

Fall 11-4-2016

# Importance and Value of HIV Education Amongst Dental Hygiene Student Providers

Shawndell Bowers

Follow this and additional works at: [https://digitalrepository.unm.edu/dehy\\_etds](https://digitalrepository.unm.edu/dehy_etds)



Part of the [Dental Hygiene Commons](#)

---

## Recommended Citation

Bowers, Shawndell. "Importance and Value of HIV Education Amongst Dental Hygiene Student Providers." (2016).  
[https://digitalrepository.unm.edu/dehy\\_etds/14](https://digitalrepository.unm.edu/dehy_etds/14)

This Thesis is brought to you for free and open access by the Electronic Theses and Dissertations at UNM Digital Repository. It has been accepted for inclusion in Dental Hygiene ETDs by an authorized administrator of UNM Digital Repository. For more information, please contact [disc@unm.edu](mailto:disc@unm.edu).

Shawndell L. Bowers

---

*Candidate*

Department of Dental Medicine

---

*Department*

This thesis is approved, and it is acceptable in quality and form for publication:

*Approved by the Thesis Committee:*

Christine Nathe, RDH, MS, Chairperson

---

Diana Aboytes, RDH, MS

---

Christina Calleros, RDH, MS

---

---

---

---

---

---

**Importance and Value of HIV Education Amongst Dental Hygiene  
Student Providers**

By

**SHAWNDELL L. BOWERS**

B. S., Dental Hygiene, The University of New Mexico, 2015  
M.S., Dental Hygiene, The University of New Mexico, 2016

THESIS

Submitted in Partial Fulfillment of the  
Requirements for the Degree of

**Master of Science  
Dental Hygiene**

The University of New Mexico  
Albuquerque, New Mexico

**December, 2016**

## **DEDICATION**

First, and foremost, this body of work is dedicated to my loving family and friends. Throughout my academic endeavors, they have been the key to my successes. Their constant love, dedication, and support in the efforts put forth throughout my attendance in this program have allowed me the ability to pursue my educational dreams and aspirations.

The path taken to become a well-rounded oral healthcare professional began with the passion and confidence that my professors and fellow colleagues have instilled upon myself. They have given me the inspiration and conviction to build upon my abilities as a provider and educational foundation I have come to appreciate in my academic and professional endeavors. Without their support and knowledge, I would have never have become the capable person I am today.

## **ACKNOWLEDGEMENTS**

There have been many individuals that have provided valuable time and effort in ensuring the success and completion of my graduate studies and thesis project. I am forever grateful and indebted to your sincerity in helping me through these endeavors.

The University of New Mexico Dental Hygiene program professors, staff, and faculty have provided me the opportunity to work alongside the most capable and compassionate people I have ever been acquainted with. Their support and guidance has been essential in my successful completion of these academic pursuits.

As part of my committee, Christine Nathe, RDH, M.S., Diana Aboytes, RDH, M.S., and Christina Calleros, RDH, M.S. have given me nothing but their upmost enthusiasm, expertise, and encouragement in my graduate pursuits. My accomplishments are entirely due to their dedication in seeing me succeed.

# **Importance and Value of HIV Education Amongst Dental Hygiene Student Providers**

**By**

**Shawndell L. Bowers**

B.S. Dental Hygiene, The University of New Mexico, 2015  
M.S., Dental Hygiene, The University of New Mexico, 2016

## **ABSTRACT**

Persons living with HIV have an increased risk of complications and manifestations that may include the oral cavity. They are also more susceptible to dental implications such as dental decay and periodontal disease. Their oral health management is dependent on capable dental providers that understand and comprehend their specific needs. Those providers must also demonstrate ethical and clinical competence in order to provide comprehensive care. Preparing capable dental hygiene providers is essential to their long-term management of their oral health. These foundational skills are developed during their academic years and therefore, this qualitative survey was aimed at gaining student perceived knowledge, prejudices, and willingness to treat this population within a clinical environment. Statistical analysis focused on testing associated relationships of program level with various study questions. Participants were also assessed for their perceptions

on their academic preparedness and views on various educational methodologies that incorporate HIV education within their dental hygiene program didactic courses.

# TABLE OF CONTENTS

<b>DEDICATION</b> .....	iii
<b>ACKNOWLEDGEMENTS</b> .....	iv
<b>ABSTRACT</b> .....	v
<b>LIST OF FIGURES</b> .....	ix
<b>LIST OF TABLES</b> .....	x
<b>CHAPTER I INTRODUCTION</b> .....	1
<b>Introduction</b> .....	1
<b>Statement of the Problem</b> .....	1
<b>Significance of the Study</b> .....	1
<b>CHAPTER II LITERATURE REVIEW</b> .....	5
<b>Introduction</b> .....	5
<b>Ethical Implications of Treating HIV/AIDS Patients</b> .....	7
<b>Incorporating Student Perceived Knowledge within a Dental Healthcare Program Curriculum</b> .....	9
<b>HIV Healthcare Disparities and Increasing Community Efforts</b> .....	12
<b>CHAPTER III METHODS AND MATERIALS</b> .....	14
<b>Introduction</b> .....	14
<b>Hypothesis</b> .....	14
<b>Sample and Design</b> .....	14
<b>Data Collection</b> .....	16
<b>Data Analysis</b> .....	16
<b>CHAPTER IV RESULTS, DISCUSSION, AND CONCLUSION</b> .....	18
<b>Summary of Results</b> .....	25
<b>Limitations</b> .....	28
<b>CHAPTER V ARTICLE FOR SUBMISSION</b> .....	31
<b>TITLE PAGE</b> .....	31
<b>ABSTRACT</b> .....	32
<b>CLINICAL RELEVENCE</b> .....	33
<b>Introduction</b> .....	33

<b>Study population and methodology</b> .....	34
<b>Results</b> .....	35
<b>Discussion</b> .....	40
<b>REFERENCES</b> .....	46
<b>APPENDICES</b> .....	49
<b>APPENDIX A: HRRC APPROVAL LETTER</b> .....	50
<b>APPENDIX B: STUDY QUESTIONNAIRE</b> .....	54
<b>APPENDIX C: RECRUITMENT EMAIL</b> .....	57
<b>APPENDIX D: CONSENT FORM</b> .....	59

## **LIST OF FIGURES**

Figure 1: Student awareness of HIV dental and oral manifestations. ....	19
Figure 2: Student perceived program preparedness. ....	21
Figure 3: Student comfort level in treating patients in an HIV specialty clinic.....	22
Figure 4: Student perceptions of adding educational measures. ....	23

## LIST OF TABLES

Table 1: P Value Analysis.....	25
--------------------------------	----

# CHAPTER I

## INTRODUCTION

### **Introduction**

Human Immunodeficiency Virus (HIV) is an acquired viral infection that affects the T cells, CD4 cells, of the immune system by destroying these cells and compromising the individual to other infections and diseases.<sup>1</sup> These compromises include oral manifestations and their resulting implications.<sup>2</sup> In order to treat these oral manifestations, the dental provider is an integral component to their overall care.<sup>2, 3</sup> Successful treatment is dependent upon the patient's daily plaque removal and the clinical treatment of the provider.<sup>2, 3</sup>

### **Statement of the Problem**

- What roles do student dental hygiene providers play in the treatment of patients living with HIV?
- What are the perceived knowledge and attitudes of student dental hygiene providers towards treatment of HIV patients?
- Does fear and prejudices affect the comfort level and willingness to treat patients living with HIV amongst student dental hygiene providers?

### **Significance of the Study**

In the United States there is an estimated 1.2 million persons living with HIV. Approximately 168, 300 (1 in 8 cases) are unaware of their infection and the estimated

number of approximately 50,000 newly infected persons per year has remained relatively stable over the past decade.<sup>4</sup> From 2005 to 2014, the reported amount of new cases fell by 19 percent suggesting a decline in new infections. Despite this new trend, progress remains uneven and diagnoses have increased among certain groups with the most affected population being gay and bisexual men at an estimated 67 percent of newly diagnosed cases.<sup>4</sup> There is no cure for HIV and therefore, requires life-long treatments such as antiretroviral therapy (ART) and medications for opportunistic infections.<sup>1</sup>

HIV may manifest itself within the oral cavity.<sup>2</sup> Such manifestations are partly due to related immunosuppression, behavior of the disease, the therapy modalities being employed, and the individual's genetic variation.<sup>2</sup> These variations equate to a twofold increased risk, or 30 to 40 percent of this population, of infected individuals presenting or developing oral malignancies.<sup>2</sup> Oral malignancies include AIDS-related cancers such as Kaposi's sarcoma, Hodgkin's lymphoma, non-Hodgkin's lymphoma, basal cell carcinoma, leiomyoma, and leiomyosarcoma, and oral squamous cell carcinoma.

The advancement in the treatment modalities for HIV have provided the means of managing the disease and allowing for infected individuals to live longer and normal lives.<sup>2,5</sup> Their continued overall health will also increase the need for their oral health care due to there being sufficient evidence showing one's overall health is directly proportional to their oral health and that the obtaining oral healthcare can "improve oral health, reduce the risk of oral disease, and prevent the progression of existing disease."<sup>2,3,5</sup> Individuals who are HIV positive are also at a higher risk for caries, periodontal disease, and xerostomia and therefore it is imperative for the patient to continue to receive routine dental care in order to maintain their oral healthcare.<sup>2,3,5</sup>

The role of the dental hygienist in the care of the HIV positive patient is to be able to see changes within the oral cavity that would suggest further treatment and referral, be knowledgeable about the disease, and be a willing participant in their care in order for the patient to retain their care and oral health status.<sup>2,5</sup> Current studies suggest that there are disparities between access to care and HIV status.<sup>3,5</sup> These barriers include lack of dental insurance, patient experiences in the dental office, fear of dentists, and the related stigma of being HIV positive.<sup>3</sup> As healthcare providers, these barriers must be addressed and overcome by the dental hygienist so as to provide quality care to these individuals when maintaining their oral health. This is important due to the possible negative impact the disease has on the oral cavity.<sup>3</sup>

In order to provide the necessary treatment modalities, dental hygiene providers must first possess an understanding and comprehension of the disease's etiology and epidemiology.<sup>6</sup> This preparation is then partly the responsibility of the dental hygiene educational program to provide adequate time and resources within their respective curriculum and clinical settings to provide their students the opportunity to treat the HIV population.<sup>6</sup> Educating students within a clinical setting and applying patient-centered care is a complex process and when clinical knowledge lacks awareness, skills, and knowledge of systemic diseases such as HIV, the dental care provider's treatment plan is limited, lacks quality, and potentially risks the patient's overall health.<sup>6</sup> Having a sufficient and diverse educational background, is therefore, imperative to provide comprehensive treatment that is of the upmost quality within all populations.

### **Operational Definitions**

- Acquired Immunodeficiency Syndrome (AIDS)- an immunosuppressive viral

disease that is characterized by specific suppression in the immune response and associated with a wide variety of manifestations and illnesses such as opportunistic infections, poor resistance to infection, wasting, and numerous oral manifestations.

