of the Dr. David Acer incident (MMWR, 1991:40), public concern about the transmission of HIV in the dental office increased. The case created media buzz and a public fear of dentistry (Neiburger, 1996). People surveyed expressed a decreased willingness to remain in the practice of dentists infected with AIDS, or those who treated infected patients (Cohen, Grace & Ward, 1992). The alarmist climate resulted in heavy pressure on the dental profession to show that dental
offices were safe places, and numerous laws, regulations and procedures were enacted to support this premise (Neiburger, 2004). In the midst of the alarm, Congress requested the General Accounting Office (GAO) to assess the methods and evidence used by the CDC in arriving at the above conclusion. Ultimately, the GAO found the CDC investigation to be thorough and competent (GAO, 1992).

Controversy and speculation was fueled by the inability to determine exactly how the transmission from Dr. Acer to his patients occurred. Articles in *Lear’s Magazine* and *The New York Times* plus a segment on the television news magazine “60 Minutes” presented findings of independent investigators (Barr, 1994; Barr, April 16, 1994) casting doubt on the conclusion that Dr. Acer had infected the six patients with the HIV virus. Barr (1996) responded in the *Annals of Internal Medicine* that as an investigative reporter, he had access to thousands of pages of documents related to the lawsuits brought by the patients against the dentist’s insurance company. These documents included medical records, legal depositions, scientific analyses, and the CDC’s epidemiologic field work and molecular analyses -- information not previously made public. Smith (1996) confirmed this information and concurred that the patients supposedly infected by Acer also reportedly engaged in behavior that put them at risk for HIV. Neiburger (1996) said of the CDC investigation: “In essence, the CDC compared apples with oranges using a warped ruler and a peach while flipping a bent coin—fuzzy science” (p. 26).

The following information explores the six patients supposedly infected by Dr. Acer. Although Patient A (Kimberly Bergalis) told federal and state investigators that she was a virgin, her vagina and anus tested positive for human papillomavirus (HPV)
type 18, a sexually transmitted infection; and a court ordered gynecological examination found the condition of the hymen to be consistent with having engaged in sexual intercourse. Harold Jaffe of the CDC confirmed that he had been given a copy of the gynecological report in 1990, months after the news about Patient A had broken worldwide. Jaffe gave the report to the CDC’s general counsel office which shielded it from access through a Freedom of Information Act. Shortly after the gynecological examination, Bergalis’ attorney met with her to make sure she was telling the truth (Smith, 1996). She left the office with a gift of $5,000 from her attorney, a blatant violation of Florida bar guidelines. He also gave Bergalis a car as a gift. The question remains as to whether the presents were given to make sure that she stuck to the story that she was a virgin, thus ensuring a large payout to her parents after her death.

The remaining five patients were already aware of the legal case by Patient A, and the CDC’s dentist transmission theory about their risk factors and sexual partners. Therefore, they had a monetary stake in remaining consistent with the CDC’s findings.

Patient I was the last patient to accuse the dentist. Barr (1996) stated that whereas the CDC’s investigators had access to insurance billing records of the family, they did not intensely scrutinize them. The patient’s records directly contradict her claims about the number of dental visits she made, and the kinds of dental treatment that she received. In fact, the records suggest that Patient I may never had been treated by Dr. Acer, meaning that she had no risk of exposure.

Patient G said that he had used intravenous drugs once in 1973, and had only two female sexual partners since 1986. In a sworn deposition, an acquaintance of Patient G stated that the patient had frequented a crack house three to four times a week in the mid-
1980s, that he traded crack for sex, and that he had unprotected intercourse as many as 50 times with a prostitute who later died of AIDS.

Whereas Patient C claimed that he had never had homosexual contact, in reality he had had anal intercourse at least six times with another man. In this instance, the CDC investigators reported for the first time that they had identified one male sexual partner who had tested negative for HIV, but overlooked this inconsistency in their epidemiologic analysis (Ciesielski et al. 1994).

When Patient B was first tested for HIV in 1990, she said that she had received blood during surgery between 1975 and 1985. Although she had several major surgeries during that time, her hospital charts show no record of any transfusion. In a deposition given in May, 1991, the patient disclosed an extramarital affair in the late 1970s, but failed to report this information to CDC investigators. When Barr (1996) contacted the sexual partner of Patient B in 1993, the partner said that he had never been tested for HIV, had not been contacted by the CDC, and had not had sexual relations with the patient. These issues indicate that the patient was not truthful about her sexual history when she was first asked by investigators.

Finally, evidence surrounding Patient E was the most puzzling. This patient was first diagnosed with HIV in 1988, and at that time, she believed that her boyfriend had infected her because he had known risk factors. Later, Patient E told investigators that her boyfriend had tested negative for HIV when she discovered her HIV+ status, and that he tested positive later. Barr (1996) found that her 1992 deposition testimony did not concur with the information presented by the CDC as to when she and her boyfriend learned of their infections.
Barr (1996) advanced many arguments that refuted CDC’s evidence and stance. One of these seemed especially important. In an unpublished letter to the CDC in 1990 before any information about the case became public, one of Ciesielski’s co-authors (Witte, Unpublished communication) called the analysis linking the dentist’s and the patient’s viral strains “scientifically inconclusive.” And although numerous calls to Witte’s office were made, none were returned.

Again, Barr (1996) told of Ciesielski and colleagues who sought to dismiss the epidemiologic and molecular questions that he raised by arguing that he presented evidence “related to private litigation generated by the case.” Barr stated that six of the eight scientists who participated in research critical of the CDC’s conclusions received no money from the insurance companies and had no financial stake in the outcome of their research. Several of the researchers claimed that their affiliation with the research had affected their chances of getting grants.

A Washington Post reporter presented a commentary on both viewpoints (Brown, 1996). Brown stated that in Barr’s and the scientist’s criticism of the CDC investigation, the argument was built that the investigation was fatally flawed and that the conclusions of the investigation were probably wrong. He said that they failed to present information that supported an alternative explanation. Related to the viral strains of the dentist and the patients, Brown (1996) wrote that it was unfortunate that neither the CDC investigators nor Barr had offered a chart quantifying the degree of similarity between the virus samples.

It is a case that still mystifies most everyone in the dental community. The strange case features disputable DNA sequencing tests, dubious legal strategies,
overwhelming media attention, and grieving families. Despite the mountains of documentation, there is still no known mode of transmission. Despite numerous theories, the origins of this series of cases remain unsolved. Until it is resolved, it may continue to spawn more questions than answers. Did Acer infect his patients through a contaminated handpiece? Did he intentionally commit cold-blooded murder? Did he infect them at all? We may never know the answers to these questions.

*Preventing Transmission of Bloodborne Pathogens: 2003*

These questions propelled the CDC to continue reviewing its infection control recommendations. According to the latest CDC report on infection control procedures (*MMWR*, 2003; p.37), the goal of a dental infection control program is to provide a safe working environment that will reduce the risk of health care-associated infections among patients and occupational exposures among DHCPs. A successful infection control program prevents or reduces the potential for disease transmission from patient to DHCP, from DHCP to patient, and from patient to patient. Components of infection control include a written exposure control plan, annual employee training, hepatitis B vaccinations and post-exposure follow-up.

As of December 2001, occupational exposure to HIV has resulted in 57 documented cases of HIV seroconversion among healthcare personnel (HCP) in the United States (*MMWR* report (52, RR-17; CDC, 2003). Personnel subject to occupational exposure should receive infection control training when they begin their job, when new tasks or procedures affect their occupational exposure, and at the least, on an annual basis. Training for DHCPs who may be exposed to infectious agents in the workplace
should include: (1) a description of their exposure risks; (2) a review of prevention strategies and infection control policies and procedures; (3) a discussion regarding how to manage work related illness and injuries, and (4) a review of work restrictions for an exposure or infection. Including DHCPs with minimal exposure risks (for example, administrative employees) in education and training programs may enhance facility wide understanding and importance of infection-control principles.

Previous CDC recommendations regarding infection control for dentistry focused primarily on the risk of transmitting bloodborne pathogens among DHCPs and patients and use of universal precautions to reduce risk. Universal precautions treated all blood and body fluids as potentially infectious agents, and involved preventive practices such as careful handling of sharp instruments, using rubber dams to minimize blood spattering, handwashing, and wearing protective barriers (gowns, masks, gloves and protective eyewear). In 1996, the term *standard precautions* was adopted and replaced universal precautions. Standard precautions integrated and expanded the concept of universal precautions into a standard of care designed to protect health care personnel and patients from infectious pathogens that can be spread by blood, other body fluid, excretion, or secretion. Because saliva always has been considered a potentially infectious substance, no operational difference exists in clinical dental practice between universal and standard precautions. For DHCPs who are infected with or exposed to HIV, the *MMWR* report (52, RR-17; CDC, 2003) suggests the following work restrictions: “Do not perform exposure-prone invasive procedures until counsel from an expert review panel has been sought; the panel should review and recommend procedures that personnel can perform, taking into account specific procedures as well as skill and technique. Standard
precautions should always be observed. Refer to state and local regulations or recommendations” (p.8).

Risk

*Webster’s Ninth New Collegiate Dictionary* (1988) defines “risk” as (1) the possibility of loss or injury; a dangerous element or factor, and (2) to expose to a hazard or danger (p. 1,018). The definition of “risky” means accompanied by or involving risk or danger. In this study, the term risk is associated with the risk of becoming infected with HIV/AIDS in a clinical dental setting.

From an epidemiological viewpoint, risk factors are those factors whose presence is associated with an increased probability that disease will develop later (Mausner & Kramer, 1985). Risk factors may be unchangeable, or susceptible to change. Even when there is a strong statistical association between a risk factor and a disease, not all persons with the risk factor will develop the disease. Moreover, the absence of the risk factor does ensure absence of the disease. Munjal (1994) states that risk factors for exposure exist within the patient, for transfer from patient to health care worker, and for transfer from health care worker to patient. In each of these pathways, the risk of transmission depends on the following conditions: (1) the number of HIV-infected individuals in the population; (2) the frequency of exposure to contaminated medical instruments; (3) the relative infectivity of the viral strain, and (4) the concentration of virus in the blood.

The two most important risk factors for contracting HIV for women living in Florida are using drugs and having sex with a partner who uses drugs (Knox & Sparks, 1998). Thus, the two major exposure routes for HIV for women living in Florida with
HIV/AIDS are injection drug use (9%, 13%); and heterosexual contact with an injection drug user (54%, 55%; Florida Department of Health, 2003). The two major exposure routes for men living in Florida with HIV/AIDS include men having sex with men (48%, 46%), and heterosexual contact (15%, 16%; Florida Department of Health, 2003).

**DHCPs’ Perceptions of Risk**

Dentists think of themselves as more continually at risk for AIDS than do other types of health care workers (Verrusio, Neidle, Nash, Silverman, Horowitz, & Wagner, 1989). Dentists’ perceptions of their occupational risk of HIV infection are important, because concerns about risk assessment of HIV infection may jeopardize the amount and quality of care provided to HIV+ patients (Kunzel & Sadowsky, 1993). Perceived professional and moral obligations to treat HIV+ patients were high in a study of dentists in Mexico City with 35% of dentists perceived the risk of contracting HIV infection as “considerable” to “very strong” (Maupome, Acosta-Gio, Borges-Yanez, & Diez-de-Bonilla, 2000). Additionally, only 54% of the respondents agreed that clinical precautions reduced occupational risks. Whereas this study was recent, it revealed contradictory attitudes toward HIV+ individuals and limited understanding of infection control recommendations. The same researchers (Maupome, Acosta-Gio, Borges-Yanez, & Diez-de-Bonilla, 2002) interviewed 180 dentists in 1999 using the same methods as in a 1992 survey. Overall, 79% of study participants still perceived the risk of contracting HIV infection as “considerable” to “very strong.”

A recent study by King & Muzzin (2005) of dental hygienists in thirteen states found that 54% of respondents felt that treating patients with HIV/AIDS increased their personal risk for contracting HIV. Sixty-four percent of respondents reported always
using *extra* precautions with HIV/AIDS, and hepatitis patients (60%). In addition to using extra precautions, 66% said they would not use an ultrasonic scaler when treating HIV/AIDS patients, or hepatitis patients (59%), which indicated an alteration in clinical practice. Again in this study, other findings were more surprising:

- 45% of dental hygienists reported that HIV was able to be transmitted via saliva,
- 41% of dental hygienists reported that HIV was able to be transmitted through splash/splatter, and
- 30% believed that HIV was able to be transmitted through dental aerosols.

To date, there has been no evidence of HIV or hepatitis C having been transmitted through aerosols or saliva in the dental setting (*MMWR*, 2003). This type of data is important, because the epidemic is 26 years old, and a high number of respondents still reported feeling a risk of occupational transmission of HIV.

*Other Health Care Providers Perception of Risk*

The literature on AIDS has asserted that fear and risk of contracting HIV is a significant concern among health care workers (Jemmott, Freleicher, & Jemmott, 1992; Jemmott, Jemmott & Cruz-Collins, 1992; Maupome, Acosta-Gio, Borges-Yanez, & Diez-de-Bonilla, 2000; Kunzel & Sadowsky, 1993). Jemmott, Freleicher, and Jemmott (1992) found that nurses who were increasingly exposed to high-risk groups for HIV/AIDS perceived that caring for them amplified their risk of HIV infection, even when universal precautions were used. Similarly, Jemmott, Jemmott and Cruz-Collins (1992) found that nursing students who had less AIDS knowledge and who perceived themselves to be at greater occupational risk of becoming infected with HIV expressed stronger intentions to
avoid caring for AIDS patients. Scherer, Haughey, and You-Wu (1989) revealed that half of the nurses surveyed were fearful of contracting HIV/AIDS, and another 20% were unsure of their risk. Half of respondents agreed that they would worry about putting their families, friends and colleagues at risk if they cared for individuals with AIDS, whereas 35% felt that caring for a patient with AIDS could affect their relationships with significant others.

The CDC estimates that the potential risk of transmitting HIV in the workplace is between 12 to 60 times less than the risk of transmitting hepatitis B (Hardie, 1995). The fact that dentists feel a greater level of comfort with patients with Hepatitis B than with HIV+ patients defies the science that has been validated (Neidle, 1994). Whereas there are limits to how accurately epidemiologists can calculate minimal risk, the research demonstrates that the risk of contracting HIV from a patient during a dental procedure is close to zero (Henderson & Beekman, 1994). Court decisions also have shown that the risk of transmission in the dental clinic or office is too low to justify discrimination against HIV+ patients (Burris, 1994). Furthermore, there was no evidence of HIV transmission in the occupational setting of 245 healthcare workers in Italy who participated in a 5-year surveillance program (Baldo, Floreani, Dal Vecchio, Cristofoletti, Carletti, Majori, Di Tommaso, & Trivello, 2002). After exposure of the healthcare workers and during the follow-up period, there were no seroconversions to any of the viral markers. Therefore, it was concluded that the accurate post-exposure follow-up revealed a lack of transmission of HBV, HCV, and HIV.
Public Perceptions of Risk

Although the risk of transmission in the dental clinic or office may be virtually non-existent, a study of almost 500 patients in Mexico City revealed that more than three fourths of the patients were concerned about the risk of contracting infections at the dental office and did not intend to continue treatment where patients with HIV/AIDS were receiving treatment, or where the dentist had HIV/AIDS (Irigoyen-Camacho, Zepeda-Zepeda, Maupome, & Lopez-Camara, 2003).

Early in the HIV epidemic, a cultural comparison of attitudes among hospital dental practitioners and dental students in their final year of study was conducted in Glasgow, Scotland, and Los Angeles, California (Samaranayake, Figueriredo, Rowland, & Aitchison, 1990). A significant proportion of respondents in both counties said that they would not visit their dentist if their provider treated AIDS patients, and significantly more Americans thought that AIDS could likely be transmitted in a dental clinic. A survey of public attitudes towards dentists who were HIV+ or who had AIDS was conducted on two occasions, three months apart in Dartford and Tunbridge Wells, Kent, England (Harwood, Newton, & Gibbons, 1995). During the three months, a TV show about this issue was shown. The results indicated that the public perception of risk of acquiring HIV infection through dental treatment was low.

Transmissibility of HIV/AIDS to Patients and to Dental Health Care Professionals

The Dr. Acer incident prompting adoption of stricter infection control procedures to prevent the spread of HIV via dental practice may have pacified a concerned public and the conscience of dental associations and licensing bodies (Hardie, 1995). However,
with all of the panic, fear and publicity surrounding the AIDS epidemic, one critical fact is often missed -- there never have been any documented cases of DHCPs getting occupational HIV (Neiburger, 2004).

Because HIV is spread primarily by bloodborne pathogens, it is essential to eliminate or isolate hazards to patients and DHCPs by using things like needle-retraction devices and puncture-resistant sharps containers. An MMWR report (CDC, 2003) states “Although transmission of bloodborne pathogens in dental health-care settings can have serious consequences, such transmission is rare. Exposure to infected blood can result in transmission from patient to DHCP, from DHCP to patient, and from one patient to another. The opportunity for transmission is greatest from patient to DHCP who frequently encounter patient blood and blood-contaminated saliva during dental procedures” (p.10).

Since 1992, there have been no reports of HIV transmission from DHCP to patients. The majority of DHCPs who are infected with a bloodborne virus (for example, hepatitis B, hepatitis C and HIV) do not pose a risk to patients because they do not perform activities that meet the necessary conditions for transmission. In fact, for DHCPs infected with a bloodborne virus such as HIV to pose a risk to patients, they must: (1) have the HIV virus circulating in the bloodstream; (2) be injured or have a condition such as weeping dermatitis that allows direct exposure to their blood or other infectious body fluids, and (3) allow their blood or infectious body fluid to gain direct access to a patient’s wound, traumatized tissue, mucous membranes, or similar port of entry. Therefore, transmission cannot occur unless all three conditions exist.
The risk of occupational exposure to bloodborne viruses is mainly determined by their prevalence in the patient population and the nature and frequency of contact with blood and body fluids through percutaneous or permucosal routes of exposure (breaks in the skin or mucosa). The actual risk of becoming infected after an occupational exposure to a bloodborne pathogen is influenced by three factors: (1) the size of the inoculum; (2) the route of exposure, and (3) the susceptibility of the person exposed. Bloodborne pathogens present different levels of risk to DHCPs. Nationally, the risk of HIV transmission in dental settings is extremely low. In fact, just 57 cases of HIV have been documented among health-care personnel since 1981, but none have been documented among DHCPs. Prospective studies worldwide have shown that the average risk of HIV infection after a single percutaneous exposure to HIV-infected blood is 0.3% (range 0.2%-0.5%), and a mucous membrane exposure is approximately 0.1% (MMWR, 2003).

After an occupational exposure to blood has occurred, post-exposure management is an integral component of preventing infection, and first aid should be administered as necessary. Therefore, puncture wounds and other injuries to the skin should be washed with soap and water, and mucous membranes should be flushed with water. DHCPs who have been exposed should report the exposure to the infection control coordinator or other designated person at the worksite, who should then refer the exposed staff member to a qualified health care professional who will complete the necessary reports. The 2001 guidelines (MMWR, 2001) provide guidance to clinicians and exposed DHCPs regarding when to consider HIV post-exposure prophylaxis and that enhance the dental hygienist’s ability to practice. Hygienists are not required to complete continuing education requirements during the biennium in which they receive initial licensure.
HIV/AIDS Continuing Education for Dental Personnel

Effective May 11, 2005, dentists and dental hygienists are no longer required to complete instruction in laws, rules and ethics governing the practice of dentistry and dental hygiene to renew their license (Florida Department of Health, 2004). The 2006 legislation amended the requirements for HIV/AIDS where a dentist or dental hygienist must complete a course in HIV/AIDS prior to their first license renewal, and a Domestic Violence course is now required every third renewal period.

Dentist - 30 hours that must include:

- 2 hours in the prevention of medical errors
- 2 hours in domestic violence (every third biennium)
- In addition to the 30 hours, each dentist must complete a CPR course at the basic life support level, which includes training in cardiopulmonary resuscitation (CPR) at the basic support level, including one-rescuer and two-rescuer CPR for adults, children, and infants; the relief of foreign body airway obstructions for adults, children, and infants; the use of an automatic external defibrillator (AED); and the use of ambu-bags resulting in certification or recertification by the American Heart Association, the American Red Cross or an entity with equivalent requirements.

Dental Hygienist - 24 hours that must include:

- 2 hours in the prevention of medical errors
- 2 hours in domestic violence (every third biennium)
- In addition to the 24 hours, each dental hygienist must complete a CPR course at the basic life support level, which includes training in cardiopulmonary resuscitation (CPR) at the basic support level, including one-rescuer and two-
rescuer CPR for adults, children, and infants; the relief of foreign body airway obstructions for adults, children, and infants; the use of an automatic external defibrillator (AED); and the use of ambu-bags resulting in certification or recertification by the American Heart Association, the American Red Cross or an entity with equivalent requirements.

- All credit hours must be earned within the biennium for which they are claimed.

*International Picture: Treatment of HIV/AIDS Patients*

The literature is rich with articles about medical and dental providers who are wrestling with the issue of treating versus not treating HIV/AIDS patients. Looking at the international picture of dentistry and HIV/AIDS is important, as the pandemic continues to spread worldwide. Fears regarding the occupational transmission of HIV infection have prompted changes in dentistry’s approach to infection control. However, fear, ignorance and uncertainty have produced irrational behavior of HIV-negative dental staffs toward patients with HIV infection (Fukuda, H., 1993).

The willingness of dentists to treat HIV+ persons is the issue. A study of doctors and dentists in Singapore discovered that 74% expressed fear of contracting AIDS from patients, and 85% agreed that their staff members would be very upset at treating them (Lee, Yong, & Tan, 1989). A later study conducted on medical and dental practitioners in Singapore demonstrated that although a large majority felt they had the ethical obligation to treat HIV+ patients, only half of them said they would be willing to do so if they were given the choice (Chan, Khoo, Goh, & Lam, 1997). These more recent data were an improvement over 1989 findings. A study of Italian dentists (Angelillo, Villari,
D’Errico, Grasso, Ricciardi, & Pavia, 1994) revealed that 72% of dentists would treat HIV+ patients, and 67% would treat patients with AIDS. Dentists were more willing to care for an HIV+ patient if they were involved in specialties with high blood contact, if they had previous contact with HIV+ patients, and if they did not consider saliva a possible route of transmission of HIV. Alternately, 12% of dentists refused to treat patients at risk for AIDS, or those who were HIV+ (9.4%). In this study, willingness to treat was the most significant predictor of treating an HIV-infected patient.

A study of Dutch dental hygienists showed that fear of infection appeared to be negatively correlated to experience in treating HIV-infected patients (ter Horst, 1993). An earlier study of Amsterdam dentists by ter Horst, et al, (1989) found that 30% of respondents were definitely fearful of AIDS and wanted additional information or training on this topic.

A study of the willingness of general practice dentists in Brazil indicated that only 44% were willing to provide treatment to HIV+ patients (Spoto, Goncalves, Ferracioli, Porter, Afonso, el-Maaytah, Di Alberti, & Scully, 1994). Other Brazilian researchers reported that there was still prejudice and ignorance about the risk of HIV/AIDS among both dental surgeons and patients (Discacciati & Vilaca, 2001). Fifty-two percent of dentists surveyed in England and Wales said they treated patients at high-risk for AIDS and hepatitis B (Wilson, Burke, & Cheung, 1995). Associations were found between willingness to treat high-risk category patients and number of years since graduation, gender, number of postgraduate courses attended, and practice type. In the Republic of Ireland, a study of dentists demonstrated a fear of HIV to themselves, other patients, and their practice which indicated that attitudes related to dangerousness remained a
significant obstacle in the treatment of patients with HIV infection (Gibson, Freeman, & McCartan, 1997). Seventy-four percent of dentists surveyed in Mexico City reported that they would be willing to treat HIV/AIDS patients, whereas the remaining 26% were not willing to treat them (Irigoyen, Zepeda, & Lopez-Camara, 1998). The opposite findings among dental health care workers in Japan revealed that the majority of respondents were hesitant to treat HIV+ patients, and only 22.4% had the same attitude towards treating HIV+ and HIV-negative patients (Kitaura, Adahi, Kobayashi, & Yamada, 1997).

The incongruence between perceived knowledge, reported practice and attitudes of dentists in Nairobi, Kenya, suggested a need for continuing education courses to enable them to practice with due care in treating HIV/AIDS patients (Gachigo, & Naidoo, 2001). The results of this study also indicated that a greater compliance with universally accepted guidelines for infection control is needed. The same results were found in a South African study (Darling, Arendorf, & Samaranayake, 1992). Only 45% of dentists were prepared to provide continuing care to HIV+ patients, and therefore, further educational efforts on HIV infection and its implications in dentistry were suggested for these providers. A study of infection control among dental hygienists in Italy also supported these findings (Angelillo, Nardi, Rizzo, & Viggiani, 2001) as only 37% of respondents knew all five oral manifestations of AIDS. This study suggested that educational programs are needed to improve knowledge about the oral manifestations of AIDS to support dentists in providing early diagnosis, and about the correct use of universal precautions for preventing infections in the dental setting. Finally, a study in Southeast China of 454 physicians and physician assistants revealed that only 40% of
respondents were willing to provide care for HIV-infected individuals (Cai, Moji, Honda, Wu, & Zhang, 2007).

What justifies me doing this now?

DHCPs in other states have contributed to the literature by conducting studies of dental hygienists and dental hygiene students and their attitudes, intentions and behavior towards treating HIV/AIDS patients. The most recent study surveyed dental hygienists in thirteen states (Florida was not included) to investigate the infection control practices of practicing dental hygienists, and to document the attitudes and practices of dental hygienists toward patients with infectious diseases (King & Muzzin, 2005). This study found that 54% of respondents felt that treating patients with HIV/AIDS increased their personal risk for contracting the disease, and almost 64% reported that they always used extra precautions with HIV/AIDS patients. An alteration in clinical practice habits was reported by 66% of respondents who said that they would not use an ultrasonic scaler when treating HIV/AIDS patients. Another recent study was conducted in Maryland and found that dental hygiene students displayed no bias toward homosexuals, and showed minimal bias toward individuals with AIDS (Cohen, Romberg, Dixon, & Grace, 2005). A previous study of Pennsylvania dental hygienists indicated that 85% of respondents possessed a moderate or high level of worry concerning their treatment of AIDS patients (Snyder, 1993). An Illinois study revealed that 45% of dental hygienists believed that healthcare workers should not refuse care to people with AIDS. However, more than 50% said that they would quit their jobs before working with someone who had AIDS (McCormack-Brown, 1991). Dental hygienists in Mississippi were asked about treating
patients with infectious diseases (Daniel, Silberman, Bryant, & Meydrech, 1996).

