Research

Oral Rapid HIV Testing: Implementation experiences of dental hygiene faculty and students

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Abstract

Purpose: The goal of oral rapid HIV testing (ORHT) in the dental setting is to identify persons who are unaware of their positive HIV status. The purpose of this study was to describe the experiences of dental hygiene faculty and students who implemented ORHT in university-based dental hygiene clinics and to assess the facilitators and barriers to implementation of ORHT in the dental setting.

Methods: Data were collected via semi-structured interviews with dental hygiene faculty and students who conducted ORHT in three dental clinics located in academic institutions. All interview sessions were audio-recorded and transcribed. An inductive approach informed by grounded theory methodology was used to code data and inform theme development. The interview sessions were completed when conceptual saturation was reached.

Results: Five themes were identified by the study participants consisting of dental hygiene faculty (n= 8) and dental hygiene students (n=14). Participants felt dental hygienists are qualified to administer ORHT, which fits within their scope of practice; dental hygienists have the skills to feel comfortable offering ORHT without judgement; training is needed with ORHT administration, reading/discussing test results, and counseling for those who receive reactive results; most patients were receptive to being offered the ORHT; and patients accepted the ORHT because it was free, quick to administer and receive results, and convenient since they were already in the dental setting.

Conclusion: Results from this study indicate that dental hygienists can play a key role in public health efforts to identify persons who are unaware of their HIV status.

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Keywords: HIV testing, oral rapid HIV testing, HIV counseling, people living with HIV, dental hygienists

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Introduction

Healthy People 2020, the United States (U.S.) public heath agenda, includes goals to reduce human immunodeficiency virus (HIV) infections, increase testing, prevent infection risk, increase access to care and improve health outcomes for people living with HIV (PLWH).[1] The Healthy People initiative encourages providers and the public health community to expand HIV testing so PLWH, but unaware of their status, receive a definitive diagnosis and linkage to care.[1] The 2015 National HIV/AIDS Strategy,[2] states that despite remaining a major public health issue, early diagnosis and treatment of HIV allows most infected individuals to live long and healthy lives. The strategy highlights testing and linkage to care as one of four key areas of critical focus to increase the awareness of HIV status, decreasing the likelihood of transmission, and enable access to treatment following an early diagnosis.[2] The U.S. Preventive Services Task Force recommends routine screening for HIV infection in persons 15-65 years old and pregnant women as a means to achieve this goal.[3] In addition, the Centers for Disease Control and Prevention (CDC) recommends annual screening for individuals with specific risk factors.[4]

In alignment with the federal response, the New York State (NYS) Department of Health, developed plans to reduce the number of new HIV infections and improve care and treatment outcomes.[2] The NYS "End AIDS" program seeks to reduce new HIV infections from 3,000 to 750 by

the year 2020 and decrease HIV prevalence by identifying undiagnosed persons with HIV, linking and retaining PLWH in care and treatment, and facilitating access to pre-exposure prophylaxis (PrEP).[5]

Even though dramatic successes during the late 1990s and early 2000s demonstrated reductions in HIV incidence and transmission (including perinatal transmission),[6] much remains to be done to increase screening and testing opportunities. According to the CDC, there are 37,600 HIV infections each year with Black and Hispanic communities being disproportionally affected by HIV,[6] and 22% of new infections were classified as stage 3 (AIDS) during the initial diagnosis in 2015, representing late diagnoses.[7] Linkage to care during that surveillance year was at 75% within one month of diagnosis and 57% of PLWH met criteria for continuous medical care.[7] More importantly, about 15% of the estimated 1,107,700 PLWH that year had an undiagnosed HIV infection, with the highest percentage of undiagnosed infections in younger individuals between the ages of 13-24 years of age.[7]

The NYS Health Department reported 145,900 PLWH in 2014, representing a rate of 872.1 per 100,000, the second highest estimated prevalence in the U.S. after the District of Columbia.[8] There were 3,128 new HIV diagnoses in NYS in 2015, a rate higher than the national average (15.8 vs. 12.3 per 100,000).[7] Despite the NYS Public Health Law (2010) requiring health care providers to routinely offer HIV testing to all individuals aged 13 to 64 years,[9] about 12% of HIV infections in 2014 were undiagnosed, although this rate was lower than nationwide.[8] Suboptimal compliance with the law leads to reduced identification of undiagnosed people with HIV, therefore, implementation of testing is essential.[9] Among the measures designed to increase early HIV diagnosis by making "routine HIV testing truly routine," the importance of offering HIV testing in additional health care facilities, including dental offices, has been stressed.[9]