- Antiretroviral therapy (ART)- a combination of antiretroviral (ARV) drugs used to suppress and stop the progression of HIV virus. May also be used to prevent onward transmission of the virus and those for pre-exposure prophylaxis to persons with substantial risk of infection.
- Autonomy- the ability to make a choice or decision and exists for both the patient and the healthcare provider.
- Dental care provider - a health care provider that specializes in the dental setting and implementation of such care, i.e. dental hygienist and dentist.
- Human Immunodeficiency Virus (HIV)- a retrovirus that infects T lymphocytes (CD4+) and other cells, leading to immunosuppression and eventual AIDS.
- Personal protection equipment- attire and garments worn with the intent to protect the provider from exposure that cannot be controlled through use of engineering, administrative, or work-related practice controls.
- Rapid oral fluid test- a non-invasive, alternative test that utilizes oral fluid as its specimen for the use of screening. The results are produced usually within thirty minutes or less. Results are considered preliminary and are initial testing technique, require follow-up testing if the result is positive.

## CHAPTER II

### LITERATURE REVIEW

#### Introduction

In 2000, research conducted by the Rand Corporation found that fifty-eight percent of HIV positive individuals did not see a dentist regularly, within the last six months, and twenty percent reported that they had an unmet dental care need in the previous six months.<sup>5</sup> They also found that programs that were geared towards treating such patients, i.e. comprehensive HIV treatment program, were most successful in their treatment and may be because of higher incidence of referrals and funding available for care in this particular setting.<sup>5</sup> These inconsistencies highlight the disparities between the needs of the patients and the resources available to them.<sup>5</sup> Approaches that can be made to reduce these inconsistencies would be to utilize the dental clinical setting as a means of on-site HIV testing to at-risk individuals and others at the discretion of the patient and provider, for healthcare providers to employ dental care managers for their dental treatment needs, provide healthcare providers with education, and for community partnerships amongst private and public facilities to address the patients' overall healthcare needs.<sup>3, 5, 6, 7, 8, 9, 10</sup>

#### Oral Implications of HIV/AIDS

Persons who are HIV-positive have more than a “twofold increased risk of malignant disease, and an estimated 30% to 40% of them will develop a malignant disease.”<sup>2</sup> These malignancies include Kaposi’s sarcoma, Hodgkin’s lymphoma, non-

Hodgkin's lymphoma, basal cell carcinoma, cervical cancer, seminoma, leiomyoma, and leiomyosarcoma which are associated with AIDS- positive patients.<sup>2</sup> HIV- positive associated malignancies include Hodgkin's lymphoma, hepatocellular carcinoma, and anogenital epithelial neoplasia have been associated, whereas the risk for testicular seminoma, multiple myeloma, melanoma, and oral squamous cell carcinoma have only limited data associations.<sup>2</sup> Oral malignant disease may occur before a diagnosis and may arise during the progression of the disease.<sup>2</sup> One aspect that has reduced the development of oral manifestations was the introduction of highly active antiretroviral therapy.<sup>2</sup> Despite this reduction, oral verrucous lesions caused by the human papilloma virus infection have increased and lymphoma, the most rapidly increasing malignant disease amongst this population, has not been affected.<sup>2</sup>

Persons living with HIV or AIDS are at a higher risk for developing caries, periodontal disease, oral lesions, and xerostomia.<sup>3</sup> When preventive services are utilized the maintenance and improvement of this population's oral health has shown to reduce the risk of oral disease and prevent the progression of existing diseases to include decreased caries risk, improved periodontal health, and increased retention of existing teeth.<sup>3</sup> This increased care also may lead to the reduction of dental pain and discomfort while improving their ability to "eat, speak, and socialize."<sup>3</sup> Therefore, due to the numerous oral implications of HIV and AIDS, it is imperative that persons living with HIV or AIDS have an appropriate knowledge base and practices of home and professional oral care.<sup>13</sup> Several studies have shown that with increasingly poor oral hygiene this population's risk for oral complications also increases and may result in other aspects of their health to suffer.<sup>13</sup> Regarding current home care practices of HIV-

positive patients, one study showed that since their diagnosis only 26 percent reported daily flossing, 34 percent reported brushing and flossing more often, 23 percent reported seeing a dentist less frequently, and 11 percent reported never doing self-examinations within the oral cavity.<sup>13</sup> These inconsistencies shed light on the importance of dental providers incorporating oral hygiene instruction within their dental hygiene care plan while taking into consideration their attitudes and knowledge of oral healthcare.<sup>13</sup>

Patients that are HIV positive have a higher risk of oral conditions that are known to significantly compromise their oral and overall health.<sup>2, 6, 13</sup> Despite this higher risk, there is evidence that suggests that there are barriers to their care based on the associated stigma of being HIV positive by their healthcare providers.<sup>3, 5, 6</sup> These actions may lead to the provider denying services based on misconceptions of the HIV positive patient posing an immediate threat to others or to the provider.<sup>11, 12, 13</sup> Such actions may include double-gloving, declining to treat, executing sub-quality care, or referring their care to another facility despite having the necessary means for their treatment.<sup>11, 12</sup> One way to address these misconceptions is for dental hygiene educators to incorporate a knowledge base within their curriculum that includes education of HIV with particular emphasis on the ethical treatment of such patients, reinforcement of proper infection control practices and protocols, and integration of the etiology and epidemiology of the disease within their clinical lectures and practices.<sup>9, 11</sup>

### **Ethical Implications of Treating HIV/AIDS Patients**

The ethical implications of denying a patient care simply due to the prejudices of the dental care provider may have several consequences to both the patient and the

provider.<sup>12</sup> In order for a dental provider to deny services there first must be just cause.<sup>12</sup> For example, a justification of non-treatment may be that the services the provider would be rendering would pose a direct threat to the patient or others.<sup>12</sup> The provider would then need to justify that the patient's disability was too significant of a threat so much that even with the elimination by reasonable accommodation that the patient or others would still be threatened.<sup>12</sup> The provider cannot simply deny without first assessing and must not be in part to stigma associated with the condition; failure to provide reasonable means and justification could result in discrimination.<sup>12</sup> Therefore, there is no legal or ethical justification in denying services to patients that have HIV or AIDS that would otherwise be offered to persons that are non-HIV or AIDS positive.<sup>12</sup> Ethically, dental providers have a responsibility to treat and provide care to persons living with HIV and AIDS regardless of fears, attitudes, and general misconceptions.<sup>12</sup> Despite this responsibilities, several reasons remain as to why these individuals are often discriminated which include fear of infection, homophobia, and the belief that persons living with HIV OR AIDS are responsible for their illness.<sup>12</sup> To overcome such an ethical dilemma, dental hygiene schools must provide training that incorporates their state's code of ethics regarding treating such patients, discrimination policies, and ethical responsibilities.<sup>12</sup>

Other ethical implications to the treatment of this population is the autonomy, consent, confidentiality, and the incorporation of treatment modalities.<sup>8</sup> Dental providers are responsible for providing quality care that is consistent with each and every patient and are often responsible for the early detection of oral manifestations of systemic diseases.<sup>8</sup> Taking into consideration these responsibilities, patient consent must be completed. Additionally, autonomy based on the patient's voluntary authorization of

dental procedures as a result of the dental provider informing the patient of all relevant and pertinent information so as to allow the patient to make an informed decision about what care they are consenting.<sup>8</sup> This does not mean that they agree to the dental care provider's treatment plan but allows them the fundamental right to their right to decide, autonomy.<sup>8</sup> Ethically providers are still bound to provide care that is consistent with their diagnosis.<sup>8</sup> Providers are also obliged to uphold the patient's confidentiality utilizing a universal professional code of ethics.<sup>8</sup> These ethical principles are no different when treating patients that are HIV or AIDS positive but due to public interests in protection from such infectious diseases, there is an inherent conflict of interest.<sup>8</sup> Despite this conflict, this population has a right to privacy and deliberate breach of this confidential information constitutes an unlawful act.<sup>8</sup> Confidentiality may be broken if there is an ethical duty as outlined by the code of ethics that dental providers abide by.<sup>8</sup>

One clinical aspect that possesses both ethical and legal issues within a dental setting is the testing of patients for HIV.<sup>8</sup> Advances in rapid oral fluid tests have demonstrated the practical uses of such tests and by obtaining informed consents to such treatments shows potential to provide patient care that is consistent with furthering preventative measures and interprofessional relationships with the patient's other healthcare providers.<sup>8</sup> The ethical and legal implications is the development of changing current scopes of practices and roles of dental providers so as to provide such services.<sup>8</sup>

### **Incorporating Student Perceived Knowledge within a Dental Healthcare Program Curriculum**

Several previous studies have suggested that when HIV/AIDS related knowledge

is incorporated within the curriculum it has demonstrated improvements in the student's attitudes and behaviors towards treating such patients.<sup>11</sup> Other studies have suggested that when the knowledge was gained through previous experience in treating a variety of vulnerable populations to include those living with HIV or AIDS, the provider's attitudes improved and they had greater willingness to treat patients from within these populations.<sup>11</sup> On the other hand, when dental providers harbor negative attitudes towards their patients they may "provide them with suboptimal care" and the stigma that may be perpetuated by the dental provider may act as a barrier to treating patients with HIV or AIDS.<sup>15</sup> With these attitudes and trends concerning their improvement by educational endeavors, the question then arises whether or not current dental educational programs and their associated curriculums are preparing their students with the foundation to treat such patients and have the knowledge base to form such attitudes and behaviors consistent with providing dental care that is consistent with all populations.<sup>14</sup> Research suggests that instruction concerning treatment of at-risk and HIV/AIDS infected patients is limited to traditional lecture and during clinical setting infection controls and lacks the use of other instructional approaches.<sup>14</sup> It also suggests that increasing knowledge and maintaining appropriate infection control protocols, dental and dental hygiene students were still fearful of treating patients with systemic diseases and were less likely to desire treating such patients than their medical student counterparts.<sup>14</sup> These same attitudes and behaviors were also seen within their educational faculty members and such biases may hinder their ability to incorporate such education and teach their students to be less fearful and willing to treat such populations.<sup>14</sup> Students that studied under such biases "demonstrated these attitudes and behaviors themselves" when studying under "faculty

who have limiting attitudes and/or display these behaviors.”<sup>14</sup>

When surveying students’ attitudes towards treating persons living with HIV/AIDS the research conducted by Seacat, Inglehart, and Habil utilized such misconceptions and attitudes so as to assess the current attitudes of dental healthcare students and its future implications.<sup>14</sup> The study’s surveys concluded that the students did not feel that they received enough education and knowledge base and that their school’s curriculum lacked preparation to treat diverse patients and patients with communicable infectious diseases.<sup>14</sup> Though the students within this study increasingly felt more prepared to treat such patients as they progressed within their academic program, the students still failed to be knowledgeable on treating such patients.<sup>14</sup> This study, therefore, demonstrates the need to address current curriculums so as to address any areas of improvement and one such way is to incorporate the student’s perceived knowledge and attitudes towards such patients.<sup>14</sup> By incorporating such student concerns within their program’s curriculum, it allows for the faculty to adjust such educational aspects to reflect their student’s knowledge base. For the level at which the student is aware of treating such patients and the disease’s dental implications, allows for the direct translation into their patient care development and when students are not prepared, their inability to fully address the needs of their patients may pose potential risks for both the patient and the provider to include misdiagnoses and subpar dental care.<sup>14</sup> This incorporation also allows for further development of patient-centered care and other professional skill development other than clinical instructions due to the incorporation of awareness, skills, and knowledge outside of clinical instruction.<sup>14</sup> Dental healthcare academic programs that utilize their students’ input and collaboration to address

curriculum changes may help further advance their students' professional relationships with their program, their patients, and their community due to increasing the students' self-awareness, their personal values and commitments, and knowledge of ethical responsibilities and duties to their patients of all populations.<sup>14</sup>