Whereas most hygienists (98%) believed that barrier techniques were effective in stopping disease transmission, some believed that patients infected with HIV/AIDS (43%), hepatitis B (31%), or tuberculosis (40%) posed a threat to DHCPs, and were best treated in public clinics rather than private practice settings. The results of a study by Haring and Lind (1992) indicated that the dental hygiene students in Ohio demonstrated a significant negative bias toward persons with AIDS. Literature searches have not provided the same type of studies of Florida dental hygienists.

**Attitudes**

Gerbert, Badner and Maguire (1988) assessed DHCPs’ attitudes toward people at risk for HIV, and those with AIDS in terms of willingness to treat them. Dentists who were over 43 years of age held attitudes that represented greater barriers to providing care for persons at risk for, and those with AIDS. Data also showed that DHCPs’ attitudes were more favorable if they perceived a greater percent of patients in their practice to be at risk of getting AIDS.

Whereas some stigmatizing attitudes and discriminatory practices are obvious, others remain hidden, and there is no clear relationship between attitudes and behavior in this circumstance (UNAIDS, 2004). Some studies have found that people who express negative attitudes toward HIV-infected individuals, may provide supportive care for an HIV+ member of their own family. Alternately, some people who deny any negative attitudes towards people who are HIV+ may actively discriminate against them in certain settings, such as providing health care. Some interventions that are designed to reduce
discriminatory attitudes may have a more rapid and profound effect on reported attitudes than on embedded attitudes that influence a person’s behavior. Researchers have found it difficult to collect information about behavior towards those who are HIV+ (Sadowsky & Kunzel, 1994). However, for lack of better measures, questions about people’s attitudes are likely to remain vital in attempting to track changes in negative attitudes towards people with HIV.

People who have been diagnosed with HIV/AIDS feel the stigma associated with it (Green, 1995). The high level of stigma associated with HIV is a feature of the disease, and agencies that support people with the virus are concerned about the severe social consequences that accompany this particular diagnosis. This stigmatization extends to HIV+ persons who wish to access dental care. Green (1995) found that people with HIV clearly felt “marked out” and professed to hold more liberal attitudes about people with HIV than the general population. Therefore, it is possible that while claiming to hold non-stigmatizing attitudes, many people in the general public may act in stigmatizing ways.

Some health care workers attribute negative characteristics to people with AIDS (Katz, Hass, Parisi, Astone, McEvaddy, & Lucido, 1987). Many health care workers have an undue fear of AIDS patients (Blumenfield, Smith, Melazzo, Seropaian & Wormser, 1987). These studies also revealed that more social rejection was expressed toward AIDS patients. Katz, et al. (1987) concluded that the extreme negative attitude toward AIDS patients resulted from their perception that these patients were responsible for their own illness. Regardless of why some health professionals feel discomfort when caring for HIV+ patients, it is important to realize that their ethical attitudes are at the
core of being able to treat them successfully. Whereas continuing education in HIV/AIDS is now mandatory for health care professionals and technicians, many still appear to express unreasonable beliefs and attitudes about AIDS that are not apparent for other contagious diseases.

Whereas DHCPs are considered to be “low” risk of contracting HIV/AIDS, they have ten times greater risk of contracting hepatitis B and becoming chronic carriers (Seacat & Inglehart, 2003). Grace and Cohen (1993) surveyed Maryland dentists about their attitudes toward treating AIDS and hepatitis patients. Based on self reports, oral surgeons (58.3%) were the most willing to treat AIDS patients than were general dentists (43.1%) or periodontists (31.1%). Oral surgeons also were more likely to have treated AIDS patients than were general dentists or periodontists. These findings suggest that direct contact with AIDS patients may promote willingness to treat them. Respondents were asked whether they agreed with the American Dental Association (ADA) position that all dentists had a professional responsibility to treat AIDS patients. Findings showed that only 23.9% of periodontists, 33.3% of general dentists and 42.9% of oral surgeons agreed with the ADA position.

Despite their training and education, many health professionals share many of the same attitudes toward AIDS and HIV+ patients as the lay community. Some health care professionals experience anxiety and uncertainty when treating those with HIV/AIDS, due to stigmatizing beliefs and prejudices. Some studies have demonstrated bias by health care professionals against AIDS patients (Sears, & Ho, 2006; Kinsler, et al, 2007), whereas other studies have identified the lack of basic knowledge about AIDS (Cai, et al, 2007). The University of California at Los Angeles (UCLA) study (2006) found that 56
percent of skilled nursing facilities, 47 percent of obstetricians, and 26 percent of plastic and cosmetic surgeons would not accept HIV+ patients for services that were commonly provided to HIV-negative patients. The large number of health care providers who admitted that they would not treat HIV+ patients indicates a broad lack of knowledge about the laws prohibiting such discrimination. This report is consistent with studies from the mid-1990s showing high levels of HIV-discrimination by dentists and other health care providers. Since then, very few studies had been conducted to measure HIV-discrimination in health care. For example, one study found that both medical students and practicing physicians held harsh and judgmental attitudes toward persons with AIDS as compared to persons with leukemia (Kelly, St. Lawrence, Smith, Hood & Cook, 1987a, 1987b). Another article published by Kelly, et al, 1988) reported that many nurses had negative attitudes toward patients with HIV/AIDS that resulted in an unwillingness to interact with them, even casually.

AIDS has had an effect of further stigmatizing homosexuals. This relationship may be due to the view that they put themselves at risk of contracting HIV infection through high-risk sexual behavior (Katz, et al., 1987). Their research, although conducted in the 1980s, supported the fact that stigmatization associated with AIDS brings out the disdain in health care professionals as well as in the general public. Alternately, second year medical students at a large Midwestern university were significantly more tolerant toward AIDS patients if they had homosexual and/or HIV+ friends (Kopacz, Grossman, & Klamen, 1999).
Intentions

Concern exists about dentists’ reluctance to treat HIV+ patients. Efforts have been made to document the extent of their reluctance, and to contemplate the factors that influence it. Some factors have been documented that contribute to the variations in dentists’ reported willingness to treat patients with HIV/AIDS. These factors include but are not limited to: homophobia, stage of disease, and treatment location.

Homophobia is seen in a California study of dentists that found that 70% agreed that dental personnel had a responsibility to treat AIDS patients, although 63% of them reported that they would not want to treat homosexual males, intravenous drug users or hemophiliacs (Gerbert, 1987). Breault and Prolifroni (1992) also reported discomfort and reluctance about coming in contact with HIV+ patients due to harboring a negative attitude towards homosexuality and intravenous drug users, and fear of contracting the virus. One study of Chicago dentists found that 68% would be willing to treat asymptomatic HIV+ patients (Moretti, Ayer & Derefinko, 1989), but another Chicago study one year later indicated that 73% of dentists would not knowingly treat HIV+ persons (Rydman, Yale, Mullner, Whitels & Banx, 1990). That same study showed that fewer respondents would treat symptomatic patients of record with AIDS (19%), than asymptomatic AIDS patients of record (24%), and fewer dentists would treat new patients than patients of record. These dentists also believed that a special clinic outside of their private practices should be established for patients with AIDS, and some respondents saw the need to establish a specialty clinic within their own practice for HIV+ patients. Another national study found that 60% of dentists were willing to treat HIV+ patients, but only 29% agreed that private practice was an acceptable location to
treat them (Sadowsky & Kunzel, 1991). These perspectives toward practice were strong
predictors of dentists’ willingness to treat patients with HIV/AIDS. A survey of Asian-
American and non-Hispanic/Caucasian-American dentists who practiced in New York
City revealed that Asian dentists expressed significantly more negative attitudes, and
more unwillingness to treat HIV+ patients than did White dentists (Raphael, Kunzel &
Sadowsky, 1996). It also showed that Asian dentists schooled outside of the U.S. held
more negative attitudes than those who had been schooled within the U.S. Acculturation
may have an impact on access to oral health care among HIV+ persons as Asian-
American dentists become increasingly represented among practicing dentists in the U.S.

Researchers found an increased willingness by dentists in private practice to treat
HIV+ patients (Sadowsky & Kunzel, 1994). Two national surveys conducted in 1986
and 1988 reported an increase from 21% to 31% respectively (Verrusio, Neidle, Nash,
Silverman, Horowitz, & Wagner, 1989). Similarly, surveys of Minnesota dentists
showed that 23% were willing to treat AIDS patients in 1986, and that increased to 38%
one year later (DiAngeles, Martens, Little, & Hastreiter, 1989).

A study was conducted to understand the intention of dentists in Quebec province
to provide clinical care to HIV/AIDS patients (Godin, Naccache, Brodeur, & Alary,
1999). Overall, dentists had a strong intention to provide clinical care to these patients.
However, 25% of the respondents indicated a low intention to provide dental care to
them. The main factors explaining the variance in intention were perceived behavioral
control, personal normative belief, and habit of treating patients with HIV/AIDS.
McCarthy, Koval, MacDonald and John (1999) found that the best predictors of
willingness to treat patients with HIV were younger age (less than 30 years), attending
continuing education on HIV/AIDS in the past two years, practicing in small population centers (under 10,000), and gender (male). Another study of private general practice dentists in New York City looking at predictors of willingness to treat HIV-infected patients revealed that the influence of practice viability was a statistically significant predictor for men, whereas informal and formal collegial norms were more influential predictors for solo female practitioners (Kunzel, Sadowsky & Tseng, 1997).

Quartey (1998) found a strong positive correlation between having ever treated an HIV+ patient, and willingness to treat HIV/AIDS patients. McCarthy, Koval and MacDonald (1999) found that the best predictors of refusal to treat patients with HIV/AIDS were lack of ethical responsibility, fear of cross infection and lack of knowledge of HIV. Another study by these researchers identified the best predictors of dentists refusal to treat patients with HIV were older age (over 60 years), and practicing in population-dense centers (> 500,000) areas (McCarthy, Koval MacDonald & John, 1999). Other researchers (Jemmott, Jemmott III & Cruz-Collins, 1992) found that nursing students who had less knowledge of AIDS and who perceived greater occupational risk of HIV infection expressed stronger intentions to avoid caring for AIDS patients.

Unwillingness / Refusal to Treat

There are many reasons why dentists are afraid of, or disdain people with HIV-infection (Glick & Burris, 1997). They may fear occupational transmission or social contamination, loss of business, or they may not agree with the lifestyles of some HIV+ persons. Burris (1996) investigated the causes of this discrimination, and found that
knowledge alone did not change dentists’ unwillingness to treat. Their results also emphasized the influence on dentists’ behavior of professional norms. McCarthy et al (1999) found that the strongest predictor of refusal to treat patients with HIV/AIDS was lack of ethical responsibility.

Gerbert, Badner and Maguire (1988) found that 45% of dentists surveyed felt that fully complying with infection control procedures was a financial burden, and therefore, 70% of them preferred to refer both persons at risk for, and those with AIDS to other DHCPs for care, even though 65% believed that they had a responsibility to treat such patients. It is important to note that this study was conducted before infection control procedures were mandated legislatively.

Grace and Cohen (1993) showed that there were no differences among oral surgeons, general dentists and periodontists when asked if they were unwilling to treat AIDS patients. All groups listed the same reasons for not treating AIDS patients: increased personal risk of infection, followed by staff fears of infection, and finally, fear of losing patients.

The “If I treat HIV-infected patients, my non-infected patients will leave” argument is similar to concerns heard from restaurant owners in the era of racial desegregation in America. It is a classic example of a collective action problem, and someone has to be first. If all dentists committed to treating HIV+ patients, no one dentist would suffer (Grace & Cohen, 1993).

A survey of critical care nurses showed that if given a choice, 45% of those working in a teaching hospital, and 65% of those working in a community hospital would refuse to care for patients with AIDS (Damrosch, Abbey, Warner, & Guy, 1990). Those
nurses who indicated a preference for refusal showed significantly higher levels of concern and significantly less favorable attitudes than the remainder of respondents. Similarly, a study of second year medical students at a large Midwestern university revealed that one-third believed they had the right to refuse to treat AIDS patients (Kopacz, Gossman, & Klamen, 1999).

McCarthy, Koval and MacDonald (1999) found that the best predictors of refusal to treat patients with HIV/AIDS were lack of ethical responsibility, fear of cross infection and lack of knowledge of HIV. Another study by these researchers identified the best predictors of refusal treat patients with HIV were older age (over 60 years), and practicing in population centers with more than 500,000 population (McCarthy, Koval MacDonald & John, 1999). Other researchers (Jemmott, Jemmott III & Cruz-Collins, 1992) found that nursing students who had less knowledge of AIDS and who perceived greater occupational risk of HIV infection expressed stronger intentions to avoid caring for AIDS patients. Researchers found that late responders to their survey were significantly more likely to report that they would refuse to treat any patients with HIV (McCarthy & MacDonald, 1997). A recent study provided insight into why health care providers refused to treat HIV+ patients (Sears & Ho, 2006): 1) some justified their policies by their lack of expertise or medical equipment; 2) they had not treated an HIV+ patient before, or 3) their staff were inadequately trained, or would “revolt” if asked to treat an HIV+ patient.
**Behavior**

The experience of treating HIV-infected patients had a greater impact than knowledge alone in influencing dentists’ behavior towards HIV/AIDS patients (Quartey, 1998). Results of a study of Texas dentists revealed an inverse relationship between population density and avoidance behavior towards AIDS, and dentists who had practiced more than ten years displayed higher avoidance characteristics toward AIDS (Cottone & Dove, 1990). There is little literature about actual behavior of dental providers (Glick & Burris, 1997).

**Dental Care Experiences of HIV+ Individuals**

One study assessed the experiences of people living with HIV/AIDS in obtaining and undergoing dental treatment (Terry, Jones, & Brown, 1994). Seventy-five percent of respondents believed that dental care was important, or very important, and 37% had increased the frequency of their dental visits. Seventy-four percent of the participants had disclosed their HIV diagnosis to their dental provider. Of those who had concealed their HIV status, one-third feared rejection by DHCPs. Only three subjects reported denial of treatment on the grounds that they were HIV+. Interestingly, almost half of the participants changed dentists after they were diagnosed as HIV+. The main reasons for these changes included cost of care, and fear of breach of confidentiality.

Another study assessed the experiences of people living with HIV/AIDS (n=57) in Aotearoa, New Zealand in obtaining and undergoing dental treatment (Terry, Jones, & Brown, 1994). The majority of respondents were gay white males. Seventy-four percent of participants had disclosed their diagnosis to their DHCP and had experienced either
supportive or sympathetic reactions. Of those who had not disclosed, only three people reported denial of treatment on the grounds of their HIV status, and another two people were referred by their practitioner after disclosure.

A professional colleague discussed his experiences with being diagnosed and a subsequent dental visit. Both experiences revealed stigma and discrimination by health care providers. “Jim” was working as a truck mechanic in 1993 when he hurt his back while lifting an engine. The back problems were painful, and he had three bulging discs. Simultaneously “Jim” began to experience high fevers, weight loss, and thrush in his mouth. Primary care doctors were unable to relate the symptoms to the back problems, and they referred him to specialists. Finally, after loosing more than 30 pounds and thinking he was going to die, he was referred to an oncologist, who ran all the necessary tests for cancer. Once again, the diagnosis was negative. So the doctor tested him for HIV, and “Jim” returned for the results. The oncologist walked into the office and said to him: “So, why are you so bad? I go to medical school, raise my children, and live a good life. YOU have AIDS!” Because of the thrush, the oncologist recommended that he see a dentist. He made the appointment with a dentist who was listed as a provider on his wife’s new dental plan. “Jim” went to the appointment and checked “yes” next to HIV/AIDS on the health history. When he told the dentist he was HIV+, there was a noticeable change in the dentist’s attitude. In fact, no one asked him questions, but many staff members came into the operatory to “look” at him. He said he felt like he was a spectacle. The dental hygienist cleaned his teeth, and did not use universal precautions, even though “Jim” told her to use them. Upon walking out of the operatory, “Jim” saw HIV+ written in four-inch red letters on the front of his chart. Next “Jim” went to a case
management agency where a case manager was assigned to help him negotiate the health care system. He discussed the dental visit with the case manager who agreed with his assessment. “Jim” called the dental office, and complained to the dentist about the disrespectful behavior during his office visit. The dentist called him back to inform him that he would be re-evaluating the office policies. “Jim” did not return to that dental office (personal communication, April, 2006).

Theoretical Framework

A theory is a set of interrelated propositions containing concepts that describe, explain, predict, or control behavior (Glanz et al. 1990). Theories (conceptual frameworks) are useful because they enhance, inform, and complement the practical technologies of health education.

Value expectancy theory provides a framework for methodologically evaluating the issues a person may consider in deciding whether or not to take a specific course of action. Value expectancy theories such as the Health Belief Model (HBM) and the Theory of Reasoned Action, also considered to be a grounded theory, have evolved over the past 30+ years during which time considerable progress was made in understanding what determines individuals’ health-related behaviors and methods of stimulating their positive behavior changes.

The theoretical framework for this study is the Theory of Reasoned Action (TRA) (Fishbein, 1967; Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). The TRA focuses on individual motivation to determine the role of someone engaging in a specific behavior (Fishbein & Middlestadt, 1989). Ajzen and Fishbein’s Theory of Reasoned Action is a
highly developed behavioral theory (Glanz et al. 1990). The TRA proposes that
behavioral intentions and associated behaviors result from a rational process. The focus
of this theory is on the attitudes, beliefs, and intentions regarding the proposed behavior.
This model assumes that behavioral intention is the immediate precursor that determines
behavior, and all other factors that influence behavior are mediated through that intention.
The measurements of intention and behavior must closely correspond with each other in
terms of the action, target, context and time to predict behavior accurately. The Theory
of Reasoned Action has been used more recently by AIDS researchers to develop
interventions that help people at high risk to lower their risk of contracting HIV infection
(Morrison, Baker & Gillmore, 1998; Norris & Ford, 1995). For example in this proposed
study, if the action of interest is treating patients with HIV/AIDS, intention to treat that
specific population should be assessed among dental hygienists. The target population is
patients with HIV/AIDS; context applies to the place where the action takes place (clinic,
private office, hospital), and time (day, afternoon, evening, weekend or holiday) is the
timing of the action. A graphic summary of the Theory of Reasoned Action is shown in
Figure 2.2.
The Health Belief Model lends itself to the Theory of Reasoned Action. Four central beliefs are thought to influence behavior in the Health Belief Model: (1) an individual’s perception of their personal susceptibility to a disease; (2) the actual severity of the disease or person’s condition; (3) the perceived effectiveness of the behavior in dealing with the condition, and (4) one’s perceived barriers to adopting the behavior. These four beliefs, combined with the affective domain of attitude, are incorporated into the Theory of Reasoned Action (Coreil, Bryant & Henderson, 2001).

In 1988, Rosenstock, et al, proposed that self-efficacy be added as a separate independent variable to the HBM constructs of perceived to more fully account for health-related behavior. Efficacy expectation is defined as the confidence that one can successfully perform the behavior required to produce the outcomes, and is distinct from outcome expectation which is defined as one’s estimate that a given behavior will lead to certain outcomes. Therefore, it is important to show this distinction since both are required for behavior. The original HBM was limited to simple preventive actions such
as getting an immunization, however, the situation is different when working with chronic illness, particularly when long-term change is required. This requires a great deal of confidence that a person can alter their lifestyle before successful intervention is possible. The following diagram shows this relationship:

![Diagram](PERSON BEHAVIOR OUTCOME)

Efficacy Expectations

Outcome Expectations

For example, for a dental hygienist (PERSON) to treat HIV/AIDS patients (BEHAVIOR) and not become infected with HIV (OUTCOME), he/she must believe both that treating HIV/AIDS patients will not harm his/her health (OUTCOME EXPECTATION) and also that he/she is capable of treating HIV/AIDS patients (EFFICACY EXPECTATION). And this takes us directly to the Theory of Reasoned Action.

According to the Theory of Reasoned Action, attitudes are a function of beliefs, and the beliefs that underlie a person’s attitude toward the behavior are termed behavioral beliefs. An individual’s positive or negative evaluation of performing the behavior is termed attitude toward the behavior (Azjen & Fishbein, 1980; Dunkle & Hyde, 1995). Attitude is defined as the tendency to react positively or negatively to a person, object or situation (Coreil, Bryant & Henderson, 2001). One’s attitudes have a great influence over their behavior. When it comes to health behaviors, attitudes are strongly related to consequences. How someone feels about adopting a health behavior is linked to one’s perception of the outcome. For example, if one perceives the outcome to be positive, then performing the health behavior will create positive attitudes. On the
other hand, the more barriers one expects, the more likely that person will develop	negative attitudes, and not adopt the behavior.

The beliefs underlying a person’s subjective norm are called normative beliefs.
Normative beliefs are the person’s beliefs that specific individuals or groups think he/she
should or should not perform the behavior. Thus, the subjective norm may exert pressure
to perform or to not perform a given behavior, independent of the person’s own attitude
toward the behavior. Figure 2.3 summarizes the discussion and operationalizes the
variables around the theoretical constructs.

Figure 2.3. Factors Determining One’s Behavior and Survey Item Categories

The relationship between intentions and health behavior has shown varied results. Researchers (Rise, Astrom & Sutton, 1998) studied adolescents’ use of dental floss and found that subjects in the intenders group were more likely to floss their teeth, because they believed it would result in positive outcomes. Chan and Heaney (1997) found that workers who intended to participate in a worksite smoking cessation program were more likely to attend the education sessions than those workers who had not stated their intentions to participate. At the same time, stress levels of these workers mediated this relationship. For example, workers who believed their jobs to be highly stressful were
more likely to think that they needed to participate in the smoking cessation program. Alternately, Wambach (1997) studied pregnant women’s intentions to breastfeed, and found that the women’s pre-delivery intentions were not correlated to their postpartum behavior, especially in first time mothers. Another study (Baker, 1988) showed that the two predictor variables (attitude toward the behavior, and perceived norm of other important persons) significantly predicted participants’ intentions to use condoms with steady, and with new or infrequent partners.

The Theory of Planned Behavior (TPB; Figure 2.4) was developed by Ajzen (1985) in an attempt to expand the applicability of the TRA to situations where behavior is not under a person’s willful control (Chatzisarantis, & Biddle, 1998). Intentions and behavioral control are mediated by motivation and ability. Millstein (1996) stated in her study that whereas prior behavior was the best single predictor of subsequent behavior, small significant associations were detected for the full set of TPB constructs. Significant relationships were identified between behavior and perceived behavioral control and behavioral intentions. This study supports the relevance of the TRA/TPB models for studying the behavior of health care providers.

Whereas the TPB is an extension of the TRA, actual behavior of dental hygienists is not being tested in this study, because of Florida Rules and Regulations governing their direct, indirect and general supervision by dentists. In other words, dental hygienists in Florida do not have autonomy to treat a patient until they are first seen and examined by the dentist who then decides whether or not to treat them.

The social normative and attitudinal constructs are important factors to examine when attempting to predict the behavioral intentions of health care providers (Baker,
In two other studies, nurses decisions to provide care for HIV-infected patients were affected by the negative influences of spouses, family members, intimate friends, and religious beliefs (Kerr & Horrocks, 1990; Scherer, Haughey & You-Wu, 1989). Jemmott, Freleicher, and Jemmott (1992) reported that nurses who were increasingly exposed to persons in AIDS risk groups perceived that caring for them increased their risk of contracting HIV infection, despite using universal precautions. Nurses who were surveyed regarding their lack of compliance with universal precautions offered a variety of reasons: inadequate AIDS education and supplies, previous habits, frequent change in CDC and agency directives, and their belief that transmissibility of HIV was greater than the CDC was willing to admit (Siminoff, Erlen & Lidz, 1988).

Summary

On June 5, 1981, the Centers for Disease Control and Prevention (CDC) issued the first warning about a rare form of pneumonia among gay men that was later found to be related to AIDS. The epidemic has now become a pandemic of previously unknown proportions, and has taken its toll on our nation, and more specifically Florida. Florida ranks third in the nation for adult and adolescent cases of AIDS, and second in the nation for confidential name-based reporting of newly diagnosed HIV infection. Racial and ethnic disparities, poverty and disabilities are apparent among HIV/AIDS populations.

There has been a relative dearth of attention paid by health care planners and policy makers to dental health issues, despite the important relationships established among oral health, nutrition and general health. Oral health care conditions associated with HIV disease are frequently more severe than those of the general population, making
access to both dental and medical care imperative. Two HIV Costs and Services Utilization Studies (HCSUS) of unmet need for oral health treatment in HIV+ patients revealed a dramatic increase in unmet need for dental services from 2001-2005. The significance of these studies is evident when one considers the scarcity of dental health care professionals that have been willing to treat persons with HIV/AIDS over the last 25 years. Better data of this kind may improve understanding and estimating problems of clinically treating persons with HIV/AIDS.

This study is being proposed for the following reasons:

- Persons with HIV/AIDS are in need of dental services;
- There has been little change in the dearth of dental professionals who have been willing to treat persons with HIV/AIDS;
- Nationally, dental hygienists continue to report their fear of contracting HIV occupationally;
- Findings may show that changes or additions to the pre-professional training and continuing education requirements of dental hygienists are warranted.
Chapter III

Methods

Purpose of the Study

The purpose of this study was to examine the attitudes of currently licensed dental hygienists in Florida with respect to providing dental treatment to HIV-positive persons. Intentions to treat HIV-positive patients were explored, as intention is an indicator of probable behavior. Dental health care professionals’ awareness of access to dental care by HIV/AIDS patients has been an ongoing issue. Better data of this type may improve understanding and estimating problems of access to oral health care for the HIV-positive population.