New York City (NYC) has successfully implemented several high impact prevention strategies to help end the HIV epidemic.[10] For the first time since the early 1980's, the number of new HIV diagnoses in NYC has fallen below 2,500.[10] While the all-cause mortality and HIV-related deaths continues to decline, the number of PLWH achieving viral suppression has increased. Additionally, there were no perinatal HIV transmissions reported in 2015.[10] However, disparities by gender, race/ethnicity, transmission risk, geography and area-based poverty level persist both among newly diagnosed people with HIV/AIDS (2,493) and among people living with HIV/AIDS in 2015 (121,616).[10]

Much more remains to be done to end the HIV epidemic; including improved screening of persons at risk. Towards that goal, the nation's largest HIV testing initiative, *New York Knows* launched in 2014 with the goal of having all NYC residents learn their HIV status and connect them to care if needed.[11] Integrating latest 4th generation HIV tests, capable of detecting HIV infection in its earliest and most infectious stage, is encouraged in non-traditional settings, promoting early diagnosis and linkage to care.[9] In order to conduct rapid HIV testing in non-traditional settings such as the dental office, providers must obtain a Clinical Laboratory Improvement Amendment (CLIA) waiver from the NYS Health Department.[12] Several CLIA-waived rapid HIV tests of whole blood or oral fluid are simple, low-risk, require minimal training, and are available in settings such as community-based organizations, field test sites, mobile clinics, or university clinics.[13] Availability of salivary tests such as OraQuick ADVANCE Rapid HIV-1/2 Antibody Test (OraSure Technologies, Inc.; Bethlehem, PA)[14] facilitates screening in the dental setting.

A recent study comparing the effectiveness of oral rapid HIV testing (ORHT) and routine serum-based testing in an outpatient dental clinic in China demonstrated patients' preference of ORHT (96% preferred ORHT vs. 28% for routine serum-based testing).[15] In addition to better acceptance rate, the study also found superior test completion and receiving/discussion of results rates in the ORHT group, suggesting feasibility of this testing method in a dental setting.[15]

A number of reports have examined patients'[16,17] and providers'[18–23] attitudes and acceptance of screenings for medical conditions, including HIV, in dental settings. Dentists[18,23] and dental hygienists[19,23] exhibited favorable attitudes toward conducting screenings for medical conditions and were willing to conduct chairside testing, showing preference for non-invasive methods with immediate results.[18,19,23] While generally high, willingness to conduct HIV testing among dental providers was lower than screening for other medical conditions (cardiovascular diseases, diabetes mellitus).[18,19] Interestingly, fewer dentists (69%, n=1,903)[18] considered HIV testing in dental offices 'very' or 'somewhat' important than dental hygienists (78%, n=3,102).[19] Results of a 2015 nationwide study evaluating physicians' attitudes toward incorporating chair-side screenings for HIV in dental practices were similar to the views of dental providers.[24] The majority of study participants supported screenings for medical conditions by dentists along with appropriate referrals for any necessary follow-up, and over half (58%) felt HIV screenings were worthwhile to identify infected patients. However,

ORHT was viewed less favorably than other screening tests and respondents felt that HIV point-of-care testing in dental settings was the least effective when compared to all other medical conditions. Patients' willingness to accept HIV screenings, a concern shared by dental providers,[18,19] and the level of training required by dentists to perform the screenings were the most important considerations for physicians.[24]