### **HIV Healthcare Disparities and Increasing Community Efforts**

Current studies demonstrate that persons living with HIV suffer from healthcare disparities and efforts that have been made to help alleviate this vulnerability to their health are efforts that are community-based such as the use of dental care managers, utilization of academic clinics, and partnerships within the community, i.e. private and public care facilities.<sup>6,7</sup> Academic institutions and community-based public dental care facilities each provide a means for underserved populations to address their oral healthcare needs and their successful collaboration has been demonstrated to help decrease the disparities of access to care to this population.<sup>7</sup> With the integration of a dental care manager, already in place collaborations may have the ability to further decrease the current disparities not only within the population but on an individual level by addressing the individual patient's needs.<sup>6,7</sup> Dental care managers act similar to medical case managers but have a primary function of addressing the patient's oral healthcare through acting as a bridge between the patient and their care provider in order to reduce the patient's unmet needs, continue their oral care maintenance, and expand their dental services available to them.<sup>6</sup>

Community efforts currently in place allows for the possibility of an integration of a multidisciplinary approach to the care of this population.<sup>7</sup> One such procedure that has

the potential to further develop this multidisciplinary approach to care is the integration of an in-office HIV testing of at-risk individuals, and other individuals seeking such testing, within the dental care setting.<sup>8,9,10</sup> It is estimated that of the 1.2 million persons that are HIV positive of which 168,300 are unaware of their positive status which emphasizes the need for early diagnosis and treatment so as to potentially decrease the risks of complications associated with this condition such as oral malignancies.<sup>4,5,10</sup> This procedure may be done during the patient's comprehensive oral exam using a rapid oral HIV test technology that provides for an inexpensive, simple, minimally invasive, and sensitive results.<sup>9,10</sup> This would also allow for the dentist to play a critical role in their healthcare by referring the patient who tests positive for HIV to their healthcare provider and help in the differential diagnosis of early manifestations of the disease as often first noted within the oral cavity.<sup>8,9,10</sup>

Studies have been conducted to evaluate and determine barriers that patients living with HIV face, such as those of the attitudes and knowledge of HIV amongst dental care providers and other healthcare providers and community-based efforts to help bridge the disparities amongst care provide a basis of the understanding of how to approach this multidimensional disease.<sup>7,11</sup> With HIV and AIDS demographics shifting and the number of individuals living with the diseases increasing due to improvements in quality and quantity of life expectance, continued efforts and research are needed to determine factors that may improve dental provider comfort and willingness to treat, and participate in community-based options to treat this population.<sup>7,11,14</sup>

## **CHAPTER III**

### **METHODS AND MATERIALS**

#### **Introduction**

This descriptive research will be focusing on the perceived knowledge and attitudes of junior and senior dental hygiene students towards treating patients with HIV or AIDS. Previous studies have demonstrated raised concerns about the ability of healthcare providers to recognize manifestations of this disease and as to whether or not misconceptions about the etiology and epidemiology of the disease have increased negative attitudes towards treating this population. By utilizing surveys, this study aims to indicate student attitudes and concerns so as to provide a basis for academic recommendations.

#### **Hypotheses**

Does the time of instruction received within a dental hygiene program and preparedness have an effect on the students' perceived knowledge and level of confidence in treating patients living with HIV? Are personal fears a contributing factor in their level of confidence and willingness to treat this population?

The null hypotheses are that there will be no significant relationships demonstrated between tested variables. There is no difference between each tested variable.

#### **Sample and Design**

A self-administered survey will be used as to access the attitudes, perceived general knowledge of HIV and accompanying oral manifestations, and general concerns a dental hygiene student may have towards treating individuals who have HIV. The intended population for this study will be dental hygiene students attending accredited dental hygiene programs within the United States.

Each survey will contain questions about whether they have treated this population and polar and dichotomous questions with varying contingency questions. This will allow for personal interpretation through qualitative and quantitative analysis representations. The survey will ask the participants to answer the following demographic questions: their age, sex, year in school, and program degree level. Questions such as “Do you think this population faces barriers to oral care? Do you feel that patients do not divulge their status due to their fears of discrimination to care?” so as to ascertain their knowledge of treatment barriers. Inquiring about their school’s protocols for treatment, their experience with treating this population, and associated attitudes will be used to assess their clinical knowledge and concerns. Questions such as “Do you feel that your dental hygiene program has adequately prepared you to treat this population?” and inquiring if certain teaching methods would increase their clinical confidence will be used to assess their didactic knowledge and make further recommendations to curriculum involvement. Each survey and projected data analysis methods will be consulted with by a local statistician, preferably a graduate student within the University of New Mexico Department of Mathematics and Statistics.

The initial phase of surveying will consist of assessing how many dental hygiene programs are within the United States and obtaining their contact information. Once this

information has been assessed, program directors will be contacted through email and asked if they are willing to be part of the survey process and if so, have them forward survey information to their respective student class email listserv. Each email to the program directors will include the website link to the survey, the purpose of the study, the extent of the study, and contact information.

Once the surveys have been completed, the data will be analyzed. Each of the surveys answers will be placed within their corresponding similar answers. These categories will be further analyzed and stratified based on their corresponding percentages. The report will include the regions' statistical information and will be compared to the data as a whole. This information will also be assessed by a local statistician for its accuracy and reliability of the data obtained.

### **Data Collection**

Survey links and pertinent information will be emailed to the program directors so they may forward the survey to their respective student email listserv. Surveys will be in electronic format using the online software service Survey Monkey to format and collect data. By participating and completing the survey, the dental hygiene student participant gives their informed consent. Once all surveys have been completed within a reasonable set of time, a maximum of thirty days once the program directors have received and forward the study, the surveys will be assessed.

### **Data Analysis**

After the surveys are collected, the questions and their corresponding answers will

be categorized based on the frequency of respondents selecting each of the available answers. Each frequency will be further assessed via measures of dispersion so as to demonstrate the relative frequency of each answer. So as to determine a relationship, a p value of lesser than or equal to 0.05 will be used to determine whether a relationship exists between the students' perceived knowledge and confidence levels with the level of education regarding persons living with HIV or AIDS. A chi-square test will be used to analyze their corresponding relationships. So as to prove its true value towards generalizing to the general population, a confidence level of 95 percent of correlating interval will be used to demonstrate such a generalization.

## CHAPTER IV

### RESULTS, DISCUSSION, AND CONCLUSION

#### Results

The recruitment email, website link to the survey, and other pertinent forms was sent to 325 dental hygiene programs. A total of 158 responses were collected via the online survey website. All the surveys were filtered for inconsistent and incomplete answers. Once completed, a total of 90 responses were analyzed. Forty-seven Associates and forty-three Baccalaureate students consisting of sixty-three seniors and twenty-seven juniors were included in the survey analysis. Age and sex were not taken into account during analysis partly due to a significant number of students reporting their age to be less than thirty years and only two male respondents.

The descriptive responses were analyzed based upon the respondents' program level. The following were observed:

- Fifty-nine and sixty-seven percent of juniors and seniors, respectively, had HIV etiology and epidemiology incorporated within their pre-requisite work. Of this, Sixty-three and fifty percent of juniors and seniors, respectively, had two to four hours of dedication.
- Fifty-six and fifty-nine percent of juniors and seniors, respectively, agreed or strongly agreed that this population had barriers to oral care (Figure 1).
- Seventy-four and seventy-two percent of juniors and seniors, respectively, agreed or strongly agreed that this population does not divulge their status due to fears (Figure 1).

- Seventy and eighty-five percent of juniors and seniors, respectively, were aware or very aware that this population has increased risk for dental conditions (Figure 1).
- Fifty-five and eighty-five percent of juniors and seniors, respectively, were aware or very aware of this population having an increased risk for oral manifestations (Figure 1).

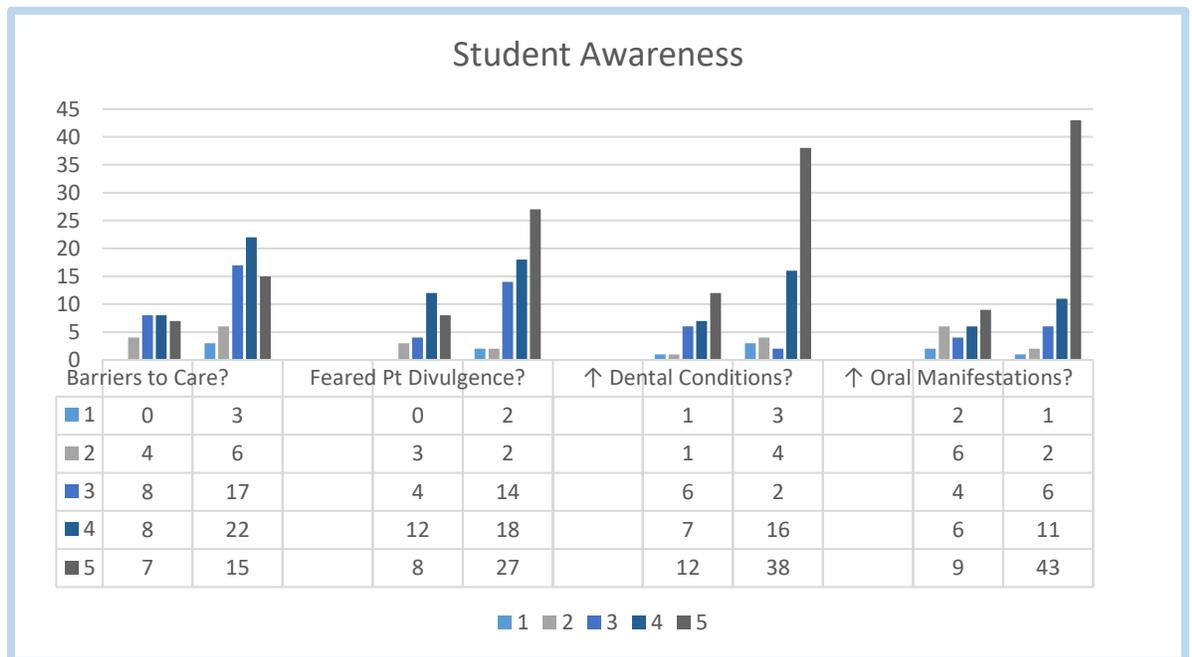


Figure 1: Student awareness of HIV dental and oral manifestations.