Objectives of the Study

This study had several objectives. Included among these objectives was the intention to:

- Describe the demographic profile of dental hygienists who respond to the survey;
- Measure the attitudes, self efficacy, risk of becoming HIV-infected, normative beliefs, and intentions among respondents as related to treating persons with HIV/AIDS;
- Make recommendations to dental professionals about how to work effectively with HIV/AIDS patients.
Conducting this study may ultimately shed light on improving access to care, thereby helping to reduce oral health disparities for HIV/AIDS patients in Florida.

**Research Questions**

1. What are dental hygienists’ stated intentions, attitudes, perceived risk, perceived self efficacy and normative beliefs toward treating HIV/AIDS patients?
2. What is the association between dental hygienists’ intentions to treat and perceived self efficacy, perceived risk of being infected, attitudes and normative beliefs toward treating HIV/AIDS patients?
3. Is there an association between Years in Practice, and intention to treat HIV/AIDS patients?
4. Is there an association between Ever Treated an HIV+ Patient as a Student, and intention to treat HIV/AIDS patients?
5. Is there an association between Ever Treated an HIV+ Patient in Private Practice, and intention to treat HIV/AIDS patients?
6. Is there an association between Knowing a friend or family member with HIV/AIDS, and intention to treat HIV/AIDS patients?
7. What is the measure of association between dental hygienists’ intentions to treat, perceived self efficacy, perceived risk of being infected, and attitudes and normative beliefs about treating HIV/AIDS patients?

**Study Design**

This study was descriptive and cross-sectional using quantitative methods to explore the behavioral and normative beliefs, attitudes, and intentions of licensed dental
hygienists to treat patients with HIV/AIDS. Values were assessed using an instrument that was developed from surveys of previously validated items (Laschinger & Goldberg, 1993; Preston, Young, Kock & Forti, 1995; Lester, 1989; Kunzel & Sadowsky, 1993), and personally developed items.

A 3-phase pilot study was conducted. In Phase 1, the survey was reviewed by a panel of experts who were faculty members in the dental hygiene program at the researcher’s alma mater. Phase 2 consisted of second-year dental hygiene students at one local community college who took the survey online, and assessed its appearance and ease of use of the instrument itself. Phase 3 was completed by second-year dental hygiene students at a different community college in Florida, who field tested the survey as a “dry run” of the actual implementation of the instrument. These results were used to assess reliability of the survey instrument.

The study was conducted using an online email questionnaire to survey dental hygienists described previously in the “Population and Sample” section. The advantages of using a questionnaire format is that it permits anonymity; it allows a person a considerable amount of time to think about his/her response before answering, and it provides uniformity across measurement situations (Henerson, Morris, & Fitz-Gibbon, 1987).

The staff of the Information Services Department within USF HEALTH of the University of South Florida (USF IT Department) set up a blinded format to email the survey to single users, so that other possible respondents and non-respondents would not have access to other’s email addresses. A blinded format also was used to receive data from completed online surveys.
Email surveys provide many efficient elements for conducting surveys, and include almost completely eliminating paper, postage, the labor of mailing, and data entry costs. The main advantage of an email survey is increased speed (Dillman, 2000). Although email surveys are simpler to compose and send, they are more limited in visual stimulation and interaction capabilities compared to Web based surveys (Dillman, 2000). Another disadvantage of a Web-based survey is that it is constructed on a Web site for which the participant must have a different software application (Dillman, 2000). For this study, greater complexity items such as extensive skip patterns were not used. Also, things like pop-up instructions, and other technologically challenging marketing techniques were not necessary components for conducting this online dissertation survey, therefore, an email format was selected.

Only a portion of the American population can be contacted via email (Dillman, 2000). Since there were not enough subjects with FDHA email addresses in order to achieve sufficient power for the study, postcards were mailed to the remaining members without email addresses on file, and contained the survey link. Three mailings occurred. The postcards (see Appendix) were mailed on the dates indicated on the timeline for survey dissemination. In addition, not all of the email addresses were current. This limitation meant that it was not possible to list all FDHA members with email addresses and draw a sample for which every dental hygienist had a nonzero chance of being selected for the survey. Conducting internet surveys has been limited to survey populations with high rates of computer use such as businesses, universities, large organizations, groups of professionals, and persons who purchase computer equipment. This survey applied to groups of professionals.
Population and Sample

The total number of licensed dental hygienists in Florida who were members of the Florida Dental Hygienists Association as of May, 2007, was 984. Those with email addresses registered with the association was 613 at the time of this survey. The remaining 371 members did not have registered email addresses on file with FDHA. Current email addresses and mailing labels of licensed dental hygienists were obtained through the Executive Director of the Florida Dental Hygienists Association (see agreement in Appendix A). The entire population was surveyed.

Just how accurately research and evaluation questions can be answered depends on the adequacy of the sampling design (Sarvela, & McDermott, 1993). The sampling design should consist of the following steps:

1. Carefully defining the population.
2. Selecting a sample from the population.
3. Observing or measuring the variable in the sample.
4. Estimating the variable in the population based on measurements taken in the sample.
5. Stating the accuracy of the estimates.

A sample was not selected from the entire population of dental hygienists with email addresses who were members of the FDHA, due to the population being limited in number. Therefore, the sample of convenience was defined as all dental hygienists who were members of the FDHA.
Sampling Bias

The sample may have been biased because of: (1) being able to access only those who were members of the state association; (2) not selecting a random sample of association members, and (3) members who did not have internet access with a working internet address. There are differences between health care professionals who do / do not maintain membership in their national / state professional organizations. A recent study found differences between members of the American Dental Hygienist’s Association and non-members (King & Muzzin, 2005). That study found that ADHA members were less likely to alter clinical practices when treating infectious disease patients. The findings also suggested that membership in a professional organization may have impacted the attitudes and practices of subjects through exposure to current research in disease transmission. Having greater access to research publications and continuing education programs through local, state and national associations may make members more knowledgeable about infectious disease transmission, thus decreasing the likelihood of feeling a need to alter clinical practices. These results may have been biased, and thus it limited inference to the general practicing dental hygiene population. Limitations of the present study were consistent with those found in survey research limited to sampling members of professional associations. While the instrument was pilot-tested and revised, misinterpretation of questions and a desire by the participant to answer questions correctly could not be controlled.

Investigator bias was minimized by using a blinded study design, which kept the respondents’ data unidentifiable to the researcher. The data is what it is, and it is
important to be aware not to inject the researcher’s personal biases, as it could invalidate the study findings.

Levels of Permission

Several levels of permission were required to conduct this research study. These were:

1) IRB application
2) USF’s IT/IS Department(s)
3) Florida Dental Hygiene Association
4) University of Minnesota Dental Hygiene Program
5) Hillsborough Community College Dental Hygiene Program
6) St. Petersburg College Dental Hygiene Program
7) Informed consent from study participants

Protection of Human Subjects

The survey instrument and study proposal were approved by the University of South Florida’s Institutional Review Board (IRB; see Appendix). Permission was granted as requested which meant that study participants were protected in matters of privacy, confidentiality, protocols, risks and benefits, and informed consent.

Other Permissions

The University of South Florida’s Department of Informational Technology and/or the Department of Information Services (USF IT/IS) advised the researcher with setting up the online survey, and acted as the recipient of completed and blinded online surveys. The Executive Director from the Florida Dental Hygiene Association was
contacted for permission to access the association’s database of licensed dental hygienists. Permission was received from FDHA, and those with email addresses were sent the survey (T. Miller, personal communications, 12/22/04, 11/28/05, enclosed in Appendix). The Director of the University of Minnesota Dental Hygiene Program was contacted, and gave permission to survey faculty members for the initial pilot study (K. Newell, personal communication, 11/10/05, enclosed in Appendix). Directors of Dental Hygiene Programs at Hillsborough Community College, and St. Petersburg College were contacted to obtain access to their dental hygiene student populations for pilot study purposes. Permission was received from both Directors (T. Grzesikowski, D. Solovan-Gleason, personal communications, 10/21/05, 10/25/05, enclosed in Appendix). Study subjects agreed via informed consent to participate in the online survey. This consent was included in the introductory letter at the beginning of the online survey. Informed consent was implied when study participants took the online survey. Permissions are included in the Appendix.

Selection of Variables

Dependent Scale

- Intention to treat HIV/AIDS patients

Independent Scales

- Attitude toward behavior
- Perceived risk of occupational transmission of HIV
- Self efficacy (one’s beliefs in their ability toward treating patients with HIV/AIDS)
• Normative beliefs (one’s beliefs that specific individuals or groups think he/she should or should not perform the behavior)

Demographic / Independent

• Age
• Gender
• Marital status
• Race
• Education
• Year of graduation from dental hygiene program
• # years in practice
• Practicing full-time; part-time; not practicing
• Treated HIV/AIDS patients in school
• Treated HIV/AIDS patients in private practice
• Know someone who is HIV+

Instrument

The instrument was compiled from scales used in previous studies, and contained attitude, intention, belief and subjective normative variables and concepts (constructs). The scales/instrument underwent face and content validity processes as well as internal consistency reliability testing. Demographic variables also were collected.

Intention / Willingness to Provide Care

A 15-item scale was developed for a dissertation study (Driscoll, 1996) to assess willingness of dental students to treat persons with different diseases and disabilities.
Divided into two groups, the first section of five items dealt with treating persons with HIV/AIDS, and the remaining ten items dealt with treating patients with other special health care needs, and included the wheelchair bound, those with cerebral palsy, myocardial infarction, mental retardation, and other infectious diseases. These were patients who typically challenged the clinical care routines of dentists and their staffs. These items were arranged on a Likert-type scale with endpoints ranging from 1 (strongly disagree) to 5 (strongly agree). Low scores indicate low willingness, whereas high scores indicate high willingness. Driscoll (1996) established that Cronbach’s alpha corresponding to the five items treating HIV/AIDS patients was .83, and Cronbach’s alpha for the other ten items pertaining to special populations was .86. When tested, the five item measure that focused on willingness to treat patients with HIV/AIDS correlated positively and significantly with the ten items that focused on willingness to treat other special needs populations (.63, p=.0001).

In addition, this researcher added five items asking respondents of their willingness to treat a person with HIV/AIDS who is either a patient of record, or who is a new patient; one item was developed and was tested to see if it was related to perceived risk, and the final two items were tested to see if there was an association with the dependent and independent variables.

The way items are worded can affect the way respondents’ express their willingness to treat HIV/AIDS patients. When items are general and non-threatening, respondents often yield to a social desirability factor, that is, they either want to provide the “right answer,” or the answer that they think most respondents would provide (McDermott, & Sarvela, 1999). For example, specifying patient types or disease status
can influence someone’s willingness to treat a patient. The following example relates to the types of health status (asymptomatic vs symptomatic) and patient status (new patient vs patient of record). Participants could be queried about their willingness to treat four specific types of HIV+ patients:

- asymptomatic, HIV+ patient of record;
- symptomatic patient of record who has HIV/AIDS;
- asymptomatic, HIV+ new patient;
- symptomatic new patient who has HIV/AIDS

**Perceived Self Efficacy / Clinical Ability**

To assess perceived clinical competence, participants were asked a series of ten questions (items 8-17) about the clinical management of patients with HIV/AIDS (Driscoll, 1996). The items were arranged on a Likert-type scale with endpoints ranging from 1 (strongly disagree) to 5 (strongly agree). Low scores indicate low perceived competence, whereas high scores indicate high perceived competence. Driscoll (1996) reported Cronbach’s alpha for these items was .90. These ten items were used verbatim in this study.

**Dental Hygiene Care Concerns / Perceived Risk**

This section of the instrument was taken from the Nurses’ Attitudes about AIDS Scale (NAAS) which was developed and psychometrically evaluated in the mid 1990s (Preston, Young, Kock & Forti, 1995). Permission was requested and received to use this instrument or portions of it (see Appendix B). Six items were chosen from the section on Nursing Care Concerns, and “nurses” was changed to “dental hygienists” in one item. Cronbach’s alpha for this section of the NAAS was .90.
Of the 273 items developed for inclusion in the NAAS scale, 60 items were selected and pilot tested for face validity, and a purposive sample of 731 working nurses completed the survey. A factor analysis yielded a single homosexuality factor that explained 53% of the variance in the 21 items measured. This subscale was labeled attitudes about people with AIDS, and Cronbach’s alpha coefficient was .96. Two additional subscales were identified in the AIDS realm: attitudes about nursing care concerns (12 items; Cronbach’s alpha = .83) and attitudes about social-professional concerns (8 items; Cronbach’s alpha = .72). These subscales explained almost 39% of the variance. Construct and predictive validity also were established.

The NAAS has several suggested applications. They are: (1) as a descriptive tool to investigate AIDS-related attitudes in a variety of nursing populations; (2) as a means of describing models of nursing practice behavior related to persons with HIV/AIDS; (3) as a means of predicting practice outcomes related to caring for HIV-infected persons in varying nursing populations, particularly the use of universal precautions; (4) as a needs assessment for educational programs related to HIV/AIDS; and (5) as an evaluative tool to assess changes in attitudes as a result of educational programs. This instrument has been adapted for use with other health care providers such as health educators, social workers and physicians (Preston, Young, Kock & Forti, 1995).

The NAAS was readapted for use in this study to query dental hygienists about their perceived risk in becoming HIV-infected (items 18-21). These questions were used (1) to investigate AIDS-related attitudes toward risk in dental hygienists; (2) as a means of predicting practice outcomes related to caring for HIV-infected persons, and (3) as a needs assessment for educational programs related to HIV/AIDS.
**Attitude / Normative Beliefs**

This section of the survey was composed of 13 items (ATT22-24,27,29,30,34; NORM25-26,28,31-33) from various sources that measured attitude, motivation to comply, subjective norm, and normative beliefs. Items 22-28 were taken from a survey by Laschinger and Goldenberg (1993) to test the Theory of Reasoned Action. The first six items (22-27) are about personal behavioral beliefs of the consequences of caring for HIV+ patients, and are an indirect measure of attitude. Item 28 measures normative beliefs of their perceptions of the expectations of important others for their performing the behavior. Item 29 was taken from a study by Kunzel and Sadowsky (1993) related to beliefs about occupational risk of contracting HIV infection. Items 30-31 were developed by Lester (1989) for use in his study about attitudes towards AIDS. Item 32 was taken from the NAAS (1995) and is attitude-related. The last two items (33-34) were developed by the researcher of this study. Item 33 relates to attitude, while item 34 relates to perceived risk of being infected.

**Demographics**

Eleven demographic variables were identified to develop a profile of the respondents, and to test their association with the dependent variable. These variables include age, gender, marital status, race, education, year of graduation from dental hygiene program, current working status, working full-time or part-time, treating patients with HIV/AIDS both in school, and in private practice, and knowing someone who has HIV/AIDS.
Power Analysis and Sample Size

Cohen (1988) describes the four parameters of statistical inference as: power, significance criterion (a), sample size (n), and effect size (ES). Any of the four parameters can be determined as long as the other three parameters are fixed. A level of .80 is understood to be adequate. The amount of power that is desired for this study is .80, and the significance criterion is set at .05.

Prior to beginning data collection, sample size must be determined to ensure a large enough sample to conduct the proposed analysis (Munro, 2005). Cohen (1988) provides a formula to determine sample size when given an effect size index, named $L$. The effect size index table is located in Cohen (1988). He defines a small effect size as an $R^2$ of 0.02, a moderate effect size as an $R^2$ of 0.13, and a large effect size as an $R^2$ of 0.26. The formula is:

$$N = \frac{L(1 - R^2)}{R^2} + \mu + 1$$

Where $N$ = total sample size  
$L$ = effect size index  
$\mu$ = number of independent variables

Sample size was computed using Cohen’s formula (1988), and results follow:

$$N = \frac{18.1(1 - .02)}{.02} + 11 + 1$$

For a small effect size, 899 dental hygienists had to respond. For a medium effect size, 133 dental hygienists had to respond. For a large effect size, 64 dental hygienists had to respond.
A 91% response rate (899 dental hygienists reply) was needed to realize a small effect size of 0.02. The researcher highly doubted that a small effect size could be achieved with the total number available in the population of FDHA members, but anticipated at least a medium effect size.

Pilot Study

The importance of conducting a pilot study cannot be understated. A pilot study is conducted in different phases to discover any problems with the data collection instruments and procedures, and data analysis procedures (Sarvela & McDermott, 1993). The pilot test is synonymous with “dress rehearsal” and ensures that the instrument, procedures, and the technology are of sufficient quality to proceed with the study. McDermott and Sarvela (1999) agree with Sudman and Bradburn (1986) who stated “If you don’t have the resources to pilot test your questionnaire, don’t do the study.”

Meetings were held with staff at the HSC/IS Department to become familiar with the most recent version of the Ultimate Surveyor software program (Prezza Technologies, Inc., Version 3.0.4, 2005). The Ultimate Surveyor program was used to input the survey into an internet format, and is the survey program supported by HSC/IT Department.

The survey instrument was tested for readability level using the SMOG Readability Formula (McDermott & Sarvela, 1999), and was found to be at a 10th grade reading level. Usually, this reading level would be too high for a general audience. However, dental hygienists have received training in medical terminology, so they cannot be compared with a general audience. This reading level was determined to be acceptable for this audience.
Phase 1 of Pilot Testing: External Expert Panel Review

The first phase of piloting the survey instrument involved emailing the survey to a panel of ten experts who were faculty members at the University of Minnesota, School of Dental Hygiene. They were asked to review the online survey and provide feedback on clarity, redundancy, appropriateness, and thoroughness. The questionnaire was revised according to the suggestions by seven expert panel members, that is, wording was changed for clarity, redundant items were deleted, and three items were added. By completing this exercise, the number of survey items was reduced from 75 to 45 items.

Phase 2 of Pilot Testing: Mini-pilot Test

Phase 2 (mini-pilot) and Phase 3 (field test) of pilot testing were completed by dental hygiene students, because the population of dental hygienists in the state of Florida who were members of FDHA was limited in number, and therefore, the researcher did not want to reduce the pool of available respondents. Convenience samples of dental hygiene students from area dental hygiene programs were surveyed for the pilot study only. Fifteen second-year dental hygiene students from Hillsborough Community College were surveyed during Phase 2 of pilot testing to assess appearance, ease of use of the instrument, and pre-implementation procedures. Several suggestions were noted during the mini-pilot test, and these changes were implemented into the survey.

Phase 3 of Pilot Testing: Field Testing

Phase 3 of the pilot study was conducted at St. Petersburg College, where 33 of 35 second-year dental hygiene students completed the survey online (94% return rate). Students were on the honor system in taking the survey, so this high of a return rate is considered excellent. This field test served as a “dry run” of the actual implementation of
the instrument, and was used to assess reliability. The field test is the last chance to identify any problems with the instrument (McDermott & Sarvela, 1999). The three phases of pilot testing were necessary to make sure that all problems were solved before the survey was implemented.

Reliability and Validity of Instrument

How do we know that the data results can be trusted? It is important to assess the reliability and validity of data collection instruments used in a study so that the researcher(s) believe that the resulting data is true. Reliability is concerned with the ability of an instrument to obtain consistent results, whereas validity refers to the ability of an instrument to measure what it purports to measure (McDermott & Sarvela, 1999).

Phases 1, 2 and 3 of pilot testing provided the researcher with preliminary data which was used to assess the reliability and validity of the survey instrument. A review by a panel of experts permitted the face validity (the instrument appeared to measure the construct under consideration, and appeared to be appropriate for the audience it was intended) and content validity (the instrument examined all content areas adequately) to be assessed along with other relevant instrument characteristics. Data collected from the pilot subjects allowed for survey restructuring and calculation of reliability coefficients.

Internal Consistency Reliability

In this study, internal consistency reliability was assessed, and examined the average association among items by measuring the degree to which items relate to each other (the degree to which items “hang together.”) Researchers understand that the items on a survey instrument should all be related to each other. Measuring internal
consistency reliability produces a coefficient that ranges from a value of 0 (which means that there is no reliability), to 1 (which means perfect reliability). A minimum value of .60 is desirable for a basic research or evaluation study, whereas, .80 is the preferred reliability coefficient for applied studies, and above .90 is the preferable measure for studies that involve clinical decision making. The greater the consistency in responses among items, the higher coefficient alpha will be. The logistical advantage of using internal consistency reliability is that the survey is administered once, to one group of subjects (McDermott & Sarvela, 1999).

Prior to conducting the reliability analysis, item transformation occurred, where two items (NORM 28R, ATT 30R) were reverse scored so that the analyses of the total score that is computed by the reliability procedure is meaningful. Reverse scoring of items occurs when all items on a measure have the same response scale where high scores on some items represent high scores on the construct being measured, whereas high scores on other items represent low scores on the same construct. The scores on the latter items were reverse scaled. These types of items are commonly found on attitude scales.

For this study, five scales of items plus demographic variables were implemented. Since multiple scales were used, separate internal consistency estimates were computed for each scale score (Green, S.B., Salkind, N. J., & Akey, T. M., 2000). The last section consisted of 13 items, seven that measured attitude, and six that measured normative beliefs. The researcher ran reliability tests on the initial scale (ATT 22-34). Results showed that the reliability coefficient was below .60, and therefore the 13 items were
split into two new scales (attitude = ATT 22-24,27,29-30,34; normative beliefs = NORM 25-26,28,31-33). Both scales’ reliability coefficients were above the .60 limit.

Three assumptions were met that underlie estimating internal consistency reliability:

1. Parts of the measure must be equivalent.
   Every item was assumed to be equivalent to every other item. All items measured the same underlying dimension per scale.

2. Errors in measurement between parts are unrelated.
   Respondents were not forced to complete the scales in an allotted time, nor were any items linked between scales.

3. An item or half test score is a sum of its true and its error scores.
   Whereas this assumption is necessary for the internal consistency estimate to accurately reflect a scale’s reliability, it is difficult to know if this assumption was violated or not.

Internal consistency reliability was computed using SPSS 15.0 for Windows (SPSS Inc., 2007). Estimates of Cronbach’s Alpha for the five subscales demonstrated preferred reliability coefficients for all subscales as shown in Table 3.1.

Once the reliability of the survey instrument was established, validity studies were conducted. Validity is the most important issue to consider when evaluating a test instrument, because it refers to the quality of the data produced from using the instrument. Face validity and content validity of the instrument used in this study were established by the expert panel of dental hygiene faculty members.
Table 3.1

Estimates of Cronbach’s Alpha by Subscale

<table>
<thead>
<tr>
<th>Scales</th>
<th>Cronbach’s Alpha</th>
<th>Cronbach’s Alpha based on Standardized Items</th>
<th>N of Items</th>
<th>Item Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>.926</td>
<td>.945</td>
<td>7</td>
<td>INT 1-7</td>
</tr>
<tr>
<td>Self Efficacy</td>
<td>.855</td>
<td>.857</td>
<td>10</td>
<td>SELF 8-17</td>
</tr>
<tr>
<td>Risk</td>
<td>.629</td>
<td>.672</td>
<td>4</td>
<td>RISK 18-21</td>
</tr>
<tr>
<td>Attitude</td>
<td>.788</td>
<td>.772</td>
<td>7</td>
<td>ATT 22-24,27,29-30,34</td>
</tr>
<tr>
<td>Normative Beliefs</td>
<td>.661</td>
<td>.680</td>
<td>6</td>
<td>NORM 25-26,28,31-33</td>
</tr>
</tbody>
</table>

There are many influences on dental hygienists that could have confounded this study. These influences are financing, market justice versus social justice, crossover effects between general prejudice and HIV, low-income, Medicaid, and a multiple needs population. Financing dental care has become more difficult for people with HIV/AIDS because of the changing face of dental insurance (increased cost; fewer benefits), and Medicaid eligibility limits that were reduced once again which has put more patients in the category of medically uninsured. Changing the way a person receives care with a different payment and eligibility system can be a daunting task, and some people may decide not to begin a new system of health care because it seems too difficult at the time. Low income persons may also be unable to afford medical / dental insurance through their employers, and therefore are uninsured. Also, funding by the federal government for oral health care is not as generous as before, and even last pay sources such as Ryan White funds have had to exist on fewer dollars when there are more HIV/AIDS patients being identified in need of oral health services. The influence of a multiple needs population decreases the number of providers who are willing and/or able to treat them,
and therefore, access to care is affected. Finally, the crossover effect of general prejudice and HIV is very real, as was shown in the recent study of dental hygienists in 13 states (King & Muzzin, 2005), and in other studies / anecdotes cited within.

**Survey Administration**

Just as multiple contacts of respondents may be necessary for face-to-face interviews, telephone surveys, and mail surveys, they also are essential for e-mail surveys. An important part of the contacts is the first, or prenotice email message that announces the upcoming survey. The time that elapses between the prenotice and questionnaire can be shortened to two or three days to increase the likelihood that the respondent will remember that he/she received the prenotice and to connect it to receipt of the actual survey instrument. The purpose of the prenotice is to leave a positive impression of importance so that the respondent will not immediately delete the email survey when it arrives. A plus for email surveys is that they are returned faster than a paper survey which implies that it may be possible to shorten the normal intervals between contacts of respondents (Dillman, 2000). This procedural fact allows for reducing the lengthy implementation time required for this type of study, and is the least costly of all survey methods.

Dillman (2000) proposes up to four contacts for this type of survey – a prenotice, the questionnaire, a thank you/reminder, and a replacement questionnaire. To maximize response rates, persons are emailed individually instead of contacted through a mass emailing. The mass email message that shows many names in the address area or a listserv heading should be avoided, because mail survey research has shown that
personalization is important to achieve replies (Dillman, 2000). Therefore, the email message appeared to be addressed only to individual participants.

A copy of the timeline to implement the survey is located in the Appendix. On July 10, 2007, a prenotice email was sent by the national office of the American Dental Hygienists’ Association to all Florida Dental Hygienists’ Association (FDHA) members who have an email address on file. For Association members without email addresses on file, the first postcard mailing was sent simultaneously with the FDHA prenotice. On July 12, the survey was emailed from USF IT Dept. at 7:21am. Immediate returns reported over 100 undeliverable email addresses. This information was documented and forwarded to the USF IT Department which checked all responses for accuracy. In all, there were 114 email addresses that were found to be invalid. The researcher found six obvious email errors on the list, was alerted about the death of one possible respondent, and reported this and the reasons for the undeliverable addresses to FDHA. The reasons for the bounced emails provided by USF IT Department follows:

- the accounts either no longer existed, or were incorrect on the list that was provided to me;
- the recipient’s mailbox was over quota (space);
- the recipient’s refusal to accept email (via a spam blocker). All recipients were re-contacted and were asked to accept the survey email.