While universal screening of all dental patients seems unlikely, an approach targeting high-risk persons may be more appropriate,[25] and dental providers may be uniquely positioned to offer ORHT.[26] A survey identified that over 70% of adults with self-reported HIV risk, who either were never tested or have not been tested in the last five years, had seen a dentist in the prior two years, demonstrating the potential role of dental care providers in identifying HIV infections.[26] Attitudes toward HIV screening, specifically ORHT, among dentists,[21,27] dental hygienists,[22] and dental faculty[28] have been examined in the literature ranging from qualitative studies to larger nationally representative surveys of dentists. [21,22,27,28] There is agreement regarding the role of dentists in identifying undiagnosed HIV infections. A recent qualitative study evaluating the experiences and perspectives of U.S. dental providers offering ORHT in their offices found that both dentists and dental hygienists strongly supported ORHT in the dental setting.[29] In a representative sample of dentists,[21] most respondents (60%, n=1,802), indicated at least some willingness to offer HIV screenings to their patients while 40% felt HIV testing should be part of the dental role.[21] However, only 14 of the dentists surveyed offered ORHT testing and less than 12% were familiar with the CDC guidelines,[4] dating back to 2006, recommending routine HIV testing of adults in health care settings.[21] In another study only one out of 40 interviewed dentists were aware that ORHT has been available since 2004.[27] These findings indicate the need to incorporate HIV education and prevention programs in dental school curricula.[21,27] This is especially important due to the significant association of previous clinical knowledge and HIV training with acceptance of HIV testing as part of dental professional role.[21] In a pilot study of patient and provider acceptance of HIV testing at a dental school, the majority of faculty accepted incorporating HIV testing into routine patient care.[28]

Dental hygienists, as members of a dental team whose primary role includes disease prevention and patient education, may be ideally positioned to offer and conduct ORHT.[30] A national survey of dental hygienists was conducted to evaluate knowledge and attitudes towards PLWH and an assessment of willingness to provide HIV testing.[22] While increased knowledge about HIV was associated with increased comfort in working with medically compromised patients and HIV prevention methods counseling, the majority of respondents indicated that they would be willing to receive training/certification in HIV testing and would be willing to conduct HIV tests, independent of their level of knowledge of the disease.[22]

Feasibility of offering HIV testing in the dental setting has been shown to be dependent on the patients' acceptance of the testing and willingness to be tested by a dental professional.[18,19,24] Several studies examining patients' attitudes towards testing in dental settings,[17,31] including the dental school/clinic setting[28] and most recently, three dental hygiene clinics located in academic institutions in NYC,[32] demonstrated that most patients viewed the opportunity to have HIV testing in dental settings positively and were willing to be tested in dental settings. Importantly, the majority of patients surveyed were willing to accept screenings from dental hygienists,[32] supporting the potential role of dental hygienists in administering ORHT.

Dental providers with experience in administering ORHT showed positive support towards implementing HIV screening in dental settings. However, experiences and attitudes of dental hygiene faculty and students with administering OHRT in dental clinics located in academic institutions have not been studied. The purpose of this study was to evaluate the experiences of dental hygiene faculty and students administering ORHT in dental clinics located in academic institutions and to assess their views of the facilitators and barriers to implementing ORHT in the dental setting.

Methods

Three dental hygiene clinics located in academic institutions, Hostos Community College in the Bronx, NYC College of Technology in Brooklyn, and Farmingdale State College on Long Island, were chosen as study sites. Each site had a study coordinator, laboratory director, and dental hygiene faculty and students implementing ORHT. The methods of the original implementation study have been previously described in the literature.[32] The focus of this study was to evaluate the experiences of the dental hygiene faculty and students who implemented ORHT in dental clinics located in academic institutions through one-on-one interviews and Institutional Review Board (IRB) approval was granted.

All senior dental hygiene students enrolled in the three participating dental hygiene programs were invited to be trained in HIV testing through didactic classroom training, online modules, and practice sessions. The training included an overview of HIV epidemiology, ORHT technology, best practices in conducting rapid HIV testing, how to deliver

HIV testing results in a compassionate and professional manner, a review of the study protocol and paperwork, and practice sessions. Fourteen students accepted the offer and were approved to participate by their dental hygiene faculty.

Once the study site completed the OHRT training, participants were interviewed in order to gauge their level of comfort in administering ORHT and their perceptions on barriers and facilitators to incorporating the testing in dental hygiene clinics located in academic institutions. Data were collected using semi-structured interviews with faculty and student participants (n=22). Interview topics were discussed using a semi-structured discussion guide developed by the research team with expert consultation. Interview topics, shown in Table I, were selected after a careful review of the literature and discussion with HIV testing experts. Semi-structured one-on-one interviews, conducted by the same researcher, took place at the three dental clinic sites. Written consent was obtained prior to recording the interview session. Further exploration of new insights allowed for a better understanding of the extrapolated topics and additional probes were included as well as adapting interview questions as needed. Audio-recordings were transcribed and analyzed for thematic saturation of any barriers or facilitators to administering ORHT in the dental setting.