- Seventy and fifty-two percent of juniors and seniors, respectively, reported that their school having a specific protocol for treating this population.
- 100 and eighty-four percent of juniors and seniors, respectively, reported having not treated a patient that reported being HIV positive. Of those whom answered

yes, eighty percent said they were comfortable treating the patient. Of those that answered no, forty-four and thirty-two of juniors and seniors, respectively, would be comfortable treating this population.

- Eighty-one and eighty-five percent of juniors and seniors, respectively, agreed or strongly agreed that current universal protective measures were sufficient.

However, thirty-seven and forty-two percent of juniors and seniors, respectively, agreed or strongly agreed that they preferred to utilize special measures to treat this population.

- Eighty-six and sixty-seven percent of juniors and seniors, respectively, reported having HIV education incorporated within their program. Thirty-three and fourteen percent of juniors and seniors, respectively reported no incorporation. Of those whom reported that there was no dedicated coursework, eleven and thirty-three percent of juniors and seniors, respectively, felt prepared enough to treat this population. Overall, seventy-four and seventy-one percent felt their dental hygiene program prepared them enough to treat this population (Figure 2).

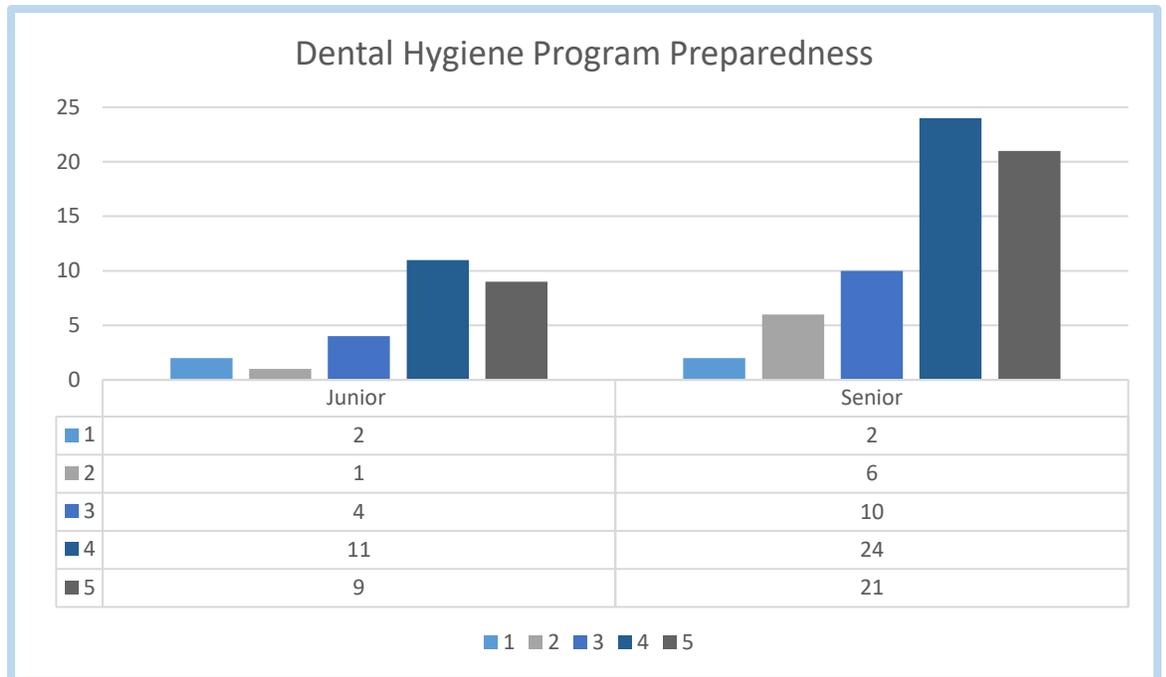


Figure 2: Student perceived program preparedness.

- Sixty-seven and eighty-six percent of juniors and seniors, respectively, reported their program incorporated HIV and its treatment modifications within their dental hygiene program. Of which, fifty and fifty-two percent of juniors and seniors, respectively, reporting that there was two to four hours of dedication.
- Twenty-six and thirty-three percent of juniors and seniors, respectively, felt comfortable working in a clinic that specialized in treating this population (Figure 3).

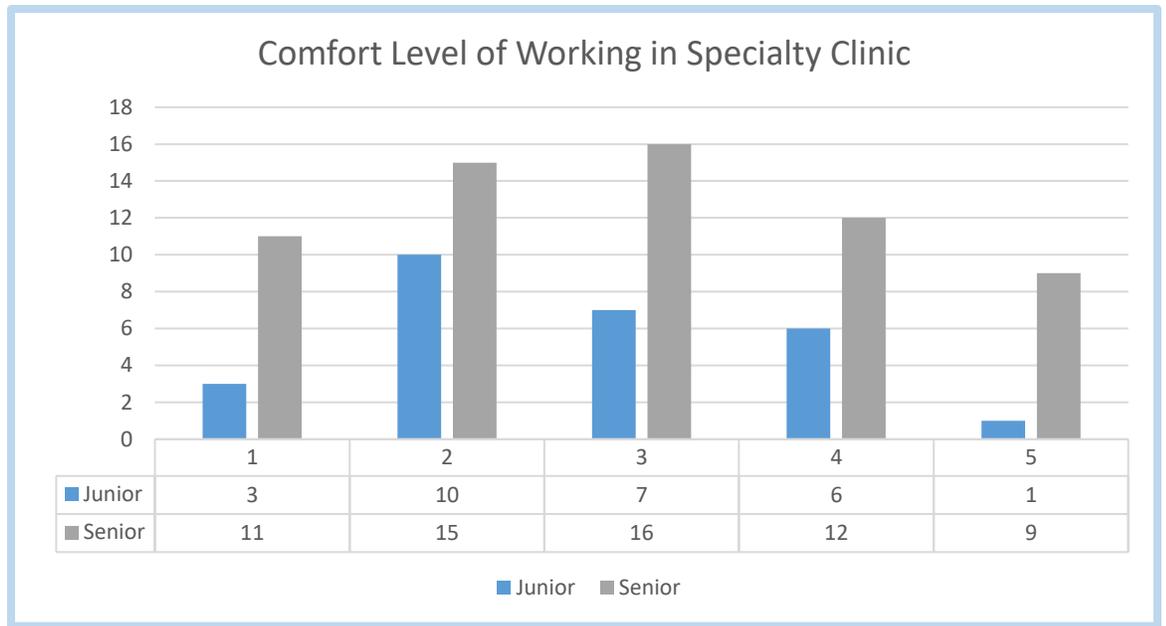


Figure 3: Student comfort level in treating patients in an HIV specialty clinic.

- Forty-eight and thirty-three percent of juniors and seniors, respectively, agreed or strongly agreed that meeting a person living with HIV would increase their confidence.
- Fifty-six and thirty-six percent of juniors and seniors, respectively, agreed or strongly agreed that incorporating more case studies would increase their confidence.
- Thirty-eight and thirty percent of juniors and seniors, respectively, agreed or strongly agreed that increasing allotted time within didactic courses would increase their confidence.

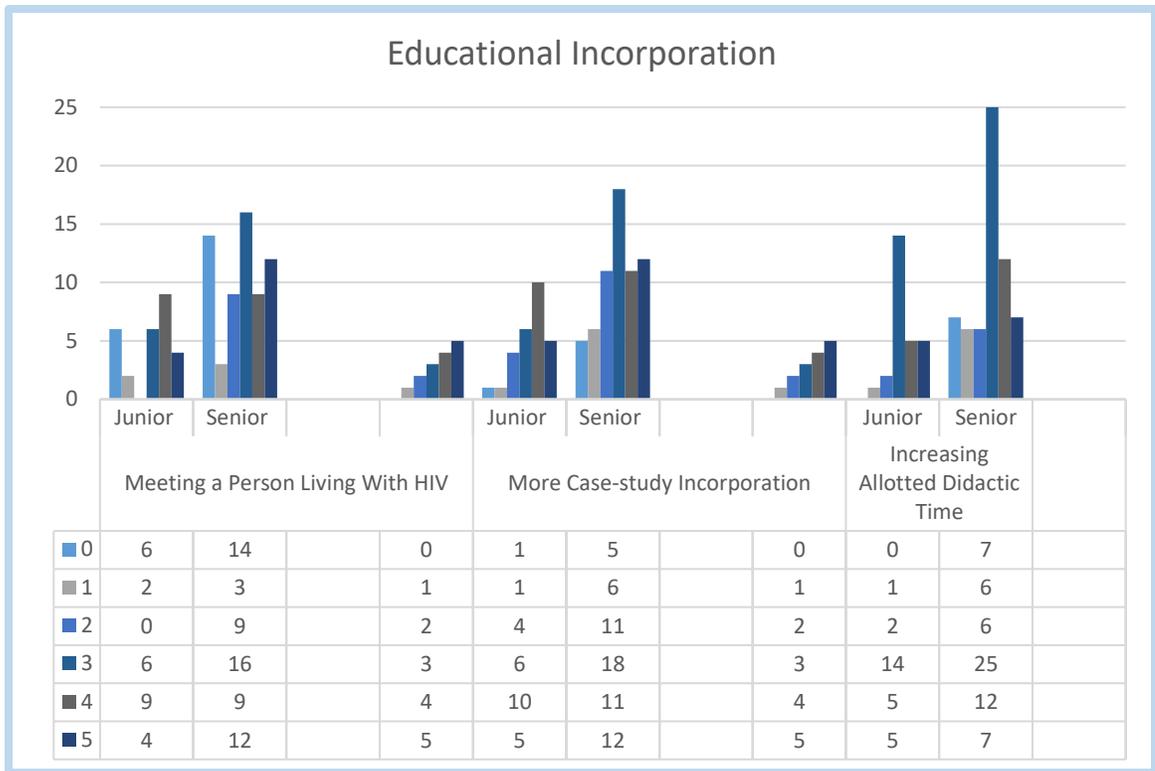


Figure 4: Student perceptions of adding educational measures.

During analyses, a p value of 0.05 with a confidence of 95% was used to generate a corresponding relationship. The appropriate degrees of freedom values were used with each corresponding p value. The during chi-square test analysis, the following associations were demonstrated (Table 1):

- When time of instruction (x) was tested for an association with awareness of dental conditions (y) there was a significant relationship between the two variables. The null hypothesis that there is no relationship between time of instruction and awareness of dental conditions was rejected. The chi-square= 27.21375 and df=12.
- When time of instruction (x) was tested for an association with the awareness of

oral manifestations, there was not a significant relationship between the two variables. Failed to reject the null hypothesis. The chi-square=19.363 and df=12.

- When time of instruction (x) tested for an association with the average of clinical awareness (dental and oral manifestations, y), there was not a significant relationship between the two variables. Failed to reject the null hypothesis. The chi-square=5.965976 and df=12.
- When time of instruction (x) was tested for an association with program preparedness (y), there was a significant relationship between the two variables. The null hypothesis that there is no significant relationship between time of instruction and program preparedness was rejected. The chi-square=35.1657 and df=12.
- When program level (x) was tested for an association with the average of clinical awareness (y) there was not a significant relationship between the two variables. Failed to reject the null hypothesis. The chi-square= 5.308899 and df=4.
- When program preparedness (x) was tested for an association with comfort level of working in a specialty clinic (y), there was a significant relationship between the two variables. The null hypothesis that there is no significant relationship between program preparedness and comfort level of working in a specialty clinic was rejected. The chi-square=36.48515 and df=16.
- When the program level (x) was tested for an association with level of program preparedness (y), there was not a significant relationship between the two variables. Failed to reject the null hypothesis. The chi-square= 5.3088 and df=4.