On July 17 after the first mailing, it was determined that the survey link on the postcard was missing one letter. Postcards were reprinted and were re-mailed immediately, announcing the error.
On July 24, the second group of postcards was mailed to thank those who had taken the survey, and to remind those who had not responded to do so. Similarly, two days later on July 26, the second email survey with a thank you/reminder message was sent. The postcard and email also thanked those who had already replied to the survey, and reminded those who had not yet replied to do so. The final contacts were made on August 13 (postcard mailing) and on August 15 (email survey) similar to the previous one. Data collection closed at midnight on 8/31/07.

At the end of the data collection period, the researcher had received 219 responses to the survey, and it was determined that saturation had been reached, therefore, the final contact was eliminated. These contacts were made when there were no other known major conflicts that could have interfered with response rates. For example, emails and mailings would not have been sent if a hurricane was threatening. The response rate for this survey was 22% overall; if the 114 invalid email addresses were subtracted from the total number of FDHA members (984), the actual response rate was 25%.

Missing Data

The issue of handling missing data usually occurs when using survey methodologies (Buhi, Goodson, & Neilands, 2008). This phenomenon is known as missingness, and may result from a variety of reasons. Reasons for missingness in this study included the subject’s refusal to answer survey items that possibility was indicative of items being too sensitive, skipped questions, and computer malfunction. When missingness occurs in continuous or in categorical variables, researchers have identified these as non-response items.
Whereas 24 records were identified with missing data items in this study, only two records were completely deleted from the data analysis as the majority of the items were left unanswered. The remainder of the 22 records revealed randomness of missing data items and therefore, it was decided to retain these records in the analysis. For example, when missing data item(s) occurred in scale 1, there was no scale score for that person for scale 1. In this way, the researcher was able to analyze the majority of all data submitted, rather than following the SPSS 15.0 guidelines that suggested not to include records with any missing data items. After removing the 2 records with missing data items from the 219 total records, 217 complete records remained for data analysis.

**Data Analysis**

Data were returned to USF HEALTH IS (Health Sciences Center/Information Services) via the internet, where it was saved in a Microsoft Excel file. When the closing date of data collection was reached, HSC/IS forwarded the data to the researcher, files were reviewed for missing data, and they were imported into SPSS (Statistical Program for the Social Sciences, 2007).

Data were analyzed using SPSS 15.0 (2007) software to assess variations in attitudes, perceived risk, self efficacy, normative beliefs, and intentions of dental hygienists on a number of variables. Table 3.2 in the Appendix displays the research questions, variables, description of the variables, and proposed data analysis plan. The dependent variable was intention, and the independent variables included the items related to attitude, self efficacy, risk, and normative beliefs, and eleven demographic variables. SPSS was used for descriptive data analysis, frequency distributions,
correlations, non-parametric tests, and multiple linear regression tests. The level of significance was set at <0.05.

The five constructs in this study are related to the Theory of Reasoned Action and include intention, self-efficacy, perceived risk, attitude and normative beliefs. These constructs were operationalized in the survey by grouping items 1-34 according to these five constructs (see Figure 2.3). Reverse scoring of selected items was completed. Summated rating scales for each respondent were calculated according to the five constructs producing five scores per respondent in addition to the information supplied by the demographic variables. For example, seven items were summed (INT 1 + INT 2 + INT 3 + INT 4 + INT 5 + INT 6 + INT 7) to make up the Intention scale score. A summative rating scale is a group of items that are approximately equal on attitude value where subjects respond in terms of agreement or disagreement. The Likert scale is a form of a summative rating scale, and is the scale used most often to measure attitude (McDermott & Sarvela, 1999).

**Descriptive Statistics / Non-Parametric Tests**

Univariate statistical analysis was conducted on all individual variables to describe the data. Frequency distributions, measures of central tendency and measures of dispersion were calculated for each of the items and demographic variables. Non-parametric tests (Spearman correlation, Kruskal-Wallis H, Mann Whitney U), were chosen over parametric testing (t-tests, ANOVA), because the sample size was small; the data was mainly ordinal level; there was no assumption about the distribution of the variable in the population to which we plan to generalize our findings, and the data
retained their original values thus making interpretation easier. Tests were performed on the available data as outlined in the data analysis plan (see Table 3.2 in Appendix).

Table 3.2 (see Appendix) depicts variables 1-34 as ordinal data. When both the criterion and predictor variables are ordinal-level data, or when one variable is an ordinal-level variable and the other is an interval- or ratio-level variable, the Spearman rank-order correlation coefficient is recommended to be used (Hatcher & Stepanski, 1994). Only interval-level and ratio-level data are tested using the Pearson correlation test, and therefore, the appropriate test for variables in this study, when tested against each other, is the non-parametric test, Spearman correlation. The advantage to using the Spearman rank-order correlation test is that it is a distribution-free test, which means that it makes no assumption concerning the shape of the distribution from which the sample data were drawn (Hatcher & Stepanski, 1994). The limitation to using Spearman correlation is that it uses ordinal, or ranking level data, and therefore, does not have equal quantitative meaning as interval-level data (Hatcher & Stepanski, 1994). This means that the difference in intention scores between respondent 1 and respondent 2, will not necessarily be the same as the difference in intention scores between respondent 2 and respondent 3.

The first seven variables (INT1-INT7) measured dental hygienists’ intentions to treat HIV/AIDS patients, and were tested individually for association with the remaining independent construct variables (SELF8-17, RISK18-21, ATT22-24,27,29,30,34, NORM25-26,28,31-33). Ten variables (SELF8-17) measured dental hygienists’ self efficacy, and were tested individually for association with the remaining variable items (INT1-7, RISK18-21, ATT22-24,27,29,30,34, NORM25-26,28,31-33). Four variables (RISK18-21) measured dental hygienists’ perceived risk of occupational transmission of
HIV, and were tested individually for association with the remaining variable items (INT1-7, SELF8-17, ATT22-24,27,29,30,34, NORM25-26,28,31-33). Seven items (ATT22-24,27,29,30,34) measured dental hygienists’ attitudes toward treating HIV/AIDS patients, and were tested individually for association with the remaining variable items (INT1-7, SELF8-17, RISK18-21, NORM25-26,28,31-33). The remaining six items (NORM25-26,28,31-33) measured dental hygienists’ normative beliefs, and were tested individually for association with the remaining variable items (INT1-7, SELF8-17, RISK18-21, and ATT22-24,27,29,30,34).

The Kruskal-Wallis H test was used for research questions 4 and 5 to compare two or more groups and is analogous to the parametric test, analysis of variance (ANOVA). The Mann-Whitney U test was used for research question 6 to compare two groups and is analogous to the parametric $t$-test (Munro, 2005).

Univariate and bivariate analyses of the distribution of the dependent variable changed the planned multiple linear regression (Table 3.2 in Appendix) to a binary logistic regression for research question 7.

**Regression Model**

There are many types of regression analyses in the literature. For example, Munro (2005) stated that multiple linear regression is used extensively by researchers because it allows one to find the best fitting and most parsimonious model to describe the relationship between a dependent variable and several independent variables. The dependent variable is supposed to be continuous-level and must meet the assumptions for this type of analysis.
That was not the case in this study. Rather, the dependent variable was categorical, and did not meet the assumption for normality (see Figure 3.1). The histogram shows that the majority of responses were clustered in a few response categories. Because of the abnormal distribution of the dependent variable, binomial (binary) logistic regression was chosen as the statistical method of choice. Logistic regression has the ability to: 1) predict the dependent variable on the basis of continuous and/or categorical independent variables to determine the percent of variance in the dependent variable that is explained by the independents; 2) rank the relative importance of the independent variables; 3) assess interaction effects, and 4) understand the impact of covariate control variables. Logistic regression does not assume a linear relationship between the dependent and independent variables, does not require the variables to be normally distributed, does not assume homoscedasticity, and overall, has less stringent requirements as compared with multiple linear regression.

Before the regression analysis was conducted, univariate (see Tables 4.1 – 4.7) and bivariate analyses (Table 4.16) were reviewed to identify statistically significant dependent and independent variables; further tests were run on selected variables to help with this identification process. The literature was reviewed again for similar studies to determine whether or not to include certain independent variables in the regression analysis.

The regression model was built according to decisions by the researcher whether or not to include specific variables in the model. The five scale variables and the demographic variable “treated in private practice” were included in the regression
analyses, because bivariate analysis and further testing determined them to be statistically significant.

Figure 3.1 Distribution of the Dependent Variable

Next, the dependent variable was recoded into a dichotomous variable using the median (33; range = 7-35) to divide the two groups that were coded “0” (0-33 = lower intention group) and “1” (34-35 = higher intention group).

The following logistic regression model was tested:

Dependent Variable: INT Scale
Independent Variables: SELF Scale
                  RISK Scale
                  ATT Scale
                  NORM Scale
                  Treated in Private Practice

Results are included in Chapter 4.
Chapter IV

Results

This chapter describes the study participants, their responses to the survey items, and results related to the research questions. In all, 217 responses were received via email, and 2 responses were returned by U.S. mail from participants who requested this mode of response. Of the 219 responses, 217 underwent analysis. As indicated in Chapter 3, to have a medium effect size, 133 usable responses were necessary. Consequently, the return of 217 records easily achieved that desired end. The level of statistical significance (alpha) was set at .05. The number of responses to the items varied as not all participants answered each question.

Description of Respondents

Descriptive statistics revealed a homogenous pool of respondents. Most respondents were female (96.3%) and White (89.4%). Ages ranged from 22 to 80 years (M=46.46, SD=11.15). In all, 77.4% were married, 51.2% had earned an Associate’s Degree, and 30.4% had a Bachelor Degree. Survey participants graduated from a dental hygiene program between 1948 and 2007 (M=1987, SD=13.68), and their total years of practice ranged from 1 to 52 (M=19.27, SD=13.29). Among respondents, 53.9% practiced full-time, and 32% practiced part-time. Whereas 24.0% reported that they treated HIV/AIDS patients as dental hygiene students, 29.0% said they did not, and
47.0% were unsure if they had. A large proportion of respondents (80.2%) reported they had treated HIV/AIDS patients in private practice. Almost 18% of subjects reported that they had a friend or family member who was HIV+ or who had developed AIDS. An iteration of demographic traits is shown in Table 4.1.

Previously, the Theory of Reasoned Action (TRA) was applied successfully in a study using predictors and subsequent decisions of physical therapy and nursing students to work with geriatric clients (Dunkle & Hyde, 1995). Results showed that for all students, the factors that influenced intention were student attitudes and their subjective norms. In this study, the TRA framework was applied to identify dental hygienists’ behavioral beliefs, self-efficacy, perceived risks, attitudes, subjective norms and intentions toward treating HIV-infected patients. Analytical results for each of the previously identified research questions are shown below.
Table 4.1

Demographic Characteristics of Responding Dental Hygienists

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>209</td>
<td>96.3</td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
<td>3.7</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>100.0</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>168</td>
<td>77.4</td>
</tr>
<tr>
<td>Living with partner or significant other</td>
<td>4</td>
<td>1.8</td>
</tr>
<tr>
<td>Separated / Divorced</td>
<td>25</td>
<td>11.5</td>
</tr>
<tr>
<td>Single, never been married</td>
<td>14</td>
<td>6.5</td>
</tr>
<tr>
<td>Widowed / Widower</td>
<td>6</td>
<td>2.8</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>100.0</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (Caucasian)</td>
<td>194</td>
<td>89.4</td>
</tr>
<tr>
<td>American Indian / Alaskan Native</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Asian</td>
<td>4</td>
<td>1.8</td>
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<tr>
<td>Black (not Hispanic)</td>
<td>5</td>
<td>2.3</td>
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<tr>
<td>Hispanic / Latino</td>
<td>8</td>
<td>3.7</td>
</tr>
<tr>
<td>More than one race</td>
<td>3</td>
<td>1.4</td>
</tr>
<tr>
<td>Native Hawaiian / Other Pacific Islander</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>100.0</td>
</tr>
<tr>
<td>Years of Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Associate Degree (AA,AS)</td>
<td>111</td>
<td>51.2</td>
</tr>
<tr>
<td>Bachelor Degree (BA,BS)</td>
<td>66</td>
<td>30.4</td>
</tr>
<tr>
<td>Dental Hygiene Diploma</td>
<td>14</td>
<td>6.5</td>
</tr>
<tr>
<td>Post Baccalaureate Degree (Masters or higher degree)</td>
<td>26</td>
<td>12.0</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>100.0</td>
</tr>
<tr>
<td>Currently Practicing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>117</td>
<td>53.9</td>
</tr>
<tr>
<td>Part-time</td>
<td>70</td>
<td>32.3</td>
</tr>
<tr>
<td>Not practicing</td>
<td>30</td>
<td>13.8</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>100.0</td>
</tr>
<tr>
<td>Treated as Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>52</td>
<td>24.0</td>
</tr>
<tr>
<td>No</td>
<td>63</td>
<td>29.0</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>102</td>
<td>47.0</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>100.0</td>
</tr>
<tr>
<td>Treated in Private Practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>174</td>
<td>80.2</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>4.1</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>34</td>
<td>15.7</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>100.0</td>
</tr>
<tr>
<td>Friend / family member who has HIV/AIDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38</td>
<td>17.5</td>
</tr>
<tr>
<td>No</td>
<td>179</td>
<td>82.5</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Research Question 1: What are dental hygienists’ stated intentions, attitudes, perceived risk, perceived self-efficacy and normative beliefs toward treating HIV/AIDS patients?

Descriptive statistics were generated for the 34 items that measured the TRA constructs. Results are shown by construct in Tables 4.2 through 4.6.

Table 4.2

Dental Hygienists’ Intentions to Treat HIV/AIDS Patients (INT Scale)

<table>
<thead>
<tr>
<th>Item Number / Item</th>
<th>N</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT 1: I would be willing to provide dental hygiene care for a person with HIV/AIDS</td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>4.51</td>
<td>.647</td>
</tr>
<tr>
<td>INT 2: I would be willing to provide dental hygiene care for a patient of record with HIV/AIDS</td>
<td>217</td>
<td>1</td>
<td>5</td>
<td>4.55</td>
<td>.615</td>
</tr>
<tr>
<td>INT 3: I would be willing to provide dental hygiene care for a new patient with HIV/AIDS</td>
<td>212</td>
<td>1</td>
<td>5</td>
<td>4.50</td>
<td>.685</td>
</tr>
<tr>
<td>INT 4: I would be willing to provide dental hygiene care if a patient told me he/she was bisexual</td>
<td>215</td>
<td>2</td>
<td>5</td>
<td>4.67</td>
<td>.519</td>
</tr>
<tr>
<td>INT 5: I would be interested in an opportunity to treat patients with HIV/AIDS in my current work setting</td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>3.97</td>
<td>1.110</td>
</tr>
<tr>
<td>INT 6: I would take care of any patients with Hepatitis B</td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>4.58</td>
<td>.589</td>
</tr>
<tr>
<td>INT 7: I would take care of any patients with Hepatitis C</td>
<td>217</td>
<td>1</td>
<td>5</td>
<td>4.53</td>
<td>.616</td>
</tr>
</tbody>
</table>

Descriptive statistics were generated for the ten items that measured dental hygienists’ self-efficacy with respect to treating patients with HIV infection. Results are shown in Table 4.3.
Table 4.3

*Dental Hygienists’ Self-Efficacy for Treating HIV/AIDS Patients (SELF Scale)*

<table>
<thead>
<tr>
<th>Item Number / Item</th>
<th>N</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELF 8: I can identify oral lesions associated with HIV disease</td>
<td>216</td>
<td>2</td>
<td>5</td>
<td>3.98</td>
<td>.705</td>
</tr>
<tr>
<td>SELF 9: I know the treatments for common HIV-related oral lesions</td>
<td>217</td>
<td>1</td>
<td>5</td>
<td>3.57</td>
<td>.825</td>
</tr>
<tr>
<td>SELF 10: I know community resources for people with HIV disease</td>
<td>215</td>
<td>1</td>
<td>5</td>
<td>3.57</td>
<td>1.014</td>
</tr>
<tr>
<td>SELF 11: I can obtain a thorough medical history including HIV risk factors</td>
<td>217</td>
<td>1</td>
<td>5</td>
<td>4.06</td>
<td>.900</td>
</tr>
<tr>
<td>SELF 12: I can provide HIV risk-reduction counseling</td>
<td>214</td>
<td>1</td>
<td>5</td>
<td>3.56</td>
<td>1.045</td>
</tr>
<tr>
<td>SELF 13: I use universal precautions</td>
<td>216</td>
<td>4</td>
<td>5</td>
<td>4.89</td>
<td>.315</td>
</tr>
<tr>
<td>SELF 14: I feel professionally prepared to educate patients about HIV disease (e.g. HIV transmission, HIV antibody testing, infection control protocol)</td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>3.93</td>
<td>.988</td>
</tr>
<tr>
<td>SELF 15: I can safely provide dental hygiene care to persons with HIV disease</td>
<td>216</td>
<td>2</td>
<td>5</td>
<td>4.59</td>
<td>.546</td>
</tr>
<tr>
<td>SELF 16: I know the CDC’s recommendations for protocol after an occupational exposure to HIV</td>
<td>217</td>
<td>2</td>
<td>5</td>
<td>4.37</td>
<td>.710</td>
</tr>
<tr>
<td>SELF 17: I can effectively provide dental hygiene care to persons with HIV disease</td>
<td>217</td>
<td>2</td>
<td>5</td>
<td>4.51</td>
<td>.624</td>
</tr>
</tbody>
</table>

Descriptive statistics were generated for the four items that measured the extent of dental hygienists’ perceived risk in treating patients with HIV/AIDS. Results are shown in Table 4.4.

Table 4.4

*Dental Hygienists’ Perceived Risk in Treating HIV/AIDS Patients (RISK Scale)*

<table>
<thead>
<tr>
<th>Item Number / Item</th>
<th>N</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISK 18: I feel worried about the possibility of acquiring HIV/AIDS from patients</td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>2.17</td>
<td>1.155</td>
</tr>
<tr>
<td>RISK 19: I worry about possible casual contact with a person with HIV/AIDS</td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>1.49</td>
<td>.759</td>
</tr>
<tr>
<td>RISK 20: I feel that dental hygienists need to know the HIV antibody status of patients they are caring for</td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>3.56</td>
<td>1.260</td>
</tr>
<tr>
<td>RISK 21: I worry that the infection control procedures used in our office will not protect me from acquiring HIV/AIDS on the job</td>
<td>214</td>
<td>1</td>
<td>5</td>
<td>1.61</td>
<td>.766</td>
</tr>
</tbody>
</table>
Descriptive statistics were generated for the seven items that measured dental hygienists’ behavioral beliefs and attitudes toward treating HIV/AIDS patients. Results are shown in Table 4.5.

Table 4.5

<table>
<thead>
<tr>
<th>Item Number / Item</th>
<th>N</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT 22: I would be putting myself at risk if I treated HIV/AIDS patients</td>
<td>217</td>
<td>1</td>
<td>5</td>
<td>2.14</td>
<td>1.190</td>
</tr>
<tr>
<td>ATT 23: I would be putting other patients at risk if I work with HIV/AIDS patients</td>
<td>217</td>
<td>1</td>
<td>5</td>
<td>1.73</td>
<td>0.899</td>
</tr>
<tr>
<td>ATT 24: I would be putting my family at risk if I work with HIV/AIDS patients</td>
<td>215</td>
<td>1</td>
<td>5</td>
<td>1.79</td>
<td>0.951</td>
</tr>
<tr>
<td>ATT 27: I would hurt my future job prospects if I work with HIV/AIDS patients</td>
<td>217</td>
<td>2</td>
<td>5</td>
<td>1.58</td>
<td>0.779</td>
</tr>
<tr>
<td>ATT 29: I would prefer not to treat homosexual patients because I am concerned about getting HIV and developing AIDS</td>
<td>217</td>
<td>1</td>
<td>5</td>
<td>1.41</td>
<td>0.675</td>
</tr>
<tr>
<td>ATT 30*: I would shake hands with someone who has HIV/AIDS</td>
<td>212</td>
<td>1</td>
<td>5</td>
<td>1.44</td>
<td>0.815</td>
</tr>
<tr>
<td>ATT 34: I feel that I am at risk of contracting HIV due to personal lifestyle practices</td>
<td>217</td>
<td>1</td>
<td>5</td>
<td>1.24</td>
<td>0.627</td>
</tr>
</tbody>
</table>

* reverse coded item

Descriptive statistics were generated for the six items that measured dental hygienists’ normative beliefs toward treating HIV/AIDS patients. Results are shown in Table 4.6.
Table 4.6

*Table 4.6: Dental Hygienists’ Normative Beliefs toward Treating HIV/AIDS Patients (NORM Scale)*

<table>
<thead>
<tr>
<th>Item Number / Item</th>
<th>N</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORM 25:</td>
<td></td>
<td>217</td>
<td>1</td>
<td>5</td>
<td>1.85</td>
</tr>
<tr>
<td>The attitude of my family affects my decision to work with HIV/AIDS patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORM 26:</td>
<td></td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>1.63</td>
</tr>
<tr>
<td>The attitude of my friends affects my decision to work with HIV/AIDS patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORM 28*:</td>
<td></td>
<td>214</td>
<td>1</td>
<td>5</td>
<td>2.15</td>
</tr>
<tr>
<td>My boss thinks that I should provide dental hygiene care for any person who has HIV/AIDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORM 31:</td>
<td></td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>2.42</td>
</tr>
<tr>
<td>People with HIV/AIDS should not be allowed to work as dentists or dental hygienists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORM 32:</td>
<td></td>
<td>216</td>
<td>1</td>
<td>5</td>
<td>2.18</td>
</tr>
<tr>
<td>Dental hygienists should be allowed to refuse to provide care to persons with HIV/AIDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORM 33:</td>
<td></td>
<td>213</td>
<td>1</td>
<td>5</td>
<td>2.55</td>
</tr>
<tr>
<td>My co-workers do not want to treat HIV/AIDS patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* reverse coded item</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Research Question 2: What is the association between dental hygienists’ intentions to treat and perceived self-efficacy, perceived risk of being infected, normative beliefs, and attitudes toward treating HIV/AIDS patients?

Thirty-four variables were split into five summative rating scales and were used to test the constructs of interest pertinent to the Theory of Reasoned Action. These constructs were: behavioral beliefs, normative beliefs, attitude toward the behavior, subjective norm, and behavioral intention. Five new summative scale variables were computed: Intention scale, Self-Efficacy scale, Risk scale, Attitude scale and Normative Beliefs scale. Table 4.7 shows the number of dental hygienists who answered all of the items for each scale, the minimum and maximum range of scores, the mean and standard deviation of the summative scale scores, and the Cronbach’s alpha coefficient for each of the summative scales. The selection of items included in computing the scale scores was based on internal consistency analysis of the sets of items used to measure each construct.
(Cronbach’s alpha ≥ .60). As shown, the Cronbach’s alpha coefficients were moderate to high for all five scales.

Table 4.7

Univariate Analysis of Five Constructs Used to Assess Dental Hygienists’ Future Intentions to Treat HIV/AIDS Patients

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Sample Mean</th>
<th>Std. Deviation</th>
<th>Cronbach’s Alpha Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention (INT) Scale Score</td>
<td>208</td>
<td>13</td>
<td>35</td>
<td>31.26</td>
<td>4.15</td>
<td>.926</td>
</tr>
<tr>
<td>Self Efficacy (SELF) Scale Score</td>
<td>208</td>
<td>21</td>
<td>50</td>
<td>40.88</td>
<td>5.23</td>
<td>.855</td>
</tr>
<tr>
<td>Risk of Occupational Transmission (RISK) Scale Score</td>
<td>214</td>
<td>4</td>
<td>20</td>
<td>8.80</td>
<td>2.78</td>
<td>.629</td>
</tr>
<tr>
<td>Attitude (ATT) Scale Score</td>
<td>210</td>
<td>7</td>
<td>27</td>
<td>11.34</td>
<td>4.05</td>
<td>.788</td>
</tr>
<tr>
<td>Normative Beliefs (NORM) Scale Score</td>
<td>210</td>
<td>6</td>
<td>30</td>
<td>12.75</td>
<td>3.85</td>
<td>.661</td>
</tr>
</tbody>
</table>

Descriptive statistics were computed for the five scale variables and revealed that the Intention Scale showed a significant amount of skewness and kurtosis. When the numerical value for skewness (-1.030) was compared with twice the Standard Error of Skewness (.169 * 2 = ±.338), it was concluded that the distribution was significantly negatively skewed. The same numerical process was used to determine whether the kurtosis was significantly non-normal. The Standard Error of Kurtosis was multiplied by 2 (.336 * 2 = ±.672) to calculate the normal range for kurtosis. The numerical value for kurtosis was 1.258, and it was concluded that the distribution was significantly kurtotic. However, if a distribution is determined to be markedly skewed, there is no need to examine kurtosis because the distribution is not normal (Munro, 2005). A histogram revealed a bimodal distribution for this scale variable.

Next, Spearman rank-order correlation tests were conducted on the Intention scale (dependent variable) and the four other construct scales. Correlational tests were used to study the strength and direction of relationships between pairs of variables, and range in
value from +1 to -1, where 0 means that there is no relationship between the variables (McDermott, & Sarvela, 1999). Results revealed several statistically significant positive and negative correlations (see Table 4.8).

Table 4.8

*Intention Scale Scores by Other Scale Scores*

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>N</th>
<th>Approximate Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT Scale * SELF Scale</td>
<td>.495</td>
<td>201</td>
<td>.000</td>
</tr>
<tr>
<td>INT Scale * RISK Scale</td>
<td>-.381</td>
<td>206</td>
<td>.000</td>
</tr>
<tr>
<td>INT Scale * ATT Scale</td>
<td>-.621</td>
<td>201</td>
<td>.000</td>
</tr>
<tr>
<td>INT Scale * NORM Scale</td>
<td>-.615</td>
<td>201</td>
<td>.000</td>
</tr>
</tbody>
</table>

Research Question 3: Is there an association between years in practice and intention to treat HIV/AIDS patients?