Using a grounded theory approach, analysis began following the first interview so the schedule could be altered as needed in subsequent interviews.[33] A framework analysis using a theme-based approach was used.[34] This process continued in order to examine new themes as they emerged as well as to ensure all concepts and ideas were explored. The first two coders performed line by line coding of all transcripts and a third coder reviewed 30% of transcripts. The coding team met to determine that the coding was approached in a consistent manner. Following code development, a constant comparative approach was used to cross-examine codes within and across transcripts to discover and extrapolate themes.[35] Specific quotes were highlighted and connected to the themes they supported. After themes were generated and analysis was complete, findings were shared with all involved to ensure validity.

Results

Support for ORHT and Desire for Training

Themes from dental hygiene faculty (n=8) and senior dental hygiene students (n=14) are presented in Table I. Most participants (subsequently noted as interviewees) interviewed strongly supported the idea of ORHT in the dental setting and believed so because the test was quick to administer, noninvasive, and could be easily performed by practicing clinicians or dental hygiene students. In addition, interviewees felt that dental hygienists have optimal relationships with their patients, therefore patients may be more comfortable and thus more inclined to agree to HIV testing in a dental office. It is important to note the ORHT was provided for free in this study. While most dental hygienists have not discussed HIV testing with their colleagues, many felt there would be mixed reactions regarding providing the testing with some agreeing with the idea, and others not. Some interviewees felt that within an academic environment, HIV testing might be recognized as a needed service; however, there may be some degree of discomfort in administering the test as well as time constraint issues. While most interviewees noted they had the necessary skills and were capable of performing ORHT, the majority agreed that additional training regarding the proper administration of the test and empathetic strategies for approaching a patient with a reactive HIV test were essential. Many were also uncomfortable with the concept of telling the patient that their test result was reactive.

Assessing HIV Status and Offering ORHT

Many dental hygienists did not verbally ask the patients to self-report their HIV status, however, interviewees noted that it is common practice not to ask because this information is available on the medical intake forms. When asked about oral symptoms associated with HIV, all interviewees acknowledged that while they do not look for HIV-specific symptoms, all patients received a comprehensive oral exam to assess for any abnormal clinical pathology. All suspicious lesions were documented and reported with scheduled follow up visits. Throughout the study period, most interviewees offered the ORHT to all of their patients. In some instances, the ORHT was only offered to some individuals due to time constraint issues. With the added education received, the majority of the participants were very comfortable offering the ORHT to their patients. While some noted initial hesitation due to the sensitivity and sometimes stigmatization of HIV, they felt they gained confidence and improved their administration techniques over time.

Patient Reactions to ORHT

In general, no interviewee encountered any difficulties with offering the ORHT to patients and noted that most patients were very receptive and enthusiastic to get tested since it was incorporated into the dental appointment, and was fast, easy, and free. Some patients were surprised that HIV testing was offered in a dental setting, but no one appeared to be offended. Many patients agreed to receive the test because they wanted to know their HIV status. It was hypothesized that patients refusing the test did so because they already

knew their status, had been previously tested, or did not feel they were at risk for contracting HIV.

Systemic Screenings Including ORHT in the Dental Setting

Most interviewees mentioned that they perform oral cancer screening, caries screening and blood pressure monitoring, which are considered standard of care within a dental clinic. They also screened for tobacco use, offering smoking cessation information and education on how tobacco use affects periodontal health. Overconsumption of alcohol was included in some medical intake forms, but the interviewees did not note related cessation or harm reduction policies and practices.

General recommendations of the interviewees to dental hygienists included that they be trained to administer ORHT and to comfortably discuss results with patients if they have a reactive test result. In addition, the ORHT should be offered to all patients at the beginning of the dental appointment, the ORHT can then be administered to consenting patients so they can receive their results by the end of the appointment.