- When comfort level of current universal PPE precautions (x) was tested for an association with increasing PPE (y) there was a significant relationship between the two variables. The null hypothesis that there is no significant relationship between comfort level of current universal PPE precautions and increasing PPE was rejected. The chi-square=63.0296 and df=16.

<b>Chi-Square Analysis</b>				
<b>Survey Questions</b>	<b>Chi-Square</b>	<b>Degrees of Freedom</b>	<b>Chi-Square Critical Value</b>	<b>P-Value</b>
<b>Instruction (x), Dental Awareness (y)</b>	27.21375	12	21.03	0.05
<b>Instruction (x), Manifestations Awareness (y)</b>	19.363	12	21.03	0.05
<b>Instruction (x), Average Clinical Awareness(y)</b>	5.96976	12	21.03	0.05
<b>Instruction (x), Program Preparedness (y)</b>	35.1657	12	21.03	0.05
<b>Program Level (x), Average Clinical Awareness (y)</b>	5.308899	4	9.49	0.05
<b>Program Preparedness (x), Comfort Level (y)</b>	36.48515	16	26.3	0.05
<b>Program Level (x), Program Preparedness (y)</b>	5.3088	4	9.49	0.05
<b>Comfort Current PPE (X), Increasing PPE (Y)</b>	63.0296	16	26.3	0.05

Table 1: P Value Analysis

### **Summary of Results**

After the collection period, a total of 158 survey responses was collected. Each survey was filtered based on their completion. Surveys with incomplete or inconsistent answers, for example multiple answers selected within a single question, were filtered

out. Once completed, a total of 90 responses remained. The analysis focused on the differences and corresponding relationships between junior and senior program levels.

Time of instruction was divided between pre-requisite and dedicated didactic time within their dental hygiene program. More than half of juniors and seniors reported having had dedicated pre-requisite course work that incorporated HIV etiology and epidemiology with at least half having two to four hours of dedicated time. Over sixty percent of each program level also reported that their dental hygiene program incorporated HIV and its dental treatment modifications and concerns within their course work. Of this, more than half of each level reported having two to four hours of dedicated didactic time. Taking these descriptive analyses into account, when time of instruction was analyzed with certain criteria, relationships were demonstrated. The amount of time dedicated within their respective dental hygiene program significantly related with their perceived knowledge of increased dental conditions but did not have an effect on their knowledge of increased oral manifestations nor the individual respondent's average of perceived knowledge. The average of perceived knowledge, also, showed no significant relationship when associated with program level. This lack of association may be dependent on several factors to include the content they were presented and individual interpretations of this presented material.

Clinical prejudices that were surveyed were their views of possible factors of patients not divulging their status to clinicians, their various comfort levels, and willingness to work within a specialty clinic. Over seventy percent of each program level agreed that patients feared repercussions and discrimination when they divulged their status to clinicians leading them to not disclose their status. Over sixty-five percent of

each program level stated they felt that current universal personal protective measures were sufficient but over thirty percent still felt they would prefer to utilize special precautions when treating this population. Analysis demonstrated that there was a significant relationship between comfort level of current protective measures with using special precautions. Only the senior program level reported having seen a patient with this disease, of which eighty percent felt comfortable treating the patient. Of those students that reported not having treated a patient with the disease, over 30 percent of each program level stated they would feel comfortable treating a patient with HIV. Overall, over twenty-five percent felt comfortable working in a specialty clinic that specialized in treating this population. Analysis demonstrated that there was a significant relationship between whether students felt their program prepared them enough to treat this population with their comfort level of working in a specialty clinic.

Participants were questioned as to whether or not the following educational scenarios would increase their confidence levels: meeting a person living with HIV in a classroom setting; more case-study incorporation focusing on this population; and increasing time allotted in didactic courses to cover the related material. Forty-eight percent of junior levels and thirty-three percent of senior levels stated that meeting a person would have an effect on their confidence levels. Fifty-six percent of junior levels and thirty-six percent of senior levels stated that more case studies would increase their confidence levels. Thirty-eight percent of junior levels and thirty percent of senior levels stated that increasing didactic time would increase their confidence levels. Of these educational incorporations, junior levels reported slightly higher percentages of impact to their confidence level.

## **Limitations**

This survey was limited to studying the views and perceptions of dental hygiene student providers. In order to generalize the results of this survey to those already practicing dental hygiene providers, future studies would need to be developed.

When assessing their opinions of incorporating various educational modalities to increase their confidence, no true relationships could be determined. In order to demonstrate a true relationship of these modalities, future studies will need to be designed so as to generate such results. This could be done using pre-test and post-test surveillance.

The design of the study utilized program directors to help facilitate the distribution of the survey to their students. The distribution, therefore, was relied on the discretion of the program director to forward the survey. There were also instances where the contact information was not up-to-date and therefore, some programs and their prospective student participants did not have the full thirty days to complete the survey. A total of six email contacts could not be reached due to school closure or the email was rejected due to their mailbox settings.

Only the filtered data was analyzed. Those respondents that were part of the original data did not have any of their completed survey questions analyzed. Adding them to the data may or may not have had an impact on the resulting data and its corresponding analysis.

Of the filtered data, age and sex were not analyzed as a contributing factor within the data analysis due in part to lack of varying data. Most respondents had similar age

ranges and were mainly female (eighty-eight). Future studies wanting to incorporate these demographics should be designed so as to reach these specific demographics.

The data was limited to establishing association and is not prospective regression, due in part, to the data being categorical not nominal. To establish this correlating and predictive data, future studies may be designed so as to include nominal data.

## **Conclusion**

There was a significant relationship amongst time of instruction with awareness of dental conditions and preparedness, program preparedness with comfort level, and comfort with current PPE and preference to special precautions. These relationships demonstrated that the time of instruction and the course content do have an effect on the students' awareness of increased dental conditions, their comfort levels in treating this population, and their comfort with using current precautions.

There was not a significant relationship amongst program level with preparedness, time of instruction with awareness of oral manifestations, and time of instruction with average of awareness. The lack of association may be in part to the content to which the dental hygiene program focuses when incorporating HIV education within their curriculum. Since there is a significant relationship between awareness of dental conditions, this may imply that the program focuses on dental implications. This can also be the reasoning as to why the average scores of both awareness criteria also wielded no association. The lack of association between program level and preparedness may be due to educational inconsistencies within the curriculum such as dedicated times

may vary from level to level. The inconsistencies may also be due to variances amongst dental programs and their corresponding curriculums.

Program levels reported having varying agreement as to whether or not incorporation of educational modalities would increase their confidence levels. The junior program levels were slightly more receptive to educational modalities being incorporated than senior levels. This may be due to their lack of clinical and didactic experience within their program and inconsistent curriculum dedication. Individual interpretations of their current skills, perceived knowledge, and educational preferences may have influenced their responses but not necessarily demonstrate a true relationship of increasing their confidence.

**CHAPTER V**

**ARTICLE FOR SUBMISSION**

**TITLE PAGE:**

**Importance and Value of HIV Education Amongst Dental Hygiene Student  
Providers**

**Shawndell L. Bowers**

University of New Mexico

Sbowers03@salud.unm.edu

(505)615-5189

Key words: HIV, dental hygiene, education

## **ABSTRACT**

**Objectives:** The purpose of this study was to demonstrate whether dental hygiene student providers demonstrated general knowledge of dental implications of HIV, whether or not they felt confident with their program preparedness and clinical treatment of this population, and whether or not they had prejudices reflecting current clinical aspects. They were also assessed for their perceptions of incorporating several educational modalities so as to increase their confidence levels.

**Methods:** A survey was used to collect the perceived knowledge, confidence levels, clinical implications, and possible prejudices dental hygiene student providers may have towards treating individuals that have HIV. Descriptive statistics were used for all inquiries and statistical significance was determined using chi-square tests.

**Results:** A total of 90 filtered surveys were analyzed. Descriptive analysis demonstrated various educational interpretations of survey data. Significance testing determined relationships amongst various tested associations revealing p-value results greater than alpha at 0.05.

**Conclusion:** There was a significant relationship amongst time of instruction with awareness of dental conditions and preparedness, program preparedness with comfort level, and comfort with current PPE and preference to special precautions. There was not a significant relationship amongst program level with preparedness and average of awareness and time of instruction with awareness of oral manifestations and with average of awareness. Program levels reported having varying agreement as to whether or not incorporation of educational modalities would increase their confidence levels.

## **CLINICAL RELEVENCE**

The role of the dental hygienist in the care of HIV patients is to be able to see changes within their oral cavity, be knowledgeable about the disease, and be a willing participant in their care in order to retain their oral health status. These concepts are developed within their educational program and therefore, it is imperative to assess student perceived knowledge, confidence and comfort levels, and possible prejudices they may have a student provider so as to develop further studies that may change educational and clinical aspects related to HIV education and treatment modifications.

### **Introduction**

In the United States there is an estimated 1.2 million persons living with HIV. Approximately 168, 300 (1 in 8 cases) are unaware of their infection and the estimated number of approximately 50,000 newly infected persons per year has remained relatively stable over the past decade.<sup>4</sup> There is no cure for HIV and therefore, requires life-long treatments.

HIV may manifest itself within the oral cavity.<sup>2</sup> Such manifestations are partly due to related immunosuppression, behavior of the disease, the therapy modalities being employed, and the individual's genetic variation.<sup>25</sup> Individuals who are HIV positive are also at a higher risk for caries, periodontal disease, and xerostomia and therefore, it is imperative for the patient to continue to receive routine dental care in order to maintain their oral healthcare. Thus, the role of the dental hygienist in the care of the HIV positive patient is to be able to see changes within the oral cavity that would suggest further treatment and referral, be knowledgeable about the disease, and be a willing participant in their care in order for the patient to retain their care and oral health status.<sup>2,5</sup>

In order to provide the necessary treatment modalities, dental hygiene providers must first possess an understanding and comprehension of the disease's etiology and epidemiology.<sup>6</sup> This preparation is then partly the responsibility of the dental hygiene educational program to provide adequate time and resources within their respective curriculum and clinical settings to provide their students the opportunity to treat the HIV population.<sup>6</sup> Educating students within a clinical setting and applying patient-centered care is a complex process and when clinical knowledge lacks awareness, skills, and knowledge of systemic diseases such as HIV, the dental care provider's treatment plan is limited, lacks quality, and potentially risks the patient's overall health.<sup>6</sup> Having a sufficient and diverse educational background, is therefore, imperative to provide comprehensive treatment that is of the upmost quality within all populations.

### **Study population and methodology**

The sample consisted of currently enrolled junior and senior program level students within accredited dental hygiene programs across the United States. A total of 332 entry level program directors was contacted through email address found on the American Dental Hygiene Association's website and asked to forward survey information to their respective student class email listserv. Each email included the website link to the survey, an approved copy of the informed consent, the purpose of the study, the extent of the study, and contact information. The study was opened for thirty days from initial contact attempts.