A Spearman rank-order correlation test was carried out to determine if an association existed between the demographic variable, “years in practice” and the Intention Scale score. Because “years in practice” constituted an interval level variable, and the Intention scale represented ordinal data, the Spearman rank-order correlation statistic was used. Results revealed no statistically significant correlation between these two variables (Table 4.9).

Table 4.9

*Association between Intention Scale Score and Dental Hygienists’ Years in Practice*

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>N</th>
<th>Approximate Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT Scale * Years in Practice</td>
<td>-.014</td>
<td>202</td>
<td>.841</td>
</tr>
</tbody>
</table>
**Research Question 4:** Is there an association between having ever treated an HIV+ patient as a student, and future intention to treat HIV/AIDS patients?

A Kruskal-Wallis H test was used to determine if the nominal variable, “ever treated as a student” was associated with the Intention Scale score. The Kruskal-Wallis H test is the non-parametric analog of the one-way analysis of variance, and was used because it compared two or more groups, and because the INT Scale score violated the assumption underlying the parametric test for normal distribution. Table 4.10 shows that there was no significant correlation between these two variables.

Table 4.10

*Correlation of Intention Scale Scores with History of Having Treated HIV/AIDS Patients as a Student*

<table>
<thead>
<tr>
<th>Did you treat HIV/AIDS patients as a dental hygiene student?</th>
<th>N</th>
<th>Mean Rank</th>
<th>Chi Square</th>
<th>Degrees of Freedom</th>
<th>Asymptotic Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT Scale Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>57</td>
<td>91.11</td>
<td>4.277</td>
<td>2</td>
<td>.118</td>
</tr>
<tr>
<td>Yes</td>
<td>51</td>
<td>111.64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't Know</td>
<td>100</td>
<td>108.49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>208</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A decision was made to transform the independent variable into two categories where the “No” and “Don’t Know” groups were combined. Further analysis of the “Yes” and “No” groups using the Mann Whitney U test confirmed that there was no significant correlation between the two groups, as is seen in Table 4.11.
Recoded Variable: Correlation of Intention Scale Scores with History of Having Treated HIV/AIDS Patients as a Student

<table>
<thead>
<tr>
<th>Did you treat HIV/AIDS patients as a dental hygiene student?</th>
<th>INT Scale Score</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymptotic Statistical Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>157</td>
<td>102.18</td>
<td>16042.50</td>
<td>3639.500</td>
<td>.312</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51</td>
<td>111.64</td>
<td>5693.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>208</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Research Question 5: Is there an association between “ever treated an HIV+ patient in private practice” and intention to treat HIV/AIDS patients?

A Kruskal-Wallis H test determined if the nominal level variable, “ever treated in private practice,” was associated with future intentions to treat HIV/AIDS patients. The Kruskal-Wallis H test is the non-parametric analog of the one-way analysis of variance, and was used because it compared two or more groups, and because the INT Scale score violated the assumption underlying the parametric test for normal distribution. Table 4.12 shows that there was a statistically significant association between these two variables.

<table>
<thead>
<tr>
<th>Have you treated HIV/AIDS patients in private practice?</th>
<th>INT Scale Score</th>
<th>N</th>
<th>Mean Rank</th>
<th>Chi Square</th>
<th>Degrees of Freedom</th>
<th>Asymptotic Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>8</td>
<td>63.88</td>
<td>15.234</td>
<td>2</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>166</td>
<td>112.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't Know</td>
<td>34</td>
<td>75.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>208</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

131
The three response options enabled three possible pairs to be examined. Further analysis of the three pairwise comparisons (yes / no; yes / don’t know; no / don’t know) using the Mann-Whitney U test revealed one statistically significant association (yes / don’t know; \( p<0.001 \)) after making the Bonferroni adjustment for multiple comparisons resulting in a more conservative statistical significance criterion (.05 / 3 \( \rightarrow \) \( p =.017 \)). Because three pairwise comparisons were made, there was a chance of making a Type I error, and that is why the Bonferroni adjustment was made. The new level of significance was now .017 instead of .05. Results in Table 4.13 show the relevant values.

After testing the pairwise comparisons, this variable remained statistically significant (\( p<.001 \)). Because only 8 respondents reported not having treated HIV/AIDS patients in private practice, a decision was made to transform the variable by collapsing two categories, “no” and “don’t know” into a single “no” category. Thus, the recoded

<table>
<thead>
<tr>
<th>Have you treated HIV/AIDS patients in private practice?</th>
<th>INT Scale Score</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymptotic Statistical Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>INT Scale Score</td>
<td>8</td>
<td>48.38</td>
<td>387.00</td>
<td>351.000</td>
<td>.018</td>
</tr>
<tr>
<td>Yes</td>
<td>INT Scale Score</td>
<td>166</td>
<td>89.39</td>
<td>14838.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>INT Scale Score</td>
<td>174</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>INT Scale Score</td>
<td>166</td>
<td>106.44</td>
<td>17669.50</td>
<td>1835.500</td>
<td>.001*</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>INT Scale Score</td>
<td>34</td>
<td>71.49</td>
<td>2430.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>INT Scale Score</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>INT Scale Score</td>
<td>8</td>
<td>20.00</td>
<td>160.00</td>
<td>124.000</td>
<td>.698</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>INT Scale Score</td>
<td>34</td>
<td>21.85</td>
<td>743.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>INT Scale Score</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
* p<.017

variable had two response options, “yes” and “no.” A Mann-Whitney U test was conducted to determine if the variable transformation had any effect. Results showed that there was a significant difference between those who have, and those who have not treated patients in private practice, and their intention to treat HIV/AIDS patients (p<0.000). Results are shown in Table 4.14.

Table 4.14

<table>
<thead>
<tr>
<th>Have you treated HIV/AIDS patients in private practice?</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymptotic Statistical Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT Scale Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>42</td>
<td>73.56</td>
<td>3089.50</td>
<td>2186.500</td>
<td>.000</td>
</tr>
<tr>
<td>Yes</td>
<td>166</td>
<td>112.33</td>
<td>18646.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>208</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

An odds ratio is the probability of something occurring over the probability of it not occurring. However, an odds ratio (OR) and confidence intervals could not be computed because 24 (70.6%) of the cells had counts <5. The minimum expected count is 20. If an odds ratio could have been computed, it would have told us the probability of the number of dental hygienists who intended to treat HIV/AIDS patients, versus the probability of the number of dental hygienists who intended not to treat HIV/AIDS patients.

Research Question 6: Is there an association between dental hygienists’ knowing a friend or family member with HIV/AIDS, and intention to treat HIV/AIDS patients?
A Mann-Whitney U test determined if the nominal variable, “knowing a friend or family member with HIV/AIDS,” was associated with intention to treat HIV/AIDS patients. The non-parametric Mann-Whitney U test was used to compare the two groups, and is analogous to the parametric t-test. Table 4.15 found no statistically significant association between the mean ranks of the two groups ($p = .083$).

<table>
<thead>
<tr>
<th>INT Scale Score</th>
<th>Do you have a friend or family member who has HIV/AIDS?</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymptotic Statistical Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>170</td>
<td>101.20</td>
<td>17203.50</td>
<td>2668.500</td>
<td>.083</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>38</td>
<td>119.28</td>
<td>4532.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>208</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Research Question 7:* What is the measure of association between dental hygienists’ intentions to treat, perceived self-efficacy, perceived risk of being infected, and attitudes and normative beliefs about treating HIV/AIDS patients?

In this study, two initial steps in regression diagnostics were conducted to check for outliers and to determine that the chosen variables were normally distributed. Then, bivariate relationships were checked for linearity, and scatterplots and histograms were used to visualize these relationships. The findings led the researcher to change the type of regression analysis that was planned for research question 7. Initially, a multiple linear regression was planned to analyze the data. However, the bimodal, skewed distribution of the dependent variable changed that plan, and a binomial (binary) logistic regression was
conducted instead. Based on the output from the univariate analyses of their intention score, two fairly evenly distributed groups of dental hygienists were formed with respect to their predicted action, in this case, dental hygienists’ higher intention to treat or lesser intention to treat HIV/AIDS patients. Logistic regression determines which variables affect the probability of a particular outcome.

Block 1

Based on results of bivariate analyses, five predictor variables were entered into the logistic regression using the Enter method to obtain the best fitting model for the data. The five predictor variables included Self-Efficacy scale, Risk scale, Attitude scale, Normative Beliefs scale, and one variable from the practice context. For the six variables (one dependent and five independents), 188 of 217 cases had valid values for this model (N= 188). The model is summarized in Table 4.16.

Omnibus tests revealed that this model was significant for all predictor variables ($\chi^2 (5, N=188) = 71.781, p = .000$). The statistically significant Chi-square value meant that there was more chance of obtaining a significant model than if there was no effect of the independent variables on the dependent variable. In other words, if the independent variables did not affect the dependent variable, then nothing would be significant.

How do we know if the data fit the model? Logistic regression applies maximum likelihood estimation to approximate the probability of a certain event occurring. A good model results in a high likelihood of the observed results, and means a small value of -2 Log likelihood (-2 LL). The log likelihood (LL) is its log and varies from 0 to minus infinity (it is negative because the log of any number less than 1 is negative). If the model fit perfectly, the -2 LL would equal 0. The -2 LL was 188.757. The
nonsignificant Hosmer and Lemeshow goodness of fit test result (p = .714) indicated that the data fit the model. The classification table showed that 80% of the time, the independent variables correctly predicted intention of dental hygienists to treat HIV/AIDS patients, when all five of the independent variables are in the model.

The $\beta$ coefficient (standardized slope) represents the change in the logit of the dependent variable per unit change in the corresponding predictor variable. The Wald statistic tests the significance of the individual logistic regression coefficients for each independent variable. Therefore, a significant value of the Wald statistic ($p < .05$ and $p < .01$) indicates that the $\beta$ coefficient for each independent variable is significantly different from zero in the model. In this model, two predictors, Self-Efficacy scale ($\beta = .145, p = .001$), and Normative Beliefs scale ($\beta = -.214, p = .003$) made significant contributions toward predicting the outcome.

The logistic regression identified Self-Efficacy scale as the strongest predictor of intention. The odds ratio in the model indicates the change in odds per unit change in each predictor variable. An odds ratio of 1.157 indicated that for each point scored on the Self-Efficacy scale, dental hygienists were 1.157 times more likely to have intent to treat HIV/AIDS patients. As dental hygienists’ self-efficacy increased, the odds increased by 16% for participants being in the high intention group.

The predictor variable, Normative Beliefs scale, was found to be the second strongest predictor of dental hygienists’ intention to treat HIV/AIDS patients. The odds ratio of .808 means that the odds of being in the high intention group decreased by 20% with each point added to the Normative Beliefs scale. In other words, the dental
hygienists with higher normative scale scores are 20% less likely to be in the high intention group and to have intent to treat HIV/AIDS patients.

Multicollinearity was assessed by reviewing the correlation matrix. Correlation coefficients < .60 indicated that collinearity did not exist among the predictor variables in the model. VIF values were well under 10 (average = 1.730), and tolerance values were well above .10 indicating there was no collinearity in the model.

Table 4.16

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELF_Total</td>
<td>.145</td>
<td>.043</td>
<td>11.430</td>
<td>1</td>
<td>.001</td>
<td>1.157</td>
</tr>
<tr>
<td>RISK_Total</td>
<td>-.026</td>
<td>.083</td>
<td>.100</td>
<td>1</td>
<td>.751</td>
<td>.974</td>
</tr>
<tr>
<td>ATT_Total</td>
<td>-.087</td>
<td>.069</td>
<td>1.615</td>
<td>1</td>
<td>.204</td>
<td>.916</td>
</tr>
<tr>
<td>NORM_Total</td>
<td>-.214</td>
<td>.071</td>
<td>9.078</td>
<td>1</td>
<td>.003</td>
<td>.808</td>
</tr>
<tr>
<td>TRT_PTS_IN_PRIV_PRAC</td>
<td>.255</td>
<td>.464</td>
<td>.301</td>
<td>1</td>
<td>.583</td>
<td>1.290</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.282</td>
<td>2.242</td>
<td>1.037</td>
<td>1</td>
<td>.309</td>
<td>.102</td>
</tr>
</tbody>
</table>

Variable(s) entered on step 1: SELF_Total, RISK_Total, ATT_Total, NORM_Total, TRT_PTS_IN_PRIV_PRAC.

Block 2

The researcher examined the standardized residuals and deleted 4 cases that were considered to be outliers (N = 184). A second logistic regression analysis was run, however, removing the cases did not change the significance of the findings.

Table 4.17 summarizes the logistic regression analyses and includes the confidence intervals that identify the boundaries within which 95% of samples measuring the same variables as this study would fall (*p<.05)
Table 4.17

Summary of Logistic Regression Analyses Predicting Dental Hygienists’ Intentions to Treat HIV/AIDS Patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>P value</th>
<th>95% C.I. for Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELF_Total</td>
<td>1.157</td>
<td>.001*</td>
<td>1.063</td>
</tr>
<tr>
<td>RISK_Total</td>
<td>.974</td>
<td>.751</td>
<td>.827</td>
</tr>
<tr>
<td>ATT_Total</td>
<td>.916</td>
<td>.204</td>
<td>.801</td>
</tr>
<tr>
<td>NORM_Total</td>
<td>.808</td>
<td>.003*</td>
<td>.703</td>
</tr>
<tr>
<td>TRT_PTS_IN_PRIV_PRAC</td>
<td>1.290</td>
<td>.583</td>
<td>.520</td>
</tr>
</tbody>
</table>

Regression Summary

The model was assessed by examining test results of the logistic regression analyses, statistical significance of predictor variables in the model, and results of the -2LL and Hosmer and Lemeshow goodness-of-fit tests.

A binary logistic regression was the correct statistical test for this type of data because the dependent variable violated the assumption of normality. Using this model, it was not necessary to meet the stringent assumptions as is the case when running a multiple regression analysis. In summary, it is always important to choose the correct model for analysis, otherwise the results may be invalid, and any future studies may show different results.
Chapter V

Discussion, Conclusions and Recommendations

Chapter V presents a discussion of the research and conclusions drawn from the results obtained from the survey. This study examined beliefs, attitudes and intentions of dental hygienists in Florida who were members of the FDHA to investigate the relationships between a host of independent variables and dental hygienists’ intentions to treat HIV/AIDS patients. This study was based on the TRA, a decision model that incorporates the effects of personal and social factors on behavior, and used a non-experimental, cross sectional research design to analyze these relationships. In addition, the study design permitted the examination of the strength and direction of the relationships among these variables that may serve as the basis for future studies, development of oral health education curricula for DHCPs, and policy development.

This type of study is important, because the epidemic is 26 years old, and recently, dental hygienists in 13 states still reported feeling a risk of occupational transmission of HIV (King & Muzzin, 2005). Other studies cited in the literature review revealed more than two decades of unchanged attitudes and practices associated with treating patients with infectious diseases. Unchanged attitudes and practices of DHCPs may stem from their fear of contracting a disease that can alter or shorten life. Their perceptions may also contribute to the clinical practice choices made by clinicians.
The researcher thought that similar findings would be able to be reported here, but the respondents did not express most of the same attitudes and practices that were described in previous studies dating back to the early 1980s. A discussion of the findings follows.

Discussion of Results

This section provides a summary of the results used to address each of the seven research questions in this study.

Research Question 1: What are dental hygienists’ stated intentions, attitudes, perceived risk, perceived self-efficacy and normative beliefs toward treating HIV/AIDS patients?

The mean scores of each of the seven intention items (INT 1-7) indicated positive agreement of dental hygienists with respect to their willingness to treat HIV/AIDS, Hepatitis B, and Hepatitis C patients.

The ten self-efficacy items (SELF 8-17) also had high mean scores that indicated belief in their clinical abilities to treat HIV/AIDS patients. While the use of standard (universal) precautions achieved the highest mean score, all respondents stated that they used these mandated precautions in their workplace settings. The high scores indicated that the study participants were confident in their ability to treat HIV/AIDS patients.

Four items (RISK 18-21) measured the risk of treating HIV+ patients. The low means of three items (RISK 18, 19, and 21) indicated that dental hygienists did not worry about acquiring HIV from infected patients or from inadequate infection control practices in the workplace, nor did they worry about casual contact with people who are HIV+ or those who have AIDS. In contrast however, dental hygienists felt that they needed to know the HIV antibody status of their patients (RISK 20), which may mean that they
really do feel at risk when treating HIV/AIDS patients. The literature supports this finding among dental hygienists, especially the recent study by King & Muzzin (2005). The concurrence of findings means that it is more fact than myth. Because standard precautions have been mandated for infection control purposes, there is no reason to know this information. This finding contradicts their unilateral response of using universal (standard) precautions in the workplace, which may be social response bias.

Seven items (ATT 22-24, 27, 29, 30, 34) measured attitude toward treating HIV/AIDS patients, and showed that respondents thought they would not be putting themselves, patients, or others at risk if they treated HIV/AIDS patients. Their positive attitudes toward treating HIV/AIDS patients were consistent across all attitude items.

Two normative belief items (NORM 25-26) revealed that the respondents did not allow the attitudes of others to affect their choice of clinically treating HIV/AIDS patients. When dental hygienists move from “not allowing others to affect their decisions” to “allowing them to affect their decisions,” their intention to treat HIV/AIDS patients decreases. One item (NORM 28) measured the normative beliefs of dental hygienists’ perceptions of the expectations of their boss for them treating HIV/AIDS patients. The fact that dental hygienists agreed with the statement: “My boss thinks that I should provide dental hygiene care for any person who has HIV/AIDS,” indicates that they perceive that their employers feel positively toward them treating HIV/AIDS patients, and is consistent with Florida BOD supervision requirements. Study participants disagreed that 1) dentists or dental hygienists who have HIV/AIDS should not be allowed to work in the dental field (NORM 31); 2) they should be allowed to refuse to provide care to persons with HIV/AIDS (NORM 32), and 3) their co-workers
did not want to treat HIV/AIDS patients (NORM 33). This meant that the direction of their response was positive, and overall, their normative beliefs did not hinder their intention to treat HIV/AIDS patients.

Research Question 2: What is the association between dental hygienists’ intentions to treat and perceived self-efficacy, perceived risk of being infected, attitudes and normative beliefs toward treating HIV/AIDS patients?

Bivariate analysis of the dependent variable scale and the four independent variable scales was conducted. Results showed that all four scales were strongly correlated with the dependent variable ($p < .001$). This set of correlations means that:

1. respondents who reported that they were capable of treating HIV/AIDS patients in a clinical setting, also had positive intentions to do so;
2. as their perception of the risk of occupational transmission decreased, dental hygienists’ intention to treat HIV/AIDS patients increased;
3. as participants’ negative attitudes and normative beliefs decreased, their intentions toward treating HIV/AIDS patients increased.

Bivariate analysis also was conducted for the intention scale and the eleven demographic variables. Only one statistically significant association was found between the INT scale and having treated patients in private practice (see Research Question 5). The remaining ten demographic variables showed no measure of association with the dependent variable. This result means that dental hygienists who have clinically treated HIV/AIDS patients in private practice have a positive intention to do so.

Research Question 3: Is there an association between years in practice, and intention to treat HIV/AIDS patients?
The results of a Spearman rank-order correlation test showed that there was no statistically significant association between the number of years in practice, and the participants’ intention to treat HIV/AIDS patients. In fact, the Spearman rank-order correlation value suggested that the more years that dental hygienists practiced, there was slightly less intention to treat HIV/AIDS patients.

Research Question 4: Is there an association between ever treated an HIV+ patient as a student, and intention to treat HIV/AIDS patients?

A Kruskal-Wallis H test was conducted to investigate whether a dental hygienist who had treated an HIV+ patient as a student has an intention to treat HIV/AIDS patients. The test results were not significant at this level of analysis, and meant that there was no significant difference among the three groups of study participants (yes, no, don’t know).

Although a significant difference did not exist among the three groups, the researcher recoded the data into two groups (yes, no (no + don’t know)). Further analysis using a Mann-Whitney U test revealed that there still was no significant difference between the groups. This result means that the respondents did not base their decision to treat HIV/AIDS patients on whether they had or had not treated persons with HIV/AIDS as students.

Research Question 5: Is there an association between ever treated an HIV+ patient in private practice, and intention to treat HIV/AIDS patients?

Similar to research question 4, a Kruskal-Wallis H test was conducted to investigate whether a dental hygienist who had treated an HIV+ patient in private practice may have an intention to treat HIV/AIDS patients. This association was statistically significant, and further analyses of three pairwise comparisons using a Mann Whitney U
test revealed one significant association. After transformation to a nominal variable was completed, results showed that there was a significant difference between those who have, and those who have not treated patients in private practice, and their intention to treat HIV/AIDS patients \((p<0.000)\). This result meant that dental hygienists who had treated HIV/AIDS patients in private practice had greater intention to do so, whereas those respondents who had not treated HIV/AIDS patients in private practice had a lesser intention to do so.

*Research Question 6:* Is there an association between knowing a friend or family member with HIV/AIDS, and intention to treat HIV/AIDS patients?

A Mann-Whitney U test was conducted to evaluate whether knowing a friend or family member with HIV/AIDS was related to their intention to treat HIV/AIDS patients. The results were not statistically significant. The lack of association between the two variables means that the respondents’ intentions to treat HIV/AIDS patients did not depend on knowing a friend or family member with HIV/AIDS.

*Research Question 7:* What is the measure of association between dental hygienists’ intentions to treat, perceived self-efficacy, perceived risk of being infected, and attitudes and normative beliefs about treating HIV/AIDS patients?

A logistic regression was conducted with six variables (one dependent, and five independent) that were chosen as a result of previous univariate and bivariate analyses. The first model (Block 1) found that the Self-Efficacy and Normative Belief scales were significantly associated with the Intention scale. This association meant that as dental hygienists’ self-efficacy increased, the odds for them being in the high intention group increased also. However, dental hygienists who had higher normative belief scale scores
were less likely to be in the high intention group, because they allowed other people’s beliefs to influence their behavior. Next, four outliers were excluded from the analysis, and a second model (Block 2) was computed. This second model did not change the significance of the findings.

**Recommendations**

The researcher has identified three recommendations as a result of this study.

**Recommendation 1: Mandate Florida Board of Dentistry CE requirements every two years for dentists and dental hygienists in the area of HIV/AIDS.**

Eighty percent (80.2%) of the respondents in this study reported they had treated HIV/AIDS patients in private practice. This large proportion did not include the 16% of practitioners who reported that they did not know if they had treated HIV+ patients. Because the majority of dental hygienists in this study reported having treated this population, and because the nature of the disease and treatment options keep changing, there is a need to continue to mandate continuing education requirements in Florida. Another imperative reason to continue this process is that Florida has one of the largest HIV/AIDS populations in the nation.

Re-licensure of dental professionals in Florida occurs every two years. Prior to 2006, dentists and dental hygienists were required to attend at least one hour of HIV/AIDS update training every other year. The 2006 legislation only mandates it once for dentists/dental hygienists before they renew their license for the first time. In 2003, the CDC recommended: “Personnel subject to occupational exposure should receive infection control training when they begin their job, when new tasks or procedures affect their occupational exposure, and at the least, on an annual basis ((MMWR report (52, RR-
Based on findings in this study, 63% of dental hygienists felt that they needed to know the HIV antibody status of their patients, which contradicted their unilateral response (100%) of using universal (standard) precautions in the workplace, and may mean that they really do feel at risk when treating HIV/AIDS patients. Because standard precautions have been mandated for infection control purposes, there is no reason to know this information.

Based on the 2005 study of dental hygienists in 13 states, the dearth of knowledge exhibited about HIV transmission confirmed the need for continuing education on infectious disease and modes of transmission. This study did not obtain information about respondents’ knowledge of HIV transmission.

Recommendation 2: Incorporate cultural/sensitivity training in all dental/dental hygiene school curriculums.

HIV/AIDS is not just a medical issue. From a policy perspective, it is also a political and social issue. The stigma and discrimination surrounding HIV/AIDS has made it different from how people view other sexually transmitted diseases, tuberculosis, or even cancer. When it was first reported in 1981, the resurgence of right wing fundamentalist principles of personal responsibility, sin, and sexual deviation had made a comeback among the American populace and was tacitly supported or at least condoned by government administrations. The sexual, cultural and social factors of the 1980s made the treatment of this disease different than if it had manifested itself in the 1940s, 1950s, or 1960s when it most probably would have been treated differently. But the fact that HIV/AIDS was first discovered in the gay population exacerbated a conservative and moralistic movement that disenfranchised groups such as homosexuals and lesbians
because of the link to sexual transmission over other forms of disease transmission. One outcome of this thinking has been the funding of abstinence-only sex education, and refusal at some official policy levels to acknowledge other avenues of disease prevention.

The polar opposite of that was the extreme left wing that adopted political and social correctness as its agenda. The individualistic agenda allowed people to become more litigious and to think of themselves as victims. The social creed of the left wing was the idea of “victimology” which meant that people were not responsible for their actions, and that they were victims of the system. Political and social forces were working against each other, and affected government policy and funding of HIV/AIDS. It also affected how American society viewed this disease with stigma and discrimination.

A UCLA study on HIV stigma revealed that one in four people living with HIV felt stigmatized by their health care provider (Kinsler, Wong, Sayles, Davis, & Cunningham, 2007). Kinsler, et al, (2007) showed that approximately one-fourth of respondents reported perceived stigma at baseline, and one-fifth reported these same findings at follow-up. These findings are of particular importance, because lack of access or delayed access to care may result in patients presenting with more advanced stages of disease, and the likelihood of earlier mortality. Therefore, interventions are needed to reduce perceived stigma in the health care setting. Educational programs and role-playing (modeling) of non-stigmatizing behavior can teach health care providers to provide unbiased care. In addition, a toolkit was developed to raise awareness and promote action to challenge and reduce HIV stigma among different target groups that included health care professionals: *Understanding and Challenging HIV Stigma: Toolkit*
The first three objectives of the toolkit are specific to health care providers and include: 1) build ownership of the problem and help everyone see that HIV stigma exists and really hurts, and that we can be a part of reducing stigma; 2) deepen understanding on HIV/AIDS to help people deal with their fears in the workplace, and misconceptions about what happens when someone becomes infected, and 3) provide a safe place for people to discuss their fears, values and attitudes towards persons living with HIV and/or AIDS (PLHA) and take ownership of a new set of values. Even with the growth of a global philosophy, many Americans including health care providers lack culturally appropriate skills. Although sensitivity training around HIV is available to health care workers, currently there is no universal requirement for medical or dental professionals to undergo such training.