The survey consisted of various polar and dichotomous questions with varying contingency questions so as to evaluate the perceived knowledge, confidence levels, clinical implications, and possible prejudices dental hygiene student providers may have

towards treating individuals that have HIV.

After the surveys were collected, the questions and their corresponding answers were assessed to determine whether a relationship exists between program levels and time of instruction with perceived knowledge, student prejudices, and confidence levels. Descriptive statistics were used for all inquiries and statistical significance was determined using chi-square tests with a p-value=0.05.

## **Results**

The recruitment email, website link to the survey, and other pertinent forms was sent to 325 dental hygiene programs. A total of 158 responses were collected via the online survey website. All the surveys were filtered for inconsistent and incomplete answers. Once completed, a total of 90 responses were analyzed. Forty-seven Associates and forty-three Baccalaureate students consisting of sixty-three seniors and twenty-seven juniors were included in the survey analysis. Age and sex were not taken into account during analysis partly due to a significant number of students reporting their age to be less than thirty years and only two male respondents.

When analyzing student preparedness, most students were aware of dental implications and had dedicated time either in prerequisite work or within their respective dental hygiene program. Fifty-nine and sixty-seven percent of juniors and seniors, respectively, had HIV etiology and epidemiology incorporated within their pre-requisite work. Of this, Sixty-three and fifty percent of juniors and seniors, respectively, had two to four hours of dedication. Fifty-six and fifty-nine percent of juniors and seniors, respectively, agreed or strongly agreed that this population had barriers to oral care (Figure 1). Seventy-four and seventy-two percent of juniors and seniors, respectively,

agreed or strongly agreed that this population does not divulge their status due to fears (Figure 1). Seventy and eighty-five percent of juniors and seniors, respectively, were aware or very aware that this population has increased risk for dental conditions (Figure 1).

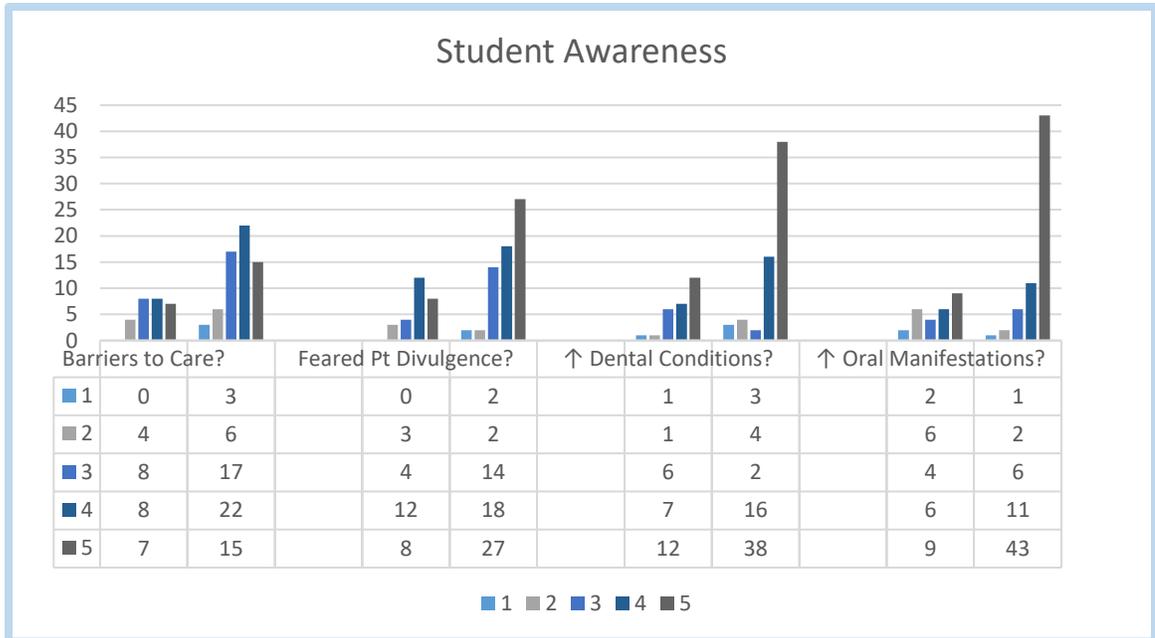


Figure 1: Student awareness of HIV dental and oral manifestations.

Most participants reported having a specific treatment protocol within their respective dental hygiene programs and had varying levels of confidence and preparedness in treating this population. Seventy and fifty-two percent of juniors and seniors, respectively, reported that their school having a specific protocol for treating this population. 100 and eighty-four percent of juniors and seniors, respectively, reported not having treated a patient that reported being HIV positive. Of those whom answered yes,

eighty percent said they were comfortable treating the patient. Of those that answered no, forty-four and thirty-two of juniors and seniors, respectively, would be comfortable treating this population. Eighty-one and eighty-five percent of juniors and seniors, respectively, agreed or strongly agreed that current universal protective measures were sufficient. However, thirty-seven and forty-two percent of juniors and seniors, respectively, agreed or strongly agreed that they preferred to utilize special measures to treat this population. Of those whom reported that there was no dedicated coursework, eleven and thirty-three percent of juniors and seniors, respectively, felt prepared enough to treat this population. Overall, seventy-four and seventy-one percent felt their dental hygiene program prepared them enough to treat this population (Figure 2). Twenty-six and thirty-three percent of juniors and seniors, respectively, felt comfortable working in a clinic that specialized in treating this population (Figure 3).

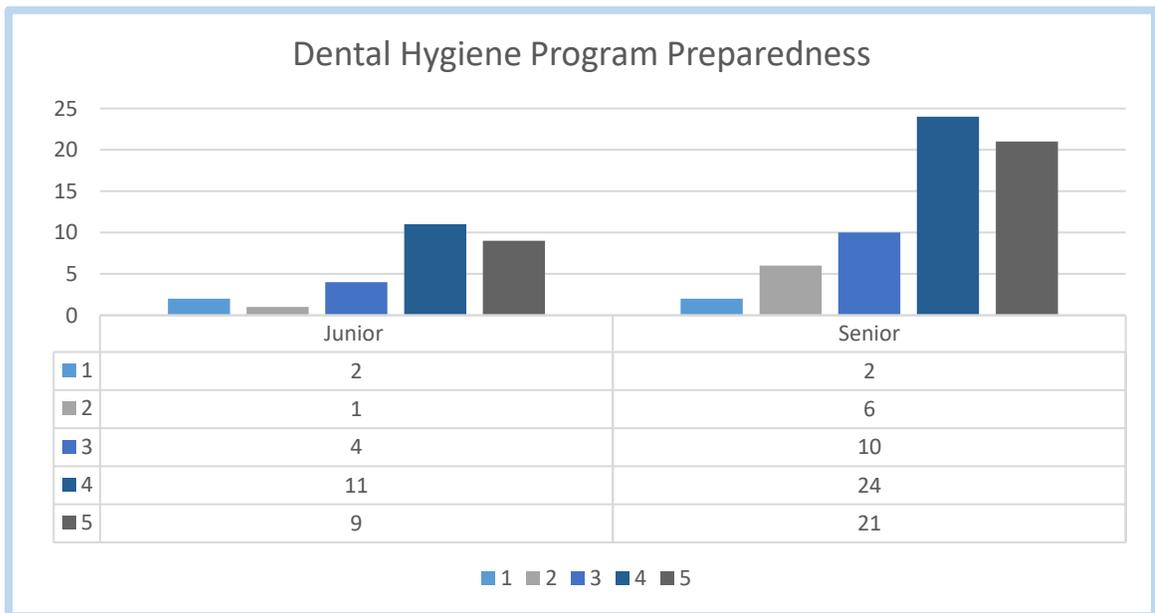


Figure 2: Student perceived program preparedness

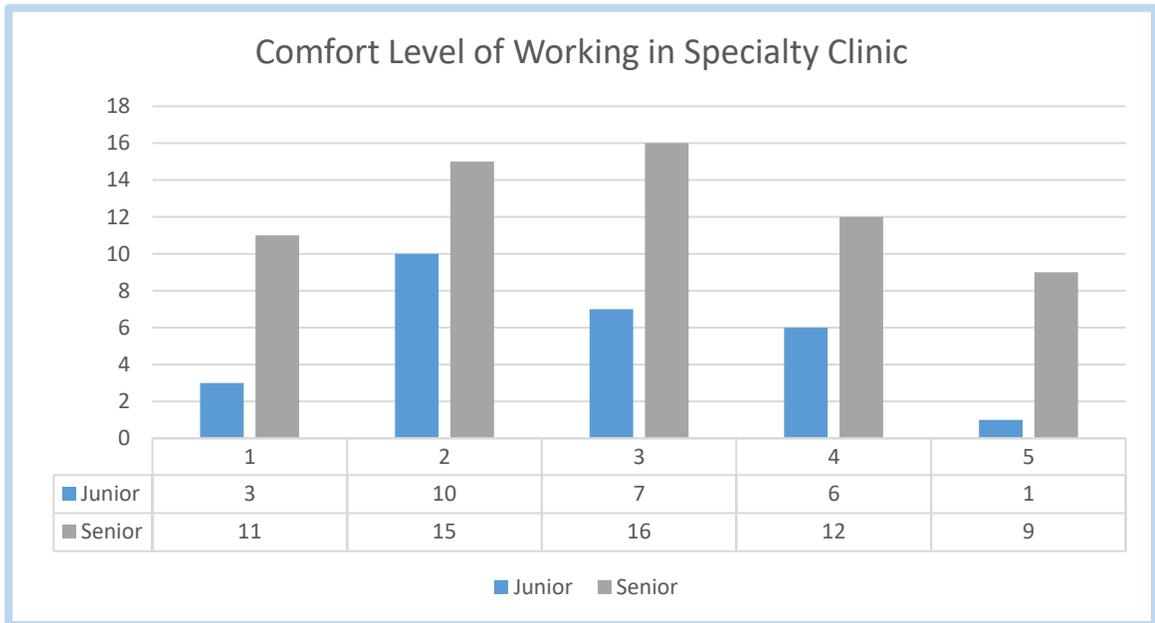


Figure 3: Student comfort level in treating patients in an HIV specialty clinic.

Sixty-seven and eighty-six percent of juniors and seniors, respectively, reported their program incorporated HIV and its treatment modifications within their dental hygiene program. Of which, fifty and fifty-two percent of juniors and seniors, respectively, reporting that there was two to four hours of dedication. When asked respondents were surveyed about their individual perceptions of adding certain educational modalities, observed results were inconsistent between program levels. Forty-eight and thirty-three percent of juniors and seniors, respectively, agreed or strongly agreed that meeting a person living with HIV would increase their confidence. Fifty-six and thirty-six percent of juniors and seniors, respectively, agreed or strongly agreed that incorporating more case studies would increase their confidence. Thirty-eight and thirty percent of juniors and seniors, respectively, agreed or strongly agreed that

increasing allotted time within didactic courses would increase their confidence.

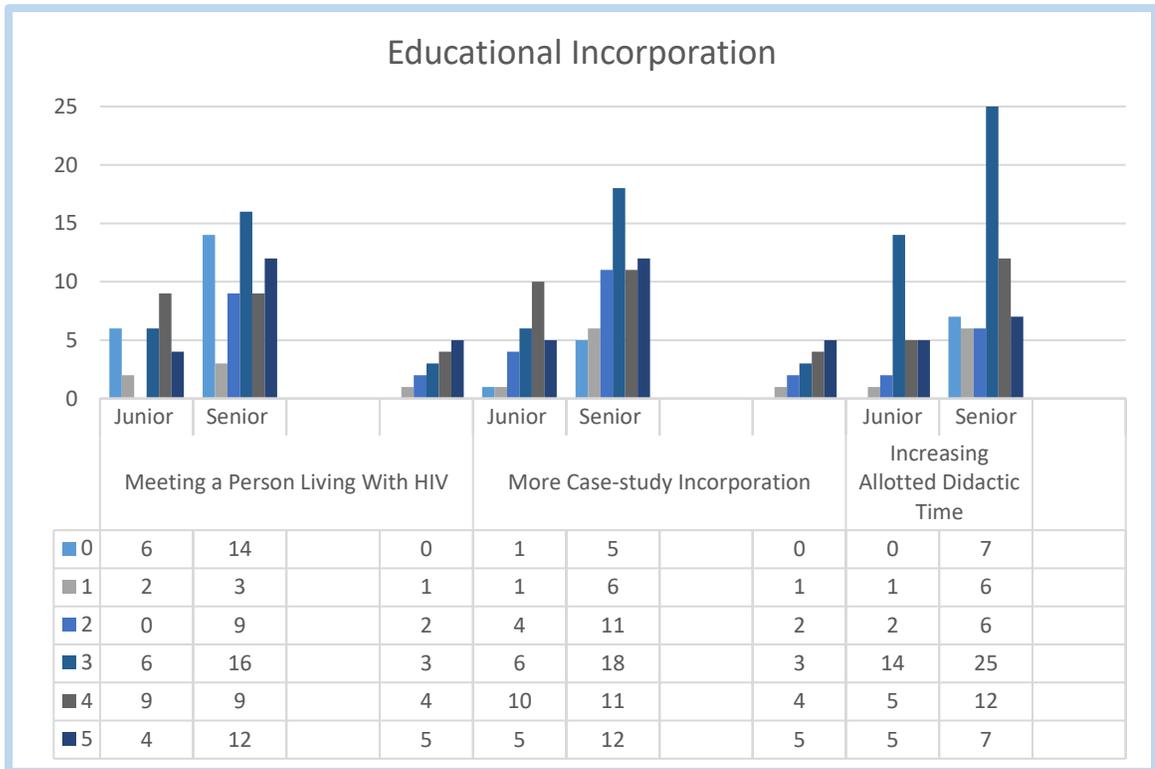


Figure 4: Student perceptions of adding educational measures.

During analyses, a p value of 0.05 with a confidence of 95% was used to generate a corresponding relationship. The appropriate degrees of freedom values were used with each corresponding p value during chi-square test analyses (Table 1).

When time of instruction (x) was tested for an association with awareness of dental conditions (y) and program preparedness each demonstrated significant relationships. On the other hand, when time of instruction (x) was tested for an association with the awareness of oral manifestations and with the average of clinical awareness (dental and oral manifestations) there were no significant relationships.

When program level (x) was tested for an association with the average of clinical awareness (y) and level of program preparedness, there were no established significant relationships. The chi-square= 5.308899 and df=4. There was an established significant relationship when program preparedness (x) was tested for an association with comfort level of working in a specialty clinic (y). When comfort level of current universal PPE precautions (x) was tested for an association with increasing PPE (y) there was a significant relationship.

<b>Chi-Square Analysis</b>				
<b>Survey Questions</b>	<b>Chi-Square</b>	<b>Degrees of Freedom</b>	<b>Chi-Square Critical Value</b>	<b>P-Value</b>
<b>Instruction (x), Dental Awareness (y)</b>	27.21375	12	21.03	0.05
<b>Instruction (x), Manifestations Awareness (y)</b>	19.363	12	21.03	0.05
<b>Instruction (x), Average Clinical Awareness(y)</b>	5.96976	12	21.03	0.05
<b>Instruction (x), Program Preparedness (y)</b>	35.1657	12	21.03	0.05
<b>Program Level (x), Average Clinical Awareness (y)</b>	5.308899	4	9.49	0.05
<b>Program Preparedness (x), Comfort Level (y)</b>	36.48515	16	26.3	0.05
<b>Program Level (x), Program Preparedness (y)</b>	5.3088	4	9.49	0.05
<b>Comfort Current PPE (X), Increasing PPE (Y)</b>	63.0296	16	26.3	0.05

Table 1: P Value Analysis

## **Discussion**

There was a significant relationship amongst time of instruction with awareness of dental conditions and preparedness, program preparedness with comfort level, and

comfort with current PPE and preference to special precautions. These relationships demonstrated that the time of instruction and the course content do have an effect on the students' awareness of increased dental conditions, their comfort levels in treating this population, and their comfort with using current precautions.

Persons living with HIV or AIDS are at a higher risk for developing caries, periodontal disease, oral lesions, and xerostomia.<sup>3</sup> When preventive services are utilized the maintenance and improvement of this population's oral health has shown to reduce the risk of oral disease and prevent the progression of existing diseases to include decreased caries risk, improved periodontal health, and increased retention of existing teeth.<sup>3</sup> This increased care also may lead to the reduction of dental pain and discomfort while improving their ability to "eat, speak, and socialize."<sup>3</sup> Therefore, due to the numerous oral implications of HIV and AIDS, it is imperative that persons living with HIV or AIDS have an appropriate knowledge base and practices of home and professional oral care.<sup>13</sup> Several studies have shown that with increasingly poor oral hygiene this population's risk for oral complications also increases and may result in other aspects of their health to suffer.<sup>13</sup> Regarding current home care practices of HIV-positive patients, one study showed that since their diagnosis only 26 percent reported daily flossing, 34 percent reported brushing and flossing more often, 23 percent reported seeing a dentist less frequently, and 11 percent reported never doing self-examinations within the oral cavity.<sup>13</sup> These inconsistencies shed light on the importance of dental providers incorporating oral hygiene instruction within their dental hygiene care plan while taking into consideration their attitudes and knowledge of oral healthcare.<sup>13</sup>

There was not a significant relationship amongst program level with

preparedness, time of instruction with awareness of oral manifestations, and time of instruction with average of awareness. The lack of association may be in part to the content to which the dental hygiene program focuses when incorporating HIV education within their curriculum. Since there is a significant relationship between awareness of dental conditions, this may imply that the program focuses on dental implications. This can also be the reasoning as to why the average scores of both awareness criteria also yielded no association. The lack of association between program level and preparedness may be due to educational inconsistencies within the curriculum such as dedicated times may vary from level to level. The inconsistencies may also be due to variances amongst dental programs and their corresponding curriculums.

Patients that are HIV positive have a higher risk of oral conditions that are known to significantly compromise their oral and overall health.<sup>2, 6, 13</sup> Despite this higher risk, there is evidence that suggests that there are barriers to their care based on the associated stigma of being HIV positive by their healthcare providers.<sup>3, 5, 6</sup> These actions may lead to the provider denying services based on misconceptions of the HIV positive patient posing an immediate threat to others or to the provider.<sup>11, 12, 13</sup> Such actions may include double-gloving, declining to treat, executing sub-quality care, or referring their care to another facility despite having the necessary means for their treatment.<sup>11, 12</sup> One way to address these misconceptions is for dental hygiene educators to incorporate a knowledge base within their curriculum that includes education of HIV with particular emphasis on the ethical treatment of such patients, reinforcement of proper infection control practices and protocols, and integration of the etiology and epidemiology of the disease within their clinical lectures and practices.<sup>9, 11</sup>

Program levels reported having varying agreement as to whether or not incorporation of educational modalities would increase their confidence levels. The junior program levels were more receptive to educational modalities being incorporated than senior levels. This may be due to their lack of clinical and didactic experience within their program and inconsistent curriculum dedication. Individual interpretations of their current skills, perceived knowledge, and educational preferences may have influenced their responses but not necessarily demonstrate a true relationship of increasing their confidence.

Several previous studies have suggested that when HIV/AIDS related knowledge is incorporated within the curriculum it has demonstrated improvements in the student's attitudes and behaviors towards treating such patients.<sup>11</sup> Other studies have suggested that when the knowledge was gained through previous experience in treating a variety of vulnerable populations to include those living with HIV or AIDS, the provider's attitudes improved and they had greater willingness to treat patients from within these populations.<sup>11</sup> On the other hand, when dental providers harbor negative attitudes towards their patients they may "provide them with suboptimal care" and the stigma that may be perpetuated by the dental provider may act as a barrier to treating patients with HIV or AIDS.<sup>15</sup> With these attitudes and trends concerning their improvement by educational endeavors, the question then arises whether or not current dental educational programs and their associated curriculums are preparing their students with the foundation to treat such patients and have the knowledge base to form such attitudes and behaviors consistent with providing dental care that is consistent with all populations.<sup>14</sup> Research suggests that instruction concerning treatment of at-risk and HIV/AIDS infected patients

is limited to traditional lecture and during clinical setting infection controls and lacks the use of other instructional approaches.<sup>14</sup> It also suggests that increasing knowledge and maintaining appropriate infection control protocols, dental and dental hygiene students were still fearful of treating patients with systemic diseases and were less likely to desire treating such patients than their medical student counterparts.<sup>14</sup> These same attitudes and behaviors were also seen within their educational faculty members and such biases may hinder their ability to incorporate such education and teach their students to be less fearful and willing to treat such populations.<sup>14</sup> Students that studied under such biases “demonstrated these attitudes and behaviors themselves” when studying under “faculty who have limiting attitudes and/or display these behaviors.”<sup>14</sup>

When surveying students’ attitudes towards treating persons living with HIV/AIDS the research conducted by Seacat, Inglehart, and Habil utilized such misconceptions and attitudes so as to assess the current attitudes of dental healthcare students and its future implications.<sup>14</sup> The study’s surveys concluded that the students did not feel that they received enough education and knowledge base and that their school’s curriculum lacked preparation to treat diverse patients and patients with communicable infectious diseases.<sup>14</sup> Though the students within this study increasingly felt more prepared to treat such patients as they progressed within their academic program, the students still failed to be knowledgeable on treating such patients.<sup>14</sup> This study, therefore, demonstrates the need to address current curriculums so as to address any areas of improvement and one such way is to incorporate the student’s perceived knowledge and attitudes towards such patients.<sup>14</sup> By incorporating such student concerns within their program’s curriculum, it allows for the faculty to adjust such educational aspects to

reflect their student's knowledge base. For the level at which the student is aware of treating such patients and the disease's dental implications, allows for the direct translation into their patient care development and when students are not prepared, their inability to fully address the needs of their patients may pose potential risks for both the patient and the provider to include misdiagnoses and subpar dental care.<sup>14</sup> This incorporation also allows for further development of patient-centered care and other professional skill development other than clinical instructions due to the incorporation of awareness, skills, and knowledge outside of clinical instruction.<sup>14</sup> Dental healthcare academic programs that utilizes their students' input and collaboration to address curriculum changes may help further advance their students' professional relationships with their program, their patients, and their community due to increasing the students' self-awareness, their personal values and commitments, and knowledge of ethical responsibilities and duties to their patients of all populations.<sup>14</sup>