**Recommendation 3: Increase access to oral health care for persons with HIV/AIDS by legislating to eliminate barriers to practice.**

On July 20, 2006, Pennsylvania Governor Ed Rendell signed into law the first of a series of bills in his comprehensive plan to provide greater access to high quality care to all Pennsylvanians at affordable costs. The building block in the Governor’s health reform plan was to utilize the professional health care workforce in the state more fully. The bills signed into law expanded access to health care providers by eliminating barriers to practice to the fullest extent permitted by the provider’s scope of practice, and by expanding the scope of practice in certain cases. This legislation is important because it represents the first state to make explicit workforce changes as a solution to improving access at affordable costs. The general rule states that it allows Certified Registered Nurse Practitioners, Clinical Nurse Specialists, Physician Assistants, Nurse Midwives,
and Independent Dental Hygienist Practitioners to take medical histories, perform physical or mental examinations, and to provide acute illness or minor injury care or management of chronic illness in the same manner as physicians and dentists, as long as those activities fall within their specialty certification and scope of practice. The Independent Dental Hygienist Practitioner is established as an identified provider who can perform the functions of a dental hygienist at specified sites without the supervision of a dentist. This enactment in Pennsylvania makes 22 states that currently have less restrictive practice options for dental hygienists. Kansas allows dental hygienists who have a passion for taking care of the underserved to obtain an “Extended Care Permit” (ECP) to take care of persons who have no access to a dentist or any type of dental care (F. Catalanotto, personal communication, July 29, 2007).

In 2007, the South Carolina Board of Dentistry (SCBOD) settled charges that it restrained competition in the provision of preventive care by dental hygienists. The Federal Trade Commission (FTC) alleged that this conduct limited needy children’s access to care (Appendix G). The FTC announced on June 27, 2007 that a consent order had settled charges brought in September 2003 that the SCBOD unlawfully restrained competition in violation of Section 5 of the FTC Act when it adopted a rule that required a dentist to examine every child before a dental hygienist could provide preventive care in schools. The problem was that the SCBOD adopted the rule in 2001 after the South Carolina legislature had eliminated a statutory requirement that a dentist was required to examine each child before a dental hygienist could perform the preventive dental care in schools. The FTC alleged that the SCBOD’s anticompetitive conduct led to fewer children, especially the economically disadvantaged, receiving preventive dental services
in schools. This case set a new precedent and told state regulatory boards that if they restricted competition in ways not contemplated by state law, they would be subject to the antitrust laws of the FTC’s Bureau of Competition (Byrd, T., 2007, June 26).

On February 19, 2008, Florida’s Governor Charlie Crist, released his top three priorities of the 2008 Legislative Session: 1) health care; 2) education, and 3) energy and economic development. Within the area of health care, Governor Crist specifically noted access to dental care, and has included the following points in proposed legislation:

- Enhance the recruitment of dentists to work in public health settings;
- Maximize the services hygienists may provide in public health settings; similar to the FTC’s charges against the SCBOD noted above;
- Require that two of seven Board of Dentistry member dentists have public health experience;
- Permit Medicaid to pay doctors and nurses to provide fluoride varnish services for children birth to age three during Well Child visits;
- Expand community dental services in rural areas for persons with disabilities, and
- Increase Medicaid reimbursement to dentists by 20%.

The Florida BOD intends to challenge the Governor’s legislation. Two bills were introduced by the FDHA during the opening of the 2008 Florida legislative session to challenge the Florida dentists’ position of disallowing a change in supervisory requirements for dental hygienists that could ultimately make a difference in improving access to care for patients. In addition, the FDHA is fighting the Florida BOD on its decision to allow dental assistants to perform some clinical duties of dental hygienists.
that puts Floridians at risk for possible patient safety violations, because there are no mandatory education requirements for dental assistants as they may be trained on-the-job. Currently, Oklahoma dental hygienists are fighting a battle to allow dental assistants to perform dental hygienists’ duties in a preceptorship (on-the-job) mode.

**Strengths of the Study**

*The study is substantive.* The study has added to the body of dental and public health literature. The topic of HIV/AIDS and intention to treat HIV+ patients within dental workplace settings has not been researched in the state of Florida, and only has been marginally researched nationally and internationally. This study showed that dental hygienists who are members of the FDHA have an intention to treat HIV/AIDS patients. The next step would be to survey the entire population of Florida dental hygienists on this and other topics related to HIV/AIDS.

*This study validates methodologies used.* The survey instrument was validated through several methods: 1) face validity and content validity processes; 2) live pilot session of using the instrument; 3) pilot session testing instrument reliability; 4) email survey validated by data received from USF IT Dept.

*The study is relevant.* Access to dental care for low income, underserved, and unserved populations continues to be a major concern to public health professionals in Florida. This study focuses on dental hygienists and their intention to treat the HIV/AIDS population in Florida. The HIV/AIDS population has had little access to dental care due to the dearth of dental professionals who have been willing to treat them. While 80% of respondents reported treating HIV/AIDS patients, it was assumed that either these patients had dental insurance, and / or they were able to pay for services. A
large number of newly diagnosed individuals with HIV/AIDS are young minority women who have little access to dental care, because they are on Medicaid or cannot pay themselves. Governor Crist’s statistics show that 52% of Florida counties currently have one Medicaid dentist, while the remaining counties have none, and thereby supports the issue of lack of access to dental care in Florida for specific populations such as those with HIV/AIDS.

*The study is timely.* As a result of Florida Governor Crist’s legislative priorities, dental public health will be expanded to treat low income and persons in poverty. The outcome of legislating these priorities will increase access to and availability of dental health services. Reducing the impact of the Florida BOD rulings will allow DHCPs to work in an expanded public health sector and provide services to the populations that really need them, and that are mostly not made available by private sector providers.

*Weaknesses of the Study*

*Small sample; Inability to generalize findings.* Although a 22% response rate was achieved, the actual number of useable surveys (217) was small even though the total number of FDHA members were contacted and asked to participate. Whereas the response rate was adequate to answer the research questions posed, participation was contingent on dental hygienists’ receiving and reviewing the email and mailed postcard messages, and having a computer and sufficient knowledge of the Internet to access and respond to the survey. The researcher originally wanted to survey all Florida dental hygienists. Because it was not possible to obtain email addresses from the state BOD, the FDHA was willing to provide them to the researcher. Dental hygienists who are members of FDHA may differ from non-member dental hygienists in Florida in terms of
their beliefs, attitudes, intentions and clinical practices. Therefore, the results of this study cannot be generalized to non-FDHA members, or to other dental hygienists nationally or internationally.

Email addresses on file and data collection lessons learned. Whereas approximately 60% of respondents had an email address on file with FDHA, 115 members were found to have non-useable email addresses, therefore, approximately 500 members received the survey information via email. The remainder of respondents received postcards in the mail that informed them of the web address to link them with the survey. No postcards were returned stating they could not be delivered, so it was assumed that they reached the intended recipients. The first lesson learned was to be aware that people change email addresses, and use spam blockers. The researcher must over sample to account for this difference, however, it was impossible to over sample in this study, because the entire FDHA membership was surveyed.

On July 17, 2007, after the first mailing, it was determined that the survey link on the postcard was missing one letter. Postcards were reprinted and were re-mailed immediately, announcing the error. The lesson here is to always check the accuracy of the link prior to printing, because the re-mailing may be confusing to respondents, and the added expense may be unnecessary.

Implications for Public Health

This study adds to both public health and dental health literature in the areas of access to care, infectious disease, willingness to treat, normative beliefs, attitudes, self-efficacy, and perceived risk of disease transmission.
Although HIV/AIDS has become known as a chronic disease, it is still recognized first as an acute infectious disease (Scandlyn, 2000). With the large number of HIV/AIDS cases in Florida, knowing how to treat this population is imperative. In addition to clinical training, public health education and cultural sensitivity training may help to increase knowledge and to reduce stigma among dental health care providers. Changing this perception is paramount to reducing the fear about HIV/AIDS that has not been eliminated to date. The provision of training of health professionals in cultural and sensitivity issues will allow DHCPs to serve patients more effectively by eliminating this barrier. The World Health Organization (WHO) has recognized the impact of HIV/AIDS worldwide and declared December 1st as annual World AIDS Day to promote awareness, encourage discussion, and mobilize action in the quest toward achieving parity among the HIV-infected and non-infected populations.

Results from this study provide additional evidence for decreasing supervision requirements of dental hygienists in Florida, thereby increasing access to dental care services for the underserved populations such as the HIV-infected, the elderly, school-age children, the mentally challenged and the disabled. Reducing the supervisory requirements would allow dental hygienists to provide the same care they currently provide in dental offices in public health settings, which may improve the health care status of these populations overall. This expansion of service venues may directly relate to reduced mortality and morbidity among these populations.

Implications for Future Research

The results of this study implore investigating both licensed dentists and dental hygienists in Florida to compare group differences, and then to evaluate the differences
between those who do belong or do not belong to their professional associations. 
Because of the subservient relationship of dental hygienists to dentists in Florida who are 
governed by the Board of Dentistry, group differences would be especially important to 
note at this point in time. Analyzing the group data by membership status in professional 
organizations would further substantiate this study, and the development of oral health 
education curricula for DHCPs. Examining the strength and direction of the relationships 
among these variables could serve as the basis for later studies. 

For example, the difference between ADHA (American Dental Hygienists’ 
Association) members and non-members was reported in a study by King and Muzzin 
(2005) who found that membership in a professional organization may have impacted the 
attitudes and practices of subjects through exposure to current research in disease 
transmission. ADHA members were less likely to alter practices when treating infectious 
disease patients. The findings suggest that having greater access to research publications 
and continuing education programs through local, state and national associations may 
make members more knowledgeable about infectious disease transmission, thus 
creasing the likelihood of feeling a need to alter clinical practices. Therefore, 
*education is vital* in effecting change in the attitudes and practices of dental hygienists 
when treating patients with infectious or “unknown” diseases. Better education links 
directly with the first two recommendations. 

Future research comparing pre-and-post access to dental care for low income, 
underserved, and unserved populations in Florida is warranted should Governor Crist’s 
legislation be passed. Results may show a significant change in access to health care, 
especially dental health care, for these currently unrecognized populations. In addition,
research into the change in health status of these different populations would be reasonable.

Afterthoughts

In the mid-1990s and ten years after the first CDC infectious disease guidelines were written, Silverman (1996) wrote:

There is no end in sight for the HIV/AIDS pandemic. Therefore, with or without knowledge of their own serologic status, HIV-infected patients will be seeking dental care in increasing numbers in the decade ahead. Additionally, the diagnosis and management of frequently occurring HIV-associated oral lesions will add to dental responsibilities. By following infectious disease guidelines for blood-borne pathogens, dental clinicians, office workers and patients will have an extremely low risk for HIV transmission (p.53).

Dental professionals, either knowingly or unknowingly, will be treating HIV+ patients for years to come, and the general practitioner will likely continue to carry the main burden (Silverman, 1996). Beliefs and attitudes held by clinicians as well as patients are the basis for concern regarding HIV transmission risks and office procedures. The differences in attitude among clinicians and office staff have created stresses that have dictated office culture, atmosphere and functions. The sensitivity of patients and staff members has been an important issue in office functions. Critical considerations influencing judgments have been based on the deadliness of the HIV virus, emotional attitudes and misconceptions, legal and political implications, family pressures, economic factors, understanding, knowledge and compassion. More than anything now, we must
put down these judgments and face the future with optimism and strength that paves the way toward improved oral health status for those who are HIV-infected.

**Personals**

During data collection, I received an email from a dental hygienist who was soon relocating back to Haiti:

I am impressed that you are conducting this research and using this survey to assist with treatment for those that need it, no matter what their health status; as they need it the most! I remember when this disease was first "discovered and named" and the 'stigma' that followed. I have compassion for all-those infected and those in our profession that choose not to treat. May there be more of us that do choose to provide dental hygiene services. Good luck on furthering your education and assisting those that need our services (K. Barton, personal communication, July 12, 2007; see Appendix I).
List of References


Burris, S. (1994). Law and ethics and the decision to treat. In M. Glick (Ed.), *Dental management of patients with HIV* (pp. 25-40). Carol Streams, IL: Quintessence Publishing Co., Inc.


Centers for Disease Control. (1986). *Recommended infection-control practices for dentistry*.


Centers for Disease Control. (1992). *Update: investigations of patients who have been treated by HIV-infected health-care workers*.

Centers for Disease Control. (1993a). *Investigations of patients who have been treated by HIV-infected health-care workers -- United States*.


*Journal of the California Dental Association* 46, 45-50.


The AIDS Institute. (2002, November 1). *Progress reported on curbing disparities.*


Appendix A: Permissions
Clark-Alexander, Barbara

From: Tami Miller [tami@fdha.org]
Sent: Sunday, January 02, 2005 10:27 AM
To: Clark-Alexander, Barbara
Subject: RE: Follow-up
Follow Up Flag: Follow up
Flag Status: Flagged

Barbara,

Great! What is your estimated date for needing them so I can mark my calendar. Thanks Tami

At 11:36 AM 12/31/04, you wrote:

Tami,

Thank you so much for working with me on this!
Yes, we do have that capability, and I agree. I will be working with our Information Services (IS) Dept. at the Health Sciences Center to have them program this single email application.
I will be in touch with you as far as how to send the email addresses to me, or to the IS Dept. closer to the time when I am ready to send out the survey.
Happy New Year Tami, and thank you again. I am one happy camper :) 

Barbara

-----Original Message-----
From: Tami Miller [mailto:tami@fdha.org]
Sent: Thursday, December 23, 2004 9:25 AM
To: Clark-Alexander, Barbara
Subject: Re: Follow-up

Hi Barbara,

Yes, I got permission from the president to allow you to use the emails that we have on file for our members. However, there is one request that the emails are sent individually so everyone does not have everyones email address. Do you have that capability? Tami

At 04:34 PM 12/22/04, you wrote:

Tami,

I have not heard back from you regarding the use of email addresses to poll FDHA members for my dissertation online survey. Have you received permission for me to do this? Please advise, and have a happy holiday season!
Barbara Clark-Alexander

Tami Miller, RDH, BS
FDHA Executive Director
PO Box 30938
Palm Beach Gardens, FL 33420
(850) 866-0503 phone
(866) 866-0504 fax
tami@fdha.org

10/21/2005
Barb – the following are the faculty who have expressed an interest/willingness to serve as an expert panel.

Chris Blue  blues005@umn.edu
Me  newel001@umn.edu
Stephanie Russell  russed013@umn.edu
Sarah Verville  verri001@umn.edu
Jeanne Anderson  ande006@umn.edu
Kandi Garland  garl0014@umn.edu
Joy Osborn  osborn001@umn.edu
Carmen Rea1  rea10007@umn.edu
Michelle Sessa  sensa003@umn.edu
Jackie Tinberg  tinbg0001@umn.edu

Let me know if any problems reaching these people.

Good luck.

Kathy
Message

Clark-Alexander, Barbara

From: Solovan-Gleason, Donna [dsolevangleeson@hcoff.edu]
Sent: Tuesday, October 25, 2005 7:46 AM
To: Clark-Alexander, Barbara
Subject: RE: My Dissertation

Yes......there are 21 students in my program at the current time.....let me know how you wish to proceed.

-----Original Message-----
From: Clark-Alexander, Barbara [mailto:bclark@hsc.usf.edu]
Sent: Friday, October 21, 2005 1:22 PM
To: Solovan-Gleason, Donna
Subject: My Dissertation
Importance: High

Donna,

It was good to see you last month at the HCC nubilion seminar. After the seminar, we discussed the possibility of using the HCC dental hygiene students to help me pilot the survey questionnaire. I have been working on writing my dissertation and assembling my questionnaire to actually survey members of the FDHA who have email addresses about their attitudes and intentions to treat HIV/AIDS patients.

May I pilot the questionnaire with your dental hygiene students? How many students are in your 2-year program? I will be ready to do this in approximately 2 weeks, and am asking for a formal consent from you. Please let me know, and thanks in advance for your time.

Barbara Clark-Alexander

10/25/2005
You're most welcome!!! deb

At 02: 10 PM 9/30/2005, you wrote:

Thank you so much Dr. Preston, for allowing me to adapt your NAAS instrument, and I am very impressed with your new stigma instrument as well. I have the first two articles which you listed, and will get the third one. Thanks again for your help and for your kind words.
Barbara Clark-Alexander

-----Original Message-----
From: Deborah Preston [mailto:dgp@psu.edu] Sent: Friday, September 30,2005 12:24 PM To: Clark-Alexander, Barbara
Subject: Re: NMS Scale

Dear Barbara

I am sorry for the delay in responding to your request - I have been out of the country. But thank you for your interest in the NAAS. I would think that it could be adapted to dental hygienists. You have my permission to use and adapt the NAAS to your needs. I have not used it for awhile because I have been developing measures of stigma related to IIIV and homosexuality.

So I am attaching both just in case you might find our current work useful as well. I can also refer you to three articles we have written that might be useful:


Appendix A (Continued)
All the best in your doctoral work and let me know if there is anything else I can do.

Sincerely

Deb Preston

At 11:14 AM 8/12/2005, you wrote:

Dr. Preston,
I am a graduate student at the University of South Florida, Tampa, FL, and am currently writing my dissertation. My dissertation topic is looking at attitudes, intentions and behaviors of dental hygienists in treating HIV/AIDS patients. I am in process of trying to find an instrument that would be acceptable for my study.
I am interested in the NAAS (Nurses’ Attitudes about AIDS Scale) the you were involved in developing and analyzing.
Would you be willing to share the NAAS with me? Or would you be able to point me in the right direction toward an instrument that I could use? I am having difficulty locating one.
Thank you for your time Dr. Preston, and I look forward to hearing from you.
Barbara Clark-Alexander, RDH, BS, MPH, Doctoral Candidate

Deborah Bray Preston
3296 Shellers Bend, # 144
State College, PA 16801
814-861-4332 dqp@psu.edu
http://www.personal.psu.edu/dqp/

**************************************************************************
The HSC AntiVirus Server has scanned this email and attachment(s) for email was found not to be infected. As always, please insure that th software on your local machine is kept up to date.
**************************************************************************

Deborah Bray Preston, PhD
Professor Emerita of Nursing Penn State School of Nursing
205E Health and Human Development
East University Park, PA 16802
814-861-4332
dqp@psu.edu
http://www.personal.psu.edu/dqp/
From: Katherine Woods [Woods.Katherine@spcollege.edu]
Sent: Friday, October 21, 2005 11:00 PM
To: Tami Grzesikowski; Clark-Alexander, Barbara
Cc: LindaK Johnson; Christine Patel; Marta De La Torre; Maryellen Tilly
Subject: RE: My Dissertation

How about if we have the sophomores do this on a Friday during lunch time (if they want to)? Katie

From: Tami Grzesikowski
sent: Fri 10/21/2005 2:14 PM
To: Clark-Alexander, Barbara
Cc: LindaK Johnson; Katherine Woods; Christine Patel; Marta De La Torre; Maryellen Tilly
Subject: RE: My Dissertation

I certainly don't mind but I don't teach them in the classroom. If I can find a willing faculty to assist you by distributing it we would gladly help out.

I will copy them and let you know.

Congratulations on your accomplishments thus far,

Tam;

TamiGrzesikows,RDH MEd
Dean, School of Dental Hygiene
st. Petersburg College

From: Clark-Alexander, Barbara [mailto:bclark@hsc.usf.edu]
sent: Friday, October 21, 2005 1:16 PM
To: Tami Grzesikowski
Subject: My Dissertation
Importance: High

Tami,
I have been working on writing my dissertation and assembling my questionnaire to survey members of the FDHA who have email addresses about their attitudes and intentions to treat HIV/AIDS patients. May I pilot the questionnaire using your dental hygiene students (not the bachelor degree students since they may be members of FDHA)? How many students are in your 2-year program? I will be ready to do this in approximately 2 weeks. We can arrange the logistics if you consent to this. Please let me know, and thanks in advance for your time.
Barbara Clark-Alexander
From: Tami Miller [tami@fdha.org]
Sent: Tuesday, November 14, 2006 11:05 AM
To: Clark-Alexander, Barbara
Subject: Re: Dissertation Plan B

From Tami Miller, FDHA

Hi Barbara,

It nice to finally meet you as well. I can provide member labels, but cannot filter out those with emails. Can you share the survey with me and what kind of questions that you will be asking?? If so, I might be able to waive the fee for the labels. Tarni

Clark-Alexander, Barbara wrote:

> Hi Tami,
> > I was great to finally meet you at the dental hygiene conference.
> > You did such a super job planning it! Although I was there only one > day, I really learned a lot from the 3 sessions that I attended. I
> > thought it was super cool that your Morn was there helping. It is nice > to still have a Morn.
> > > I presented my proposal to my doctoral committee on Oct. 20th.
> > > The backup plan was suggested and developed because there are not > enough potential subjects with email addresses to give me significant > results, if any should be realized. A larger sample is necessary.
> > > Therefore, the backup plan includes sending postcards with my URL to > members who do not have an email address. This method is better than > mailing surveys to them multiple times, because it allows all the data > to corne into our IT/IS Dept., reduces potential error with data entry > (if mailed surveys were used), and is much less costly and intrusive.
> > > My plan is to run the e-mailings, and postal mailings simultaneously. > A total of 4 postal mailings will occur at the same time as when I email the group with email addresses. I would like to know if you would consider giving me mailing labels for the hygienists who do not have email addresses? I will pay for the labels, as I need 4 sets. The goal is to get the postcards printed in Nov. and afix labels and stamps in Dec., as my advisor has set Jan. 15th as the target date to begin my survey.
> > You asked me to write a brief introduction > do that. It will be emailed around Jan. 12th. call me (813-974-6641-work; 813-334-5305-cell) > questions. Thank you Tami.
> > Barbara Clark-Alexander
> >

P.S. I am working with Debbie Heysek at Hillsborough Community College where I conducted Phase 2 of the pilot study. Katie Woods from St. Pete College is letting me work with her 2nd year students to check reliability. I am scheduling that now.
Hi Barbara,
I will mail to you today: 4 mailing label sets of members with no emails and a hard copy of members with emails. I've also attached this list to this email. There are 613 members with emails (371 without). I need the words that you want on the email blast from ADHA at your earliest convenience. Make it from you as a member requesting assistance from other members. Tami

Clark-Alexander, Barbara wrote:
Tami,
This is perfect for the email blast. Could you check on the status of the mailing labels, and permission for me to make 3 more sets? The postcards are mailed four times as reminders to those without email addresses to log into the survey. The clock begins running with the ADHA blast, and will continue for one month so I will need them soon. Thank you so much Tami! Barbara

> -----Original Message-----
> From: Tami Miller [mailto:tami@fdha.org]
> Sent: Tuesday, May 08, 2007 12:11 PM
> To: Clark-Alexander, Barbara
> Subject: Re: Quick Response Requested from FDHA
>
> Barbara,
> ADHA will email the pre survey memo/letter saying that the survey will be coming. If anyone has a question your information can be listed for any responses (I don't want to field questions about the survey). I am going out of town on Friday and will not be back in the office until Thursday, May 17th. I just talked to ADHA and let them know we would request the email blast next week upon my return. Tami
Appendix B: Expert Panel Survey
In this section, you are asked to indicate your willingness to provide dental care to groups of patients. Please indicate how much you agree or disagree with each statement by putting the appropriate number from the rating scale on the line next to the statement. If you would like to comment on any statement, please use the space at the end of the questionnaire. Please respond to each statement using the following scale:

<table>
<thead>
<tr>
<th>PART I</th>
<th>Is this item content appropriate to one of the objectives?</th>
<th>Is the wording clear?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1. I would be willing to provide dental care for a patient with cerebral palsy who has periodontal disease.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I would be willing to provide dental care for a patient who was post myocardial infarction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I would be willing to provide dental care for a person with HIV/AIDS.</td>
<td></td>
<td></td>
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<tr>
<td>4. I would be willing to provide dental care for a patient with severe mental retardation.</td>
<td></td>
<td></td>
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<tr>
<td>5. I would be willing to provide dental care for a wheelchair-bound patient.</td>
<td></td>
<td></td>
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<tr>
<td>6. I would be willing to provide dental care for a patient with a post prosthetic heart valve replacement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I would be willing to provide dental care for a patient with post massive right brain, cerebral vascular infarct.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I would be willing to provide dental care for a patient with diabetes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I would be willing to provide dental care for a patient of record with HIV/AIDS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I would be willing to provide dental care for a new patient with HIV/AIDS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I would be willing to provide dental care if a patient told me they were bisexual.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I would be interested in an opportunity to work with patients with HIV/AIDS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I would not take care of any patients with mental retardation if given a choice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I would not take care of any patients with Hepatitis B if given a choice.</td>
<td></td>
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<tr>
<td>15. I would not take care of any patient with Hepatitis C if given a choice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I would not take care of any patient with HIV/AIDS if given a choice.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

193
Appendix B (Continued)

This section focuses only on HIV disease. Please indicate how much you agree or disagree with the following statements.

<table>
<thead>
<tr>
<th>PART II</th>
<th>Is this item content appropriate to one of the objectives?</th>
<th>Is the wording clear?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes  No No, modify as:</td>
<td>Yes  No No, modify as:</td>
</tr>
<tr>
<td>1.</td>
<td>I can identify oral lesions associated with HIV disease.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I know the treatments for common HIV-related oral lesions.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I know community resources for people with HIV disease.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>I can obtain a thorough HIV-risk factor history.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>I can provide HIV risk-reduction counseling.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>I use universal precautions.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>I can educate patients about HIV disease (e.g. transmission, HIV antibody testing, infection control protocol).</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>I can safely provide dental care to persons with HIV disease.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>I know the CDC’s recommendations for protocol after an occupational exposure to HIV.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>I can effectively provide dental care to persons with HIV disease.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Perceived Clinical Ability Scale from J. Driscoll dissertation.
A professional issue and concern related to managing infectious diseases like HIV is the risk of occupational transmission of the virus via various treatment procedures or activities. Please indicate your concern associated with each of the following items.