## REFERENCES

1. CDC. (21 Sept. 2016). About HIV/AIDS. Retrieved from <http://www.cdc.gov/hiv/basics/whatishiv/>
2. Epstein, J.B. "Oral Malignancies Associated with HIV." *Journal of the Canadian Dental Association*, 2007 Dec; 73(10): 953-6.
3. Tobias, C.R., Fox, J.E., Walter, A.W., Lemay, C.A., and Abel, S.N. "Retention of People Living with HIV/AIDS in Oral Health." *Public Health Reports*, 2012 May; 127(2):45-54.
4. CDC. (20 Oct. 2016). HIV in the United States: At a Glance. Retrieved from <http://www.cdc.gov/hiv/statistics/basics/ataglance/>
5. Moswin, A. H. and Epstein, J. B. "Essential Medical Issues Related to HIV in Dentistry." *Journal of the Canadian Dental Association*, 2007 Dec; 73(10): 945-8.
6. Lemay, C.A., Cashman, S., McDonald, A., and Graves, J. R. "A New Approach to Ensuring Oral Health Care for People Living with HIV/AIDS: The Dental Case Manager." *Preventing Chronic Disease: Public Health Research, Practice, and Policy*, 2012 Oct; 9.
7. Mofidi, M. and Gambrell, A. "Community-based Dental Partnerships: Improving Access to Dental Care for Persons Living with HIV/AIDS." *Journal of Dental Education*, 2009 Nov; 73(11): 1247-59.
8. Naidoo, S. and Vernillo, A. "Ethical and Legal Issues on HIV Testing, Policy, and the Practice of Dentistry." *Journal of Forensic Odontostomatology*, 2012 Dec; 30(2): 7-16.

9. Nassry, D.D., Phelan J.A., Ghookasian, M, Barber, C.A., Norman, R.G., Lloyd, M.M., Schenkel, A., Malamud, D., and Abrams, W.R. "Patient and Provider Acceptance of Oral HIV Screening in a Dental School Setting." *Journal of Dental Education*, 2012 Sept; 76 (9): 1150-5.
10. Pollack, H. A., Metsch, L. R., and Abel, S. "Dental Examinations as an Untapped Opportunity to Provide HIV Testing for High-Risk Individuals." *American Journal of Public Health*, 2010 Jan; 100 (1): 88-89.
11. Seacat, J. D., Mark, D. L., and Daniels, A. S. "Dental Students Treating Patients Living with HIV/AIDs: The Influence of Attitudes and HIV Knowledge." *Journal of Dental Education*, 2009 Apr; 73(4): 437-444.
12. Sears, B., Cooper, C., Younai, F. S., and Donohoe, T. "HIV Discrimination in Dental Care: Results of a Discrimination Testing Study in Los Angeles County." *The Williams Institute*, 2011 Dec.
13. Rajaburn, S., Fox, J.E., McCluskey, A., Guevara, E., Verdecias, N., Jeanty, Y., DeMayo, M, and Mofidi, M. "Patient Perspectives on Improving Oral Health-care Practices among People Living with HIV/AIDS." *Public Health Reports*, 2012 May; 127(2): 73-81.
14. Seacat, J. P., Inglehart, M. R., and Habil, P. "Education about treating Patients with HIV Infections/AIDS: The Student Perspective." *Journal of Dental Education*, 2003, Jun; 67 (6): 630-640.
15. Jin, H., Earnshaw, V. A., Wickersham, J. A., Kamarulzaman, A., Desai, M. M., John, J., and Altice, F. L. "An Assessment of Health-care Students' Attitudes

Towards Patients with or at High Risk for HIV: Implications for education and Cultural Competency.” *AIDS Care*, 2014 Oct; 26 (10): 1223-1228.

16. Wilkins, E. M. (2013). *Clinical Practice of the Dental Hygienist*. Philadelphia, PA: Lippincott Williams and Wilkins.
17. Darby, M. L and Walsh, M. M. (2010). *Dental Hygiene Theory and Practice*. St. Louis, MO: Saunders Elsevier.
18. WHO. (2016). *HIV/AIDS: Treatment and Care*. Retrieved from <http://www.who.int/hiv/topics/treatment/en/>
19. AIDS.gov. (5 Jun. 2015). *HIV Test Types*. Retrieved from <https://www.aids.gov/hiv-aids-basics/prevention/hiv-testing/hiv-test-types/>

## **APPENDICES**

**APPENDIX A: APPROVAL LETTER**

**APPENDIX B: STUDY QUESTIONNAIRE**

**APPENDIX C: RECRUITMENT E-MAIL**

**APPENDIX D: CONSENT FORM**

**APPENDIX A**  
**HRRC APPROVAL LETTER**

*Human Research  
Review Committee  
Human Research  
Protections Office*

August 12, 2016

Christine Nathe  
University of New Mexico

MSC09 5020

Albuquerque, NM 87131

(505) 272-8147

Fax: (505) 272-5584

CNathe@salud.unm.edu

Dear Christine Nathe:

On 8/12/2016, the HRRC reviewed the following submission:

Type of Review: Initial Study  
Title of Study: Importance and Value of HIV Education Amongst Dental  
Hygiene Student Providers  
Investigator: Christine Nathe  
Study ID: 16-257  
Submission ID: 16-257  
IND, IDE, or HDE: None

Submission Summary: Initial Study  
Documents Approved: 

- Study Questions.pdf
- Departmental Exemption.pdf
- UNMHSC-Consent Survey Research.pdf

Review Category: EXEMPTION: Categories (2) Tests, surveys, interviews, or  
observation.

Determinations/Waivers: Documentation of Consent not required.  
HIPAA Authorization Addendum Not Applicable.

Submission Approval Date: 8/12/2016

Approval End Date: None

Effective Date: **8/12/2016**

The HRRC approved the study from 8/12/2016 to inclusive. If modifications were required to secure approval, the effective date will be later than the approval date. The “Effective Date” 8/12/2016 is the date the HRRC approved your modifications and, in all cases, represents the date study activities may begin.

Because it has been granted exemption, this research is not subject to continuing review.

This determination applies only to the activities described in this submission and does not apply should you make any changes to these documents. If changes are being considered and there are questions about whether HRRC review is needed, please submit a study modification to the HRRC for a determination. A change in the research may disqualify this research from the current review category. You can create a modification by clicking Create Modification / CR within the study.

In conducting this study, you are required to follow the Investigator Manual dated April 1, 2015 (HRP-103), which can be found by navigating to the IRB Library.

Sincerely,

A handwritten signature in black ink, reading "Thomas F. Byrd". The signature is written in a cursive style with a large initial 'T' and a prominent flourish at the end.

Thomas F. Byrd, MD

*HRRC Chair*

**APPENDIX B**  
**STUDY QUESTIONNAIRE**



b. If no, would you feel comfortable treating this population? Please make your decision based on the following scale where 1 indicates very uncomfortable and 5 indicates very comfortable.	1 2 3 4 5	
8. I feel that current universal personal protective measures are sufficient to guard me from this disease. Please make your decision based on the following scale where 1 means you strongly disagree and 5 means you strongly agree.	1 2 3 4 5	
9. I would prefer to utilize special precautions such as double-gloving and/or face shields when treating this population. Please make your decision based on the following scale where 1 means you strongly disagree and 5 means you strongly agree.	1 2 3 4 5	
10. Did your dental hygiene program incorporate HIV and its treatment modifications and concerns within the course work?	Yes	No
a. If no, would you feel prepared enough to treat this population? Please make your decision based on the following scale where 1 is very unprepared and 5 is very prepared	1 2 3 4 5	
b. If yes, please indicate how many hours were dedicated.	a. 1 hour or less b. 2 to 4 hours c. 5 or more hours	
11. Do you feel that your dental hygiene program has adequately prepared you to treat this population? Please make your decision based on the following scale where 1 means very inadequately prepared and 5 means very adequately prepared.	1 2 3 4 5	
12. Please indicate to what extent the following scenarios would increase your confidence? Please make your decision based on the following scale where 0 indicates no effect and 5 indicates strongly increase		
a. Meeting a person living with HIV in a classroom setting	0 1 2 3 4 5	
b. More case-study incorporation focusing on this population	0 1 2 3 4 5	
c. Increasing time allotted in didactic courses to cover the material	0 1 2 3 4 5	
13. Would you feel comfortable working in a clinic that specialized in treating this population? Please make your decision based on the following scale where 1 is very uncomfortable and 5 is very comfortable.	1 2 3 4 5	

**APPENDIX C**  
**RECRUITMENT EMAIL**

To Dental Hygiene Program Directors,

My name is Shawndell Bowers. I am a graduate student from the University of New Mexico Department of Dental Medicine. In conjunction with my thesis committee, I am conducting a research study that is aimed to assess the level of confidence and willingness to treat persons living with HIV amongst dental hygiene student providers.

This anonymous survey is designed to be voluntary and will not collect participant personal information. This survey is open currently enrolled junior and senior students that are in an accredited dental hygiene program. The survey will take approximately 10 minutes to complete.

As the program director, I am requesting you to forward this email and its contents to your program listserv so as to foster an anonymous collection process. Enclosed I have included the informed consent forms and a web link to the study. The survey will be open until 5:00pm on September 27, 2016.

Thank you for your time and participation in this project.

Sincerely,

Shawndell Bowers

Sbowers03@salud.unm.edu  
(505)615-5189

Christine Nathe

CNathe@salud.unm.edu  
(505)272-8147

**APPENDIX D**  
**CONSENT FORM**

**University of New Mexico Health Sciences Center  
Informed Consent Cover Letter for Anonymous Surveys**

**STUDY TITLE  
Importance and Value of HIV Education Amongst Dental Hygiene Student  
Providers**

Christine Nathe (Principal Investigator) and Shawndell Bowers, from the Department of Dental Medicine, are conducting a research study in conjunction with thesis committee members. The purpose of the study is to assess the level of confidence and willingness to treat persons living with HIV amongst dental hygiene student providers. You are being asked to participate in this study because you are currently enrolled within an accredited dental hygiene program as either a junior or senior student.

Your participation will involve following directions provided to access an online survey where you will complete based on your personal view points. The survey should take about 10 minutes to complete. Your involvement in the study is voluntary, and you may choose not to participate. There are no names or identifying information associated with this survey. The survey includes questions such as “Do you think this population has barriers to oral care? Have you ever treated a patient that reported being HIV positive? Do you feel that your dental hygiene program has adequately prepared you to treat this population?” You can refuse to answer any of the questions at any time. There are no known risks in this study, but some individuals may experience discomfort when answering questions. All data will be kept for 3 years in a locked file and/or secured online host in Shawndell Bowers office and then destroyed.