<table>
<thead>
<tr>
<th>PART III</th>
<th>Is this item content appropriate to one of the objectives?</th>
<th>Is the wording clear?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1. I feel worried about the possibility of acquiring HIV/AIDS from patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I worry about possible casual contact with a person with HIV/AIDS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I am fearful of caring for persons with HIV/AIDS because there is no cure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Dental hygienists need to know the HIV antibody status of patients they are caring for.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. It is comforting to know that there isn’t much difference in caring for HIV/AIDS patients than caring for other terminally ill persons.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I am bothered that I might not be able to prevent myself from contracting HIV/AIDS.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: NAAS (Nurses AIDS Attitude Scale), Nursing Care Concerns section.
Appendix B (Continued)

Please indicate how much you agree or disagree with the following statements by putting the appropriate number from the following rating scale on the line next to each statement.

<table>
<thead>
<tr>
<th>PART IV</th>
<th>Is this item <em>content appropriate</em> to one of the objectives?</th>
<th>Is the <em>wording clear</em>?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes  No  No, modify as:</td>
<td>Yes  No  No, modify as:</td>
</tr>
<tr>
<td>1.L I would put myself at risk if I work with HIV/AIDS patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.L I would put patients at risk if I work with HIV/AIDS patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.L I would put my family at risk if I work with HIV/AIDS patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.L I would be shunned by my family if I work with HIV/AIDS patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.L I would be shunned by my friends if I work with HIV/AIDS patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.L I would be shunned by my co-workers if I work with HIV/AIDS patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.L I would hurt relations with my partner if I work with HIV/AIDS patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.L I would hurt my future job prospects if I work with HIV/AIDS patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.L Generally speaking, I usually do what my spouse/partner expects me to do.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.L Generally speaking, I usually do what my family expects me to do.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.L Generally speaking, I usually do what my close friends expect me to do.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.L Generally speaking, I usually do what my co-workers expect me to do.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.L Most people who are important to me think I should care for any person who is HIV+ to whom I am assigned.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.L Most members of my family think that I should care for any person who has HIV/AIDS to whom I am assigned.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.L My close friends think that I should care for any person who has HIV/AIDS to whom I am assigned.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.L My coworkers think that I should care for any person who has HIV/AIDS to whom I am assigned.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PART IV CONTINUED</td>
<td>Is this item content appropriate to one of the objectives?</td>
<td>Is the wording clear?</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>17.L</td>
<td>My spouse/partner thinks that I should care for any person who has HIV/AIDS to whom I am assigned.</td>
<td></td>
</tr>
<tr>
<td>18.L</td>
<td>My boss thinks that I should care for any person who has HIV/AIDS to whom I am assigned.</td>
<td></td>
</tr>
<tr>
<td>19.^</td>
<td>I would not treat homosexuals because I am concerned about getting HIV and developing AIDS.</td>
<td></td>
</tr>
<tr>
<td>20.^</td>
<td>Patients would leave the practice I work in if they knew I treat patients with HIV/AIDS.</td>
<td></td>
</tr>
<tr>
<td>21.^</td>
<td>Dentists are ethically obligated to treat patients at risk for HIV/AIDS.</td>
<td></td>
</tr>
<tr>
<td>22.*</td>
<td>I would continue to visit and support a friend who had HIV/AIDS.</td>
<td></td>
</tr>
<tr>
<td>23.*</td>
<td>I would shake hands with someone who has HIV/AIDS.</td>
<td></td>
</tr>
<tr>
<td>24.*</td>
<td>HIV/AIDS patients should not be discriminated against in any way.</td>
<td></td>
</tr>
<tr>
<td>25.*</td>
<td>I would not form a friendship with someone if I knew they had HIV/AIDS.</td>
<td></td>
</tr>
<tr>
<td>26.*</td>
<td>People with HIV/AIDS should not be allowed to work as dentists or dental hygienists.</td>
<td></td>
</tr>
<tr>
<td>27.n</td>
<td>I am distressed that dental procedures have changed because of HIV/AIDS.</td>
<td></td>
</tr>
<tr>
<td>28.n</td>
<td>Dental hygienists should be allowed to refuse care to persons with HIV/AIDS.</td>
<td></td>
</tr>
<tr>
<td>29.m</td>
<td>Dental hygienists are ethically obligated to treat patients at risk for HIV/AIDS.</td>
<td></td>
</tr>
<tr>
<td>30.m</td>
<td>My co-workers do not want to treat HIV/AIDS patients.</td>
<td></td>
</tr>
</tbody>
</table>

Finally, this last section requests demographic information which helps to clarify and enhance the precious information that you provided. Please answer “practice” questions using your primary employer.

Your Age: __________

Your Gender: M ___ F ___

Marital Status: ___ 1. Single
___ 2. Married
___ 3. Separated / Divorced
___ 4. Living with partner or significant other
___ 5. Widowed / Widower

Years of Education: ___ 1. High school + dental hygiene school
___ 2. 4 year college degree (BA / BS)
___ 3. Post college

Year graduated from dental hygiene school ________

Currently practicing: ___ Y ___ N ___ Full-time ___ Part-time ___ Salaried ___ Independent Contractor

# Years Practicing: _______

Practice Setting Location: ___ Urban ___ Suburban ___ Rural

Did you treat HIV/AIDS patients as a dental hygiene student? Y ___ N ___

Have you treated HIV/AIDS patients in private practice? Y ___ N ___ If ‘Yes’, how many? ______

Do you know someone who is HIV+ or who has AIDS? Y ___ N ___
Appendix C: Timeline, FDHA Blast, Mail and Email Templates
# TIMELINE FOR SURVEY IMPLEMENTATION

**JANUARY 15 – FEBRUARY 23**

Contacts / E-mailing and Mailing Dates

<table>
<thead>
<tr>
<th>7/9</th>
<th>7/12</th>
<th>7/26</th>
<th>8/15</th>
<th>8/31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Notice E-mail</td>
<td>Thank You / Reminder E-mails and Postcards with survey link</td>
<td>Data Collection Closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-mail Intro Letter with survey link; Mail postcards with survey link</td>
<td>Final Contact Thank You / Reminder E-mails and Postcards with survey link</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FDHA EMAIL BLAST:

Hi, I am Barbara Clark-Alexander, a dental hygiene colleague, and in the next two days, I will be sending you a short online survey as part of my dissertation requirements. Please fill out the survey to help us all learn more about Florida dental hygienists’ feelings toward current treatment issues. Study results will be posted on the FDHA listserv. You may reach me at: bclark@hsc.usf.edu; 813-974-6641. Thanks for your cooperation, and attention to this matter.
Mail Templates by Date Mailed

1st template mailed on July 11, 2007:

_I am asking for your assistance_ because you are an FDHA member. Recently, FDHA sent you an email blast informing you about a dental hygiene survey. If you have already filled it out, I would like to thank you for participating. If you haven't, won't you take a few minutes to provide us with this very important information?

_D copy the link below to your browser to begin the survey:

Remember to hit "Submit" at the end.
Study results will be posted on the FDHA listserve.
You may reach me at: bclark@hsc.usf.edu; 813-974-6641.
Thanks again.

2nd template mailed on July 24, 2007:

I am Barbara Clark-Alexander, a colleague, and I need your help. I am surveying Florida dental hygienists thoughts toward current treatment issues, and am looking forward to hearing what you have to say. Thank you in advance if you completed and returned the email survey that was sent to you recently. If not,

_D copy the link below to your browser to begin the survey:

Thank you for taking the 5-10 minutes to do this for me.
You may reach me at: bclark@hsc.usf.edu; 813-974-6641.

3rd template mailed on August 13, 2007:

_F final Reminder
HELLO! This is Barbara Clark-Alexander, an FDHA colleague, asking you one last time to fill out the online dental hygiene Survey by:

_D copying the link below to your browser to begin the survey:
you have completed it, click "Submit" at the end.
The online survey will be available until August 31, 2007.
Thanks very much if you have already replied as I am most appreciative.
You may reach me at: bclark@hsc.usf.edu; 813-974-6641.
Appendix C (Continued)

Email Templates by Date Sent

1st email sent on July 12, 2007:
I am asking for your assistance because you are an FDHA member. Recently, FDHA sent you an email blast informing you about a dental hygiene survey. If you have already filled it out, I would like to thank you for participating. If you haven't, won't you take a few minutes to provide us with this very important information?
Copy the link below to your browser to begin the survey:
Remember to hit "Submit" at the end.
Study results will be posted on the FDHA listserv.
You may reach me at: bclark@hsc.usf.edu; 813-974-6641.
Thanks again.

2nd email sent on July 26, 2007:
I am Barbara Clark-Alexander, a colleague, and I need your help. I am surveying Florida dental hygienists thoughts toward current treatment issues, and am looking forward to hearing what you have to say. Thank you in advance if you completed and returned the email survey that was sent to you recently. If not,
Copy the link below to your browser to begin the survey:
Thank you for taking the 5-10 minutes to do this for me.
You may reach me at: bclark@hsc.usf.edu; 813-974-6641.

3rd email sent on August 15, 2007:
Final Reminder
HELLO! This is Barbara Clark-Alexander, an FDHA colleague, asking you one last time to fill out the online dental hygiene Survey by:
Copying the link below to your browser to begin the survey:
http://hsccm2.hsc.usf.edu/us3/Surveys/TakeSurvey.aspx?surveyid=1225 When you have completed it, click "Submit" at the end.
The online survey will be available until August 31, 2007.
Thanks very much if you have already replied as I am most appreciative.
You may reach me at: bclark@hsc.usf.edu; 813-974-6641.
ERROR IN EMAIL LINK CHANGED:

I am asking for your assistance because you are an FDHA member. Recently, FDHA sent you an email blast informing you about a dental hygiene survey. If you have already filled it out, I would like to thank you for participating. If you haven’t, won’t you take a few minutes to provide us with this very important information?

Please copy the link below to your browser to begin the online survey:
Remember to hit “Submit” at the end.
Study results will be posted on the FDHA listserv.
You may reach me at: bdark@hsc.usf.edu, 813-974-6641.
Thanks again.
Appendix D: Letter of Consent / Survey
Dear Dental Hygiene Colleagues,

I am Barbara Clark-Alexander, RDH, BS, MPH, and I am working on a PhD degree in Community and Family Health Studies at the University of South Florida under the direction of Robert J. McDermott, Ph.D. This survey is part of the research for my dissertation in which I am investigating precautions and risks related to infectious disease issues. As a dental hygienist who is a member of the Florida Dental Hygienists' Association, I am writing to ask for your help.

This research study explores beliefs, attitudes and intentions of dental hygienists to treat selected groups of patients with infectious diseases, and examines the relationships between intentions and other variables that may impact their intentions to treat these patients. Your participation is voluntary. You are not required to sign an informed consent form as your participation provides such consent, and no health, financial, professional, or employment risks to you are posed.

Your completed survey responses will be received by the Information Services Department of USF Health. Only my research committee of five faculty members and I will be permitted to see these responses. Be assured that your responses are confidential and all identifiers related to you will be removed prior to data analysis. Moreover, only aggregate statistics will be generated. The findings will benefit the practice of dental hygiene in caring for patients with infectious disease. Results will be shared with participants through the Florida Dental Hygienists' Association listserv at the conclusion of the study. The findings also will be submitted for publication consideration in the Journal of the American Dental Hygienists' Association, American Journal of Public Health, Florida Public Health Review, Access, and the Florida Dental Association Journal.

The more responses I receive, the more reliable the research will be. Therefore, I ask that you please take 10 minutes to complete this brief online questionnaire (see link below). In the event that you are employed in more than one dental practice, please respond to the following questions with what you consider your primary practice in mind.

If you have any questions, feel free to contact me at (813) 974-6641 or email me at bclark@health.usf.edu. Again, thank you for your participation. I appreciate your assistance in helping to understand important factors that impact dental hygiene practice.
Appendix D (Continued)

PART I
In this section, you are asked to indicate your willingness to provide dental hygiene care to groups of patients. Please indicate how much you agree or disagree with each statement by putting the appropriate number from the rating scale on the line next to the statement. If you would like to comment on any statement, please use the space at the end of the questionnaire. Please respond to each statement using the following scale:

1. Strongly Agree
2. Agree
3. Neither Agree nor Disagree / Uncertain
4. Disagree
5. Strongly Disagree

___ 1. I would be willing to provide dental hygiene care for a person with HIV/AIDS.
___ 2. I would be willing to provide dental hygiene care for a patient of record with HIV/AIDS.
___ 3. I would be willing to provide dental hygiene care for a new patient with HIV/AIDS.
___ 4. I would be willing to provide dental hygiene care if a patient told me he/she was bisexual.
___ 5. I would be interested in an opportunity to treat patients with HIV/AIDS in my current work setting.
___ 6. I would take care of any patient with Hepatitis B.
___ 7. I would take care of any patient with Hepatitis C.

PART II
This section focuses only on HIV disease. Please indicate how much you agree or disagree with the following statements.

1. Strongly Agree
2. Agree
3. Neither Agree nor Disagree / Uncertain
4. Disagree
5. Strongly Disagree

___ 1. I can identify oral lesions associated with HIV disease.
___ 2. I know the treatments for common HIV-related oral lesions.
___ 3. I know community resources for people with HIV disease.
___ 4. I can obtain a thorough medical history including HIV risk factors.
___ 5. I can provide HIV risk-reduction counseling.
___ 6. I use universal precautions.
Appendix D (Continued)

___ 7. I feel professionally prepared to educate patients about HIV disease (e.g. transmission, HIV antibody testing, infection control protocol).
___ 8. I can safely provide dental hygiene care to persons with HIV disease.
___ 9. I know the CDC’s recommendations for protocol after an occupational exposure to HIV.
___ 10. I can effectively provide dental hygiene care to persons with HIV disease.

PART III
A professional issue and concern related to managing infectious diseases like HIV is the risk of occupational transmission of the virus via various treatment procedures or activities. Please indicate your concern associated with each of the following items.

1. Strongly Agree
2. Agree
3. Uncertain
4. Disagree
5. Strongly Disagree

___ 1. I feel worried about the possibility of acquiring HIV/AIDS from patients.
___ 2. I worry about possible casual contact with a person with HIV/AIDS.
___ 3. I feel that dental hygienists need to know the HIV antibody status of patients they are caring for.
___ 4. I worry that the infection control procedures used in our office will not protect me from acquiring HIV/AIDS on the job.

PART IV
Please indicate how much you agree or disagree with the following statements by putting the appropriate number from the following rating scale on the line next to each statement.

1. Strongly Agree
2. Agree
3. Uncertain
4. Disagree
5. Strongly Disagree

___ 1. I would be putting myself at risk if I treated HIV/AIDS patients.
___ 2. I would be putting other patients at risk if I work with HIV/AIDS patients.
___ 3. I would be putting my family at risk if I work with HIV/AIDS patients.
___ 4. The attitude of my family affects my decision to work with HIV/AIDS patients.
___ 5. The attitude of my friends affects my decision to work with HIV/AIDS patients.

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Appendix D (Continued)

6. I would hurt my future job prospects if I work with HIV/AIDS patients.
7. My boss thinks that I should provide dental hygiene care for any person who has HIV/AIDS.
8. I would prefer not to treat homosexual patients because I am concerned about getting HIV and developing AIDS.
9. I would shake hands with someone who has HIV/AIDS.
10. People with HIV/AIDS should not be allowed to work as dentists or dental hygienists.
11. Dental hygienists should be allowed to refuse to provide dental hygiene care to persons with HIV/AIDS.
13. I feel that I am at risk of contracting HIV due to personal lifestyle practices.

PART V
Demographics

Finally, this last section requests demographic information which helps to clarify and enhance the precious information that you provided. Please answer “practice” questions using your primary employer.

Your Age: __________
Your Gender: M ___ F ___

Marital Status: (check one)
   ___ 1. Single
   ___ 2. Married
   ___ 3. Separated / Divorced
   ___ 4. Living with partner or significant other
   ___ 5. Widowed / Widower

Race: (check one)
   ___ 1. White (Caucasian)
   ___ 2. Black / African American (not Hispanic)
   ___ 3. Hispanic / Latino (Black or White)
   ___ 4. Asian
   ___ 5. Native Hawaiian / Other Pacific Islander
   ___ 6. American Indian / Alaskan Native
   ___ 7. More than one race
   ___ 8. Unknown

Education: (check highest achieved)
   ___ 1. Dental Hygiene Diploma
   ___ 2. Associate Degree (e.g. AA, AS)
   ___ 3. Bachelor Degree (e.g. BA, BS)
   ___ 4. Post Baccalaureate Degree (e.g. Masters or higher degree)
Appendix D (Continued)

Year graduated from dental hygiene program ________

Years in Practice ________

Currently practicing: ___ Full-time ___ Part-time ___ Not Practicing

Did you treat HIV/AIDS patients as a dental hygiene student? ___ Y ___ N

Have you treated HIV/AIDS patients in private practice? ___ Y ___ N

Do you have a friend or family member who has HIV/AIDS? ___ Y ___
Appendix E: IRB
January 17, 2007

Barbara Clark-Alexander, MPH and Robert McDermott, PhD
Community and Family Health
MDC56

RE: Exempt Certification for IRB#: 104464G
Title: Dental Hygienists’ Beliefs, Norms, Attitudes and Intentions Toward Treating HIV/AIDS Patients

Dear Ms. Clark-Alexander and Dr. McDermott:

On January 12, 2007, the Institutional Review Board (IRB) determined that your research meets USF requirements and Federal Exemption criteria two (2). It is your responsibility to ensure that this research is conducted in a manner reported in your application and consistent with the ethical principles outlined in the Belmont Report and with USF IRB policies and procedures.

Please note that changes to this protocol may disqualify it from exempt status. It is your responsibility to notify the IRB prior to implementing any changes.

The Division of Research Integrity and Compliance will hold your exemption application for a period of five years from the date of this letter or for three years after a Final Progress Report is received. If you wish to continue this protocol beyond those periods, you will need to submit an Exemption Certification Request form at least 30 days before this exempt certification ends. If a Final Progress Report has not been received, the IRB will send you a reminder notice prior to end of the five year period; therefore, it is important that you keep your contact information current with the IRB Office. Should you complete this study prior to the end of the five-year period, you must submit a Final IRB Progress Report for review.

Please reference the above IRB protocol number in all correspondence to the IRB c/o the Division of Research Integrity and Compliance. In addition, we have enclosed an Institutional Review Board (IRB) Quick Reference Guide providing guidelines and resources to assist you in meeting your responsibilities when conducting human subjects research. Please read this guide carefully.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-9343.

Sincerely,

Paul G. Stiles, J.D., Ph.D., Chairperson
USF Institutional Review Board

OFFICE OF RESEARCH • DIVISION OF RESEARCH INTEGRITY & COMPLIANCE
INSTITUTIONAL REVIEW BOARDS, FWA NO. 00001669
University of South Florida • 12501 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4790
(813) 974-5638 • FAX (813) 974-5618
Appendix F Data Analysis Plan
### Table 3.2

**Data Analysis Plan: Research Variables, Data Points, Variable Descriptions, Type of Data Analysis to be Performed**

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data/Variables</th>
<th>Type of Variables</th>
<th>Description</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. What is the association between dental hygienists’ intentions to treat and perceived self efficacy, perceived risk of being infected, attitudes and normative beliefs toward treating HIV/AIDS patients?</td>
<td>Int scale score Self scale score Risk scale score Att scale score Norm scale score</td>
<td>Independent / Dependent</td>
<td>Ordinal</td>
<td>Spearman correlation coefficient Int scale score x Self scale score Int scale score x Risk scale score Int scale score x Att scale score Int scale score x Norm scale score</td>
</tr>
<tr>
<td>3. Is there an association between Years in Practice and intention to treat HIV/AIDS patients?</td>
<td>41-Years in practice; Int scale score</td>
<td>Independent / Dependent</td>
<td>Continuous / Ordinal</td>
<td>Spearman correlation coefficient</td>
</tr>
<tr>
<td>4. Is there an association between Ever Treated an HIV+ patient as a student, and intention to treat HIV/AIDS patients?</td>
<td>43- Ever treated an HIV+ patient as a student; Int scale score</td>
<td>Independent / Dependent</td>
<td>Nominal / Ordinal</td>
<td>Kruskal-Wallis test for &gt; 2 groups</td>
</tr>
<tr>
<td>5. Is there an association between Ever Treated an HIV+ patient in private practice, and intention to treat HIV/AIDS patients?</td>
<td>44- Ever treated an HIV+ patient in private practice; Int scale score</td>
<td>Independent / Dependent</td>
<td>Nominal / Ordinal</td>
<td>Kruskal-Wallis test for &gt; 2 groups</td>
</tr>
<tr>
<td>Research Questions</td>
<td>Data/Variables</td>
<td>Type of Variables</td>
<td>Description</td>
<td>Analysis</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------</td>
<td>-------------------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>6. Is there an association between Knowing a friend or family member with HIV/AIDS, and intention to treat HIV/AIDS patients?</td>
<td>45- Knowing a friend or family member with HIV/AIDS; Int scale score</td>
<td>Independent / Dependent</td>
<td>Nominal / Ordinal</td>
<td>Mann Whitney rank sum test with 2 samples</td>
</tr>
<tr>
<td>7. What is the measure of association between dental hygienists’ intentions to treat, and perceived self efficacy, perceived risk of being infected, attitudes and normative beliefs toward treating HIV/AIDS patients?</td>
<td>Int scale score Self scale score Risk scale score Att scale score Norm scale score Potential confounders: Age, years in practice, treated as a student, treated in private practice, knowing person</td>
<td>Dependent / Independent</td>
<td>Ordinal / Nominal / Continuous</td>
<td>Multiple linear regression</td>
</tr>
</tbody>
</table>
No matter which side each of us reading this news may have taken on this issue, ultimately, it is a total win for the people we are all committed to serving!! I commend Tammy Byrd on her long, and probably, very lonely road throughout all of this................

Now, let's all move on to other barriers to improved access to care and maybe, just maybe, it'll all look much better soon!

Best,

Mary Ellen Yankosky
Boston, MA

http://www.ftc.gov/opa/2007/06/dentists.shtm

South Carolina Board of Dentistry Settles Charges That it Restrained Competition in the Provision of Preventive Care by Dental Hygienists

FTC Complaint Alleged Conduct Limited Needy Childrenâ€™s Access to Care

The Federal Trade Commission today announced a consent order settling charges brought in September 2003 that the South Carolina State Board of Dentistry unlawfully restrained competition in violation of Section 5 of the FTC Act by adopting a rule that required a dentist to examine every child before a dental hygienist could provide preventive care â€” such as cleanings â€” in schools. The Board adopted the rule in 2001, after the South Carolina legislature had eliminated a statutory requirement that a dentist examine
The Board is a state regulatory agency, composed primarily of practicing dentists, that licenses and regulates dentist and dental hygienists. The FTC alleged that the Board’s anticompetitive conduct led to fewer children receiving preventive dental care in schools—particularly economically disadvantaged children. As a result of legislation enacted by the South Carolina legislature in 2003, the Board no longer requires a dentist to examine each child before a hygienist’s exam in a public health setting. The consent order requires the Board to publicly announce its support for the current state policy that hygienists can provide such care in public health settings without a dentist’s examination and to notify the Commission before adopting rules or taking other actions related to preventive dental services provided by dental hygienists in public health settings.

As this case reflects, state regulatory boards that restrict competition in ways not contemplated by state law are subject to the antitrust laws, said Jeffrey Schmidt, Director of the FTC’s Bureau of Competition. This case is important because it protects access to preventive dental services for children especially those from low-income families in schools.

Terms of the Consent Order

The Commission’s consent order has two main features. First, it requires the Board to affirm and publicize its support for the state legislative policy that prevents the Board from requiring a dentist examination as a condition of dental hygienists providing dental care in public health settings. The order requires the Board to post the announcement on its website and publish it in its newsletter, as well as to distribute it to every licensed dentist and dental hygienist in South Carolina, as well as to new licensees for the next three years. It also requires the Board to send the announcement to all school district superintendents within the state. The Board’s announcement supporting the legislative policy can be found in Appendix A of the consent order on the FTC’s website. Second, to prevent similar anticompetitive conduct in the future, the order requires the Board to provide written notice to the Commission prior to the promulgation of any proposed or final rule, regulation, policy, issuance of a

Based on various factors particular to this case, the Commission has determined that it is not necessary to include a cease and desist provision that directly prohibits the Board from resuming its past conduct. Thus, the order will increase the FTC’s ability to monitor the Board’s future conduct, and is likely to help deter the Board from imposing similar restraints on public health preventive dental care in the future. The order expires in 10 years.

Case History

In 2000, the South Carolina legislature eliminated a statutory requirement that a dentist examine each child before a hygienist could
perform preventive dental care in a public health setting. The goal was to allow schoolchildren, particularly those from low-income families, to receive preventive dental care. In July 2001, however, the Board adopted an emergency regulation that re-imposed the dentist examination requirement. As a result of the Board's actions, a hygienist-owned company that had begun sending hygienists to schools to provide preventive care was forced to change its business model and was able to serve far fewer patients.

The Board's emergency regulation expired in six months, in January 2002. By that time, however, the Board had published a proposal to adopt the dentist examination requirement as a permanent regulation. After a state administrative law judge ruled that the Board's proposed regulation was unreasonable and contrary to state policy, the Board abandoned its attempt to make the regulation permanent. The state legislature subsequently enacted legislation in May 2003 expressly providing that examinations by a dentist are applicable in some settings when dental hygienists provide preventive care, but they are not required in public health settings under the direction of the state health department.

In July 2004, the Commission denied the Board's motion to dismiss the Board's complaint based on the Board's assertion that its actions were protected by the state action doctrine. The Commission, however, held the Board's motion to dismiss in abeyance pending discovery on factual issues relating to the risk of recurrence of the challenged conduct. The Board filed an appeal with the United States Court of Appeals for the Fourth Circuit seeking an interlocutory review of the Commission's state action ruling, and the Commission stayed discovery during the pendency of the Board's appeal on state action. In May 2006, the Court of Appeals dismissed the appeal for lack of jurisdiction. In January 2007, the Supreme Court denied the Board's petition for certiorari seeking review of the appellate court's dismissal of the appeal.

The Commission vote approving the complaint and consent order was 5-0. The order will be subject to public comment for 30 days, until July 19, 2007, after which the Commission will decide whether to make it final. Comments should be sent to: FTC, Office of the Secretary, 600 Pennsylvania Ave., N.W., Washington, DC 20580.

NOTE: A consent agreement is for settlement purposes only and does not constitute an admission of a law violation. When the Commission issues a consent order on a final basis, it carries the force of law with respect to future actions. Each violation of such an order may result in a civil penalty of $11,000.

Copies of the complaint, consent order, and analysis to aid public comment are available now on the FTC's Web site. The FTC's Bureau of Competition works with the Bureau of Economics to investigate alleged anticompetitive business practices and, when appropriate, recommends that the Commission take law enforcement action. To inform the Bureau about particular business practices, call 202-326-3300, send an e-mail to antitrust@ftc.gov, or write to the Office of Policy and Coordination, Room 394, Bureau of Competition, Federal Trade
Appendix G (Continued)

Commission, 600 Pennsylvania Ave, N.W., Washington, DC 20580. To learn more about the Bureau of Competition, read “Competition Counts” at http://www.ftc.gov/competitioncounts.

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Appendix H: ADHA Supervision / Direct Access Documents
States with General Supervision in the Private Office

The following states have general supervision in the private office. General supervision means that the dental hygienist may treat patients when the dentist is not present, based on some type of authorization by the dentist. However, the elements of general supervision vary by state. See below for a description of the requirements in each state.

Note that almost every state—even those without general supervision in the private office, have some provision for dental hygienists to provide services in some settings outside of the office under general supervision—or even allow dental hygienists direct access to patients in certain settings. Typically out of dental office supervision in the states listed below will be less restrictive than in-office supervision.

**AK** dentist has authorized the procedures and they are being carried out in accordance with the dentist's diagnosis and treatment plan

**AR** (definition from the rules) only with the expressed consent of the supervising dentist and only for brief intervals when the supervising dentist cannot be in the treatment facility not to exceed two (2) consecutive days; written protocols for emergencies as established by the supervising dentist.; hygienists must have one (1) full year of full-time experience, patients must be notified in advance; supervising dentist must have examined the patient(s) not more than twelve (12) months prior.

**AZ** is available for consultation, whether or not the dentist is in his office, over procedures which the dentist has authorized and for which the dentist remains responsible.

**CA** supervision of dental procedures based on instructions given by a licensed dentist
(Must at least briefly examine new patients one time before services)

**CO** requires the tasks be performed with the prior knowledge and consent of the dentist

**CT** performed with the knowledge of said licensed dentist

**DC** based on instructions given by a licensed dentist

**DE** authorizes the work to be performed. Emergency care and consultant services are provided by an "on-call" dentist not present in the treatment facility, if the primary dentist is not present.

**FL** supervision whereby a dentist authorizes the procedures which are being carried out but need not be present. The rules add that a licensed dentist examine the patient, and diagnose a condition to be treated.
Appendix H (Continued)

**IA** (rule defines supervision) a dentist has examined the patient and has prescribed authorized services to be provided by a dental hygienist. The dentist need not be present.

**ID** dentist authorize the procedure which is carried out, but not requiring that a dentist be in the office.

**IL** a dentist authorize the procedures which are being carried out, but not requiring that a dentist be present. In the dental office the patient must have been examined by the dentist within one year of the provision of dental hygiene services, the dentist has approved the dental hygiene services by a notation in the patient's record and the patient has been notified that the dentist may be out of the office during the provision of dental hygiene services.

**KS** dentist may delegate verbally or by written authorization the performance of a service, task or procedure to a licensed dental hygienist under the supervision and responsibility of the dentist, if the dental hygienist is licensed to perform the function, and the supervising dentist examines the patient at the time the dental hygiene procedure is performed, or during the 12 calendar months preceding the performance of the procedure.

**KY** the dentist has authorized a specific dental service or procedure but is not necessarily physically present.

**LA** dentist has authorized procedures which are being carried out according to dentist’s treatment plan.

**MA**, based on instructions given by a licensed dentist.

**MD** dental hygienist has at least 1,500 hours clinical practice; there is a written agreement between the supervising dentist and the dental hygienist with terms under which the dental hygienist may practice; notation of general supervision in the patient's records; dentist has examined and evaluated patient and prescribed and authorized. within prior 7 months; patient gives informed consent to general supervision; there’re written emergency procedures in which RDH is trained; designated dentist is available for consultation; hygienist may only work under general 60% of time she practices and supervising dentist may not employ more than two dental hygienists under general supervision at any given time.

**ME**

Rule
dentist is not required to be in the dental office at the time the procedures are being performed on a patient of record.
Appendix H (Continued)

A dentist has designated a patient of record upon whom services are to be performed and has described the procedures to be performed.

**MO**

Rules
dentist has authorized the procedure for a patient of record; patient informed that the dentist is not in the treatment facility; authorization written in the patient's record and is valid from the date of the most recent examination for a maximum of twelve (12) months.

**MN**

Rules dentist has authorized the procedures and they are being carried out in accordance with the dentist's diagnosis and treatment plan.

**MT**

Treatment provided with the intent and knowledge of the dentist.

**ND**

(definition in rules) a supervising dentist is available for consultation, diagnoses, and evaluation, has authorized the dental hygienist to perform the services, and exercises that degree of supervision appropriate to the circumstances.

**OH**

A dental hygienist may provide, for not more than fifteen consecutive business days, dental hygiene services to a patient when the supervising dentist is not physically present IF hygienist has at least two years and a minimum of three thousand hours of experience; completed a course approved by the state dental board in the identification and prevention of potential medical emergencies; .

complies with written protocols for emergencies the supervising dentist establishes.; does not perform procedures while the patient is anesthetized, definitive root planing, definitive subgingival curettage, dentist has evaluated the dental hygienist's skills;
Appendix H (Continued)

has examined the patient not more than seven months prior; hygienist complies with written protocols or written standing orders that the supervising dentist establishes;

dentist completed and evaluated a medical and dental history of the patient not more than one year prior; dentist determines that the patient is in a medically stable condition.

OK dentist has previously diagnosed the condition to be treated, personally authorizes the procedures, and will evaluate the progress of the dental treatment within a reasonable time as determined by the nature of the procedures performed, the needs of the patient, and the professional judgment of the supervisory dentist. Authorization for general supervision is at the discretion of the supervisory dentist and limited to a maximum of thirteen (13) months following examination by the supervisory dentist of a patient of record.

OR dentist authorize the procedures

PA At the present time, in a dental facility requires a dentist examine the patient, develop a dental treatment plan, authorize the performance of dental hygiene services to be performed within 90 days of the examination, and take full professional responsibility for the performance of the dental hygienist for patients who fall under ASA Class I only supervision (American Society of Anesthesiologists classification for a patient without systemic disease). However, a recent law change will do away with ASA classifications. The new definition, which doesn't take effect for a couple of months, reads: "general supervision" means supervision by a dentist who examines the patient, develops a dental treatment plan, authorizes the performance of the radiologic services to be performed within one year of the examination, and takes full professional responsibility for performance of the dental hygienist

RI from the rules dentist has authorized the procedure/duty and such is being carried out in accordance with his/her diagnosis and treatment plan.

SC Authorized" means the supervising dentist in a private office setting has personally approved the procedures to be performed and is responsible for the care provided to the patient. A dentist in a private office setting may authorize general supervision only if a new patient of record must is examined during the initial visit; an appointed patient is examined by at a minimum of twelve-month intervals and appointed patient is notified in advance he or she will be treated by the dental hygienist under general supervision
SD dentist authorize the procedures to be carried out, and that the patient to be treated is a patient of record of the supervising dentist and has had a complete evaluation within the previous thirteen months of the delegation of procedures;

TN the dentist has personally diagnosed the condition to be treated, has personally authorized the procedures being performed and will evaluate the performance of the dental hygienist.

TX dentist may delegate orally or in writing a service, task, or procedure to a dental hygienist who is under the supervision and responsibility of the dentist, if: dentist examines the patient: at the time the procedure is performed or (B) during the 12 calendar months preceding the supervising dentist is available for consultation regarding work the supervising dentist has authorized.

VA a dentist has evaluated the patient and prescribed authorized services to be provided.

VT dentist agreeing to procedures or treatment performed by appropriate personnel and being available for consultation.

WA procedures based on examination and diagnosis of the patient and subsequent instructions given by a licensed dentist.

WI requires a written or oral prescription, dentist has examined the patient at least once during the 12-month period immediately preceding, prescription specifies the practices and procedures that the dental hygienist may perform, if performed in a dental office, the patient has been the dentist's patient of record for not less than 6 months.

WY (definition in rules) dentist has diagnosed and authorized the procedures which are being carried out; however, a dentist need not be present.

Citation: ADHA. (June, 2007). Provision of governmental affairs chart.
Appendix H (Continued)

DIRECT ACCESS STATES

For purposes of this document, direct access means that the dental hygienist can initiate treatment based on his or her assessment of patient’s needs without the specific authorization of a dentist, treat the patient without the presence of a dentist, and can maintain a provider-patient relationship.

**Arizona 2004**
Sec 32-1289

A dental hygienist with a written affiliated practice agreement with a dentist may assess for and perform dental hygiene services on patients under 18 years who meet certain financial criteria and are enrolled in a federal, state, county or local healthcare program.

Special requirements: 5 years practice

Services: Any dental hygiene services specified in the affiliated practice agreement except root planing, local anesthesia, nitrous oxide or placing sutures.

**California 1998** (*California has two different provisions for unsupervised practice*)
Sec. 1774, 1775

Dental hygienists endorsed as RDHAPs (registered dental hygienist in alternative practice) may provide services without supervision for homebound persons or at schools, residential facilities, institutions and in dental health professional shortage areas for up to 18 months, and provide further services if the patient obtains a prescription from a dentist or physician. RDHAP’S may own an alternative dental hygiene practice. Currently, there are more than 100 RDHAP’s.

Special Requirements: Bachelors degree equivalent, 3 years clinical practice, completion of 150 clock hour special course and exam.

Services: Those services permitted under general supervision (which include oral prophylaxis, root planing, pit and fissure sealants, charting and examination of soft tissue).

**California 2002**
Sec 1763 (a) 2002 Any dental hygienist may provide screening, apply fluorides and sealants without supervision in government created or administered public health programs.

- In 2006, more than 100 RDHAP’s registered.
- A dental hygienist mobile practice treats 25/35 disabled patients per week.
- Direct Medicaid reimbursement allowed.
Appendix H (Continued)

**Colorado - 1987**
Sec. 12-35-122.5

Unsupervised practice in all settings for all licensed dental hygienists for the oral prophylaxis and preventive and therapeutic services. The dental hygienist may also own a dental hygiene practice.

Special Requirements: None.

Services—remove deposits, accretions, and stains, curettage without anesthesia, apply fluorides and other recognized preventive agents, oral inspection and charting, topical anesthetic. However, x-rays require general supervision and local anesthesia requires direct supervision.

- Direct Medicaid reimbursement allowed. In fiscal year 2003-04 16 independent RDH’s provided 199,518 in services to 2,284 Medicaid children.

**Connecticut 1999**
Section 20-126l.

Dental hygienists with 2 years experience may practice without supervision in institutions, public health facilities, group homes and schools.

Special Requirements: 2 years experience.

Services: Oral prophylaxis, remove deposits, accretions and stains, root planning, sealants, assessment and treatment planning.

- Since 7/1/2003 hygienists have program has provided over 55,000 dental procedures—nearly 7,000 prophyls/fluorides, 5,800 sealants and 15,000 exams.
- Direct Medicaid reimbursement allowed.
Appendix H (Continued)

Iowa 2004
Rule 650-10.5 (153)

Dental hygienists may provide services based on standing orders and a written agreement with a dentist in schools, Head Start settings, FQHCs (Federally Qualified Health Centers), public health vans, free clinics, community centers and public health programs. As of 2005, 15 hygienists held public health permits.

Special Requirements: RDH must have 3 years clinical experience and submit annual report on number of patients/services to department of health.

Services: All dental hygiene services (except local anesthesia and nitrous) may be provided once to each patient. To perform repeat services other than assessment, screening and fluoride, dentist must examine.

- Active Public Health Supervision agreements in place between Iowa dentists and dental hygienists.
- Services in 2005: 17,332 clients received sealants, 18,942 received screenings, 6,098 received fluoride applications, over 281 received prophys, and 7,157 received education.
- In 2006, 24 public health RDHs.

Kansas 2003
Sec. 65-1456

Dental hygienist with 1800 hours experience can obtain an extended care permit to treat patients in schools, headstart programs, state correctional institutions, local health departments, indigent care clinics, adult care homes, hospital long term units, or at the home of homebound persons on medical assistance. No prior authorization is needed, but the hygienist must have an agreement with a sponsoring dentist who will monitor his/her practice. Services permitted are the oral prophylaxis, application of fluoride, dental hygiene instruction, assessment of the patient's need for further treatment by a dentist and other services if delegated by the sponsoring dentist.

- As of April 2006, there were 41 extended care permit dental hygienists.
Appendix H (Continued)

Maine 2001
Rule 02 313 Chap. 1. Sec. 4

A dental hygienist may practice in a public or private school, hospital or other non-traditional practice setting under a public health supervision status granted by the dental board on a case-by-case basis. The hygienist may perform all services rendered under general supervision.

The dentist should have specific standing orders and procedures to be carried out, although the dentist need not be present when the services have been provided. A written plan for referral or an agreement for follow-up shall be provided by the public health hygienist recording all conditions that should be called to the attention of the dentist. The supervising dentist shall review a summary report at the completion of the program or once a year.

Special Requirements: A dental hygienist must apply to the board to practice providing such information the board deems necessary. The board must take into consideration whether the program will fulfill an unmet need, whether a supervising dentist is available and that the appropriate public health guidelines and standards of care can be met and followed.

Services: All services that can be provided under general supervision. Dentist’s diagnosis for sealants not needed in public health or school sealant programs.

- From 3/02 through 10/04, over 5,500 patients were provided care in over 400 clinics. Nearly 30 dental hygienists are involved in this particular program.
- Direct Medicaid reimbursement allowed.

Michigan 1991
Sec. 333.16625

A dental hygienist may apply to the Department of Community Health to become designated as a “grantee health agency” for a 2 year period, during which time hygienist can administer dental hygiene services to patients not assigned to a dentist as part of a program in dentally underserved populations. Dental hygienists practicing as grantee health agencies must work under the supervision of a licensed dentist for a public or nonprofit entity, school, or nursing home that employs or contacts with at least one dentist or dental hygienist and provides care to an underserved population.

Special requirements: Dental hygienists interested in attaining grantee health agency status must submit a comprehensive form outlining how the program will be carried out, providing for oversight and direction, and including information for all dental personnel involved. A dental hygienist operating as a grantee health agency must ensure that the supervising dentist is available for consultation when necessary.
Appendix H (Continued)

Minnesota 2001
Section 150A. 10, subd. 1a

A dental hygienist may be employed or retained by a health care facility, program, or nonprofit organization to perform dental hygiene services without the patient first being examined by a licensed dentist if the dental hygienist has entered into a collaborative agreement with a licensed dentist that designates authorization for the services provided by the dental hygienist.

Health care facility is defined as a hospital, nursing home, home health agency, disabled/juvenile home, federal/state/local public health facility, community clinic, prison, tribal clinic/school authority, Head Start program, or nonprofit organization that serves individuals who are uninsured or who are Minnesota health care public program recipients.

A collaborative agreement means a written agreement with a licensed dentist who authorizes and accepts responsibility for the services performed by the dental hygienist. The services may be performed without the presence of a licensed dentist and may be performed at a setting other than the usual place of practice of the dentist or dental hygienist and without the dentist’s diagnosis/treatment plan unless specified in the agreement.

Special Requirements: Has been engaged in the active practice of clinical dental hygiene for not less than 2,400 hours in the past 18 months or a career total of 3,000 hours, including a minimum of 200 hours of clinical practice in two of the past three years. Has documented participation in courses in infection control and medical emergencies within each continuing education cycle and maintains current certification in advanced or basic cardiac life support as recognized by the American Heart Association, the American Red Cross, or another agency that is equivalent to the American Heart Association or the American Red Cross.

Services: Removal of deposits and stains from the surfaces of the teeth, application of topical preventive and prophylactic agents, sealants, fluoride varnishes, polishing and smoothing restorations, removal of marginal overhangs, performance of preliminary charting, taking x-rays and root planing. A dental hygienist can provide sealants and fluoride varnishes without the patient first being examined by a licensed dentist.

Restorative Services: a licensed dental hygienist or a registered dental assistant may perform the following restorative procedures:

- Place, contour, and adjust amalgam restorations;
- Place, contour, and adjust glass ionomer;
- Adapt and cement stainless steel crowns; and
- Place, contour, and adjust class I and class V supragingival composite restorations where the margins are entirely within the enamel.

The restorative procedures may be performed only if:

- The licensed dental hygienist or the registered dental assistant has completed board-approved courses on the specific procedures which include a course that sufficiently prepares the dental
Appendix H (Continued)

- At least 25 dental hygienists had qualified for collaborative practice in 2006.
- Direct Medicaid reimbursement allowed.

**Missouri 2001**

Statute 332.311.2

Dental hygienists may provide services without supervision in public health settings to Medicaid eligible children and be directly reimbursed by Medicaid.

Special Requirements: 3 years experience.

Services: Oral prophylaxis, sealants, fluorides.

- One particular dental hygienist has seen a sealant program grow from one school district to eight. Over 2,500 sealants have been placed on over 700 children.
- Direct Medicaid reimbursement allowed.
- In 2006, were 12 registered providers.

**Montana 2003**

Sec. 37-4-405

Dental hygienists may obtain a limited access permit from the board allowing them to practice under public health supervision in a variety of federally funded health centers and clinics, nursing homes, extended care facilities, home health agencies, group homes for the elderly, disabled, and youth, headstart programs, migrant work facilities and local and state public health facilities. Public health supervision means the hygienist can provide oral prophylaxis, fluoride, polish restorations, root plane, sealants, oral cancer screening, expose radiographs, and chart without the authorization of a dentist provided he or she follows protocols to be established by the board and refers any patients needing dental treatment.

- Program took effect in September of '04, 10 permits in '06.
Appendix H (Continued)

Nebraska 2007
Sec. 71-193.18

The Department of Health may authorize an unsupervised RDH to provide public health services in a public health setting or a healthcare or related facility.

Special requirements:
3000 hours experience in at least 4 of last 5 years; professional liability insurance.

Services:
Prophylaxis for a health child, pulp vitality testing, preventive measures including fluorides & sealants.

New Hampshire 1993
Rule 101.11(d)

Under public health supervision dental hygienists may provide procedures authorized by a dentist in a public or private school, hospital or institution, or residence of a homebound patient provided the dentist reviews patient records once in a 12 month period.

Special Requirements: None.

Services: Instruction in oral hygiene, topical fluorides, oral prophylaxis, assess medical/dental history, periodontal probing/charting.
Appendix H (Continued)

**New Mexico 1999**
Sec. 61-5A-4D
Rule 16.5.17

Collaborative practice permits based on a written agreement between the dental hygienist and one or more consulting dentist(s), dental hygienists to treat patients according to a protocol with collaborative dentist. Dental hygienists may own or manage a collaborative dental hygiene practice in any setting. Must refer patient for dental exam yearly.

Special Requirements: 2400 hours active practice in past 18 months or 3000 hours in 2 of past 3 years.

Services: Each collaborative practice agreement must contain protocols for care. Which provide for standing orders allowing the dental hygienist to provide routine services such as preliminary assessment, x-rays, oral prophylaxis and fluoride treatment without prior authorization. Case-by-case authorization required in some procedures (as sealants and root planning).

- **One collaborative practice arrangement that started in 2002, serves a patient base of 4,000 people-1/3 of which are Medicaid eligible.**
- **Direct Medicaid reimbursement allowed.**
- **In 2006, there were 35 collaborative practice RDHs.**

**New Mexico 2007**
Sec. 61-5-C

No supervision required for any dental hygienist to apply fluorides, and remineralization agents.

**New York 2005**
Rules Sec. 61.9

That a supervising dentist be available for consultation, diagnosis and evaluation, has authorized the dental hygienist to perform the services, and exercises that degree of supervision appropriate to the circumstances.” A dental hygienist can work in any setting (private or public) and perform dental hygiene duties (listed below) without a dental examination or need to refer a patient to a dentist.

Dental hygiene services allowed include removing calcareous deposits, accretions and stains, including scaling and planning of exposed root surfaces; applying topical agents indicated for a complete dental prophylaxis; removing excess cement from surfaces of the teeth; providing patient education; placing and exposing X-ray films; performing topical anticariogenic agent applications, including but not limited to topical fluoride applications, and performing topical anesthetic applications; polishing teeth, including existing restorations; taking medical history including the measuring and recording of vital
signs; charting caries and periodontal conditions as an aid to diagnosis by the dentist; applying pit and fissure sealants; and applying desensitizing agents to the teeth.

In nursing homes a hygienist can perform a complete oral examination of a resident and then determine treatment priorities; plan for continuing oral hygiene and dental care.

- In 2005, dental hygienists have screened and provided sealants for over 30,000 children.
- About 100,000 children in New York received care in school-based programs overseen by dental hygienists.

**Nevada 1998**

Statute 631.287

Dental hygienists may obtain approval to work as public health dental health hygienists in schools, community centers, hospitals, nursing homes and such other locations as the state dental health officer deems appropriate without supervision.

- 33 RDH’s have gained board approval. Nevada Health Centers, Inc. where some RDH’s are employed, provides services in eighteen different locations in Nevada. Dental hygienists with Public Health endorsement can also screen and place sealants without a dentist present. Additional locations include Saint Mary’s, Huntridge Teen Center & Lyon Co. Healthy Smiles.
- Direct Medicaid reimbursement allowed.

**Oklahoma 2003**

Sec. 328.34 C

A dentist may authorize in writing a dental hygienist with 2 years experience to perform services one time on a patient in a setting outside the office prior to any dentist contact/exam if the hygienist refers the patient back to the authorizing dentist.
Appendix H (Continued)

Oregon 1997

Sec. 680.200
Rule 818-035-0065

Dental hygienists who have obtained a limited access permit (LAPS) may initiate services for patients in a variety of limited access settings such as extended care facilities, facilities for the mentally ill or disabled, correctional facilities, schools and pre-schools, and job training centers. RDH must refer the patient annually to a licensed dentist available to treat the patient.

12 hours of CE every two years (in addition to the 24 hours required for all dental hygienists) to renew permit.

Services-- All dental hygiene services, except that some (local anesthesia, pit and fissure sealants, denture relines, temporary restorations, radiographs and nitrous oxide) must be preauthorized by a dentist.

- In 2006, there were 70 LAP’s.
- In the last year, LAP dental hygienists in 3 counties provided over 5,000 preventative procedures for children in Headstart, Early Headstart, WIC a public health settings.
- Several LAP hygienists throughout Oregon continue to build practices serving the elderly in foster homes and extended care facilities.
- Direct Medicaid reimbursement allowed.

Pennsylvania 2007

Dental hygienists licensed in Pennsylvania who have at least 3,600 hours of clinical experience who purchase liability insurance can practice as “public health dental hygiene practitioners,” providing care in a variety of public health settings without the supervision or prior authorization of a dentist. Public health dental hygiene practitioners are able to administer the educational, preventive, therapeutic, and intra-oral services, including complete prophylaxis and sealants, dental hygienists in the state are authorized to provide. Public health dental hygiene practitioners are required to take five hours of continuing education dedicated to public health matters during each licensure period.
Appendix H (Continued)

**Washington 1984** (*Washington has two different provisions for unsupervised practice*)
Sec. 18.29.056

Unsupervised practice in hospitals, nursing homes, home health agencies, group homes (for the elderly, handicapped or youth), state institutions under department of health and human services, jails, and public health facilities provided the hygienist refers patient to a dentist for dental treatment and needed care.

Special requirements: Two years clinical experience within the last five years.

Services -- removal of deposits and stains, application of topical preventive or prophylactic agents, polishing and smoothing restorations, root planing, curettage and local anesthesia. (The dental board has ruled that sealants are not included, but require general supervision).

**Washington 2001**
Statute 18.29.220

Dental hygienists who are school endorsed may assess for and apply sealants and fluoride varnishes in community-based sealant programs carried out in schools.

Special Requirements: Sealant/Fluoride Varnish Endorsement from Department of Health.

- Data obtained through Medicaid indicates that dental hygienists working under these provisions saw 5,653 clients in 2002; 6,799 in 2003, and 4,265 through July of '04. Specifically in terms of sealants, over 19,200 sealants have been placed since Dec. 2003.
- Direct Medicaid reimbursement allowed.

Division of Governmental Affairs  July, 2007
www.adha.org
Appendix I: Personal Communication
From: KanWatsu@aol.com
Sent: Thursday, July 12, 20076:30 PM To:
Clark-Alexander, Barbara
Subject: Re: Invitation to take the Dental Hygienists / Treating HIV / AIDS Patients S ...

Greetings Ms Clark, RDH

I am impressed that you are conducting this research and using this survey to assist with treatment for those that need it, no matter what their health status; as they need it the most! I remember when this disease was first "discovered and named" and the "stigma" that followed. I have compassion for all those infected and those in our profession that choose not to treat. May there be more of us that do choose to provide dental hygiene services.

Good luck on furthering your education and assisting those that need our services.

Sincerely,
Rev Kanela Barton, RDH
About the Author

Barbara Clark-Alexander received her Bachelor of Science in Dental Hygiene Public Health from the University of Minnesota in 1978. After moving to Florida, she coordinated clinical trial studies for the National Institutes of Health and Colgate Palmolive Company, and received a Master’s Degree in Public Health from the University of South Florida in 1989.

In 1990, she joined the Florida Health Information Center USF where she managed studies on aging, Medicaid managed care, full service schools, adolescent risk behaviors, and the Florida Family AIDS Network.

During her doctoral studies, Ms. Clark-Alexander was an instructor and guest speaker for both graduate and undergraduate courses at the USF COPH, and continuing education courses in HIV/AIDS to dental professionals. She is currently a member of: the Ryan White Care Council and numerous advisory committees. She has been the recipient of a Florida Public Health Association scholarship, and student scholarship awards at the COPH.