Discussion

This study evaluated the experiences and viewpoints of dental hygiene faculty and students regarding the facilitators and barriers to implementing ORHT in dental settings. Dental hygienists and dental hygiene students strongly support the concept of administering ORHT; such feelings have been attributed to the efficiency, simplicity, reliability, non-invasiveness, and rapidity of the test.[29] Findings from this study are comparable to previous studies evaluating the viewpoints of dental and medical professionals regarding screening for medical conditions in the dental setting;[28,] with the majority of health care providers indicating that systemic conditions should be assessed in the dental setting.[18, 19, 23, 24] These attitudes can be used to support efforts aimed at incorporating ORHT in the dental setting, creating plans to allow dental hygienists to play a key role in educating patients and advancing total health.[30]

The majority of participants were confident and comfortable offering HIV testing to patients possibly due to strong communication skills acquired during professional training. In turn, most patients seemed receptive and enthusiastic in accepting ORHT. These results are consistent with the findings of Nassry et al. demonstrating that patients may be likely to agree to ORHT when their dental provider is the individual offering the test.[28] Patient willingness for ORHT may also be due to ease of testing, no associated cost, and the fact that it was a component of the overall dental hygiene appointment; suggesting that by increasing ORHT in dental settings, may also increase the numbers of individuals tested for HIV.

Time constraints and the prospect of delivering reactive results were distinguished as the main impediments to implementing ORHT in the dental setting. Patient appointment is often limited, making it difficult to incorporate additional services. When the appointment time was limited, study participants did not offer ORHT. Participants were also concerned delivering reactive results. These findings align with those of Siegel et al. indicating a primary concern of dentists regarding implementing ORHT was their ability to adequately communicate positive results to patients, in addition to feeling that they were too busy to incorporate ORHT into daily practice.[27] These barriers will need to be addressed as efforts are made to implement ORHT in dental settings.

Recommendations to assist with preparing dental hygienists to conduct ORHT were explored through the interview process. Participants expressed the urgency in providing training on administering ORHT and strategies for approaching patients with reactive results. Familiarity with the procedure is required to conduct the test and properly read results; knowledge and communication skills are needed to empathetically discuss any reactive findings. Similarly, previous research identified "communicating with patients about test outcomes" as an important factor that needs to be addressed to strengthen implementation.[27] Incorporating ORHT into dental hygiene curriculum and providing practitioners with professional development opportunities to develop the appropriate knowledge base and skill set can assist in achieving these outcomes.

Findings from this study demonstrate that dental hygienists are well positioned to perform ORHT. This finding is supported by Pollack et al. who showed that a large percentage of adults at risk for HIV have little to no communication with other medical providers but are in regular contact with the dental provider.[26] Participants in this study indicated they have a unique role in identifying HIV infection and that ORHT falls within their scope of practice, findings that were also highlighted by Santella et al., who explored the nature of salivary HIV testing within the realm of dentistry.[25] Dental hygienists often see their patients multiple times throughout the year, developing trusting relationships with their patients, who in turn often experience a high level of comfort with them. As a result, these patients may be more inclined to accept ORHT in dental settings, evidence that can be used to support the HIV testing objectives and recommendations of Healthy People 2020,[1] the 2015 National HIV/AIDS strategy,[2] the U.S. Preventive Services Task Force,[3] and the CDC.[4] Additionally, these findings can be used to implement action strategies enabling dental providers to take advantage of

Table I. Themes from Semi-Structured Interviews
(n=22; dental hygiene faculty: n=8; dental hygiene students: n=14)

Topic	Theme	Illustrative Quote(s)
Opinions on dental hygienists as a professional group conducting oral rapid HIV testing (ORHT)	Dental hygienists are qualified to administer ORHT testing and it is within their scope of pratice.	"I personally believe that it's a good idea because we are healthcare providers. We do see our patients usually every 6 months, if not more often, so we do see our patient frequently, we develop a relationship with our patients where they trust us." (*Faculty*) "I think it fits into their scope of practice. I think it fits into what we expect them to do as part of a healthcare team, and I think that they are a logical choice to work with dentists and the physician to do HIV testing." (*Faculty*)
Feelings of dental hygiene colleagues regarding providing ORHT to their patients	There was a mixed level of support when study participants discussed ORHT in the dental setting with their colleagues. The most significant issue noted was discussing reactive ORHT results with patients.	"Like I said, you know, something that they agree would be great for us to move into doing, or offer in a, in a dental setting." (*Faculty*) "I think, at first when you ask a lot of us, oh, it's great. It's fine. But again, I think the dilemma is when you have a positive result. How do you deal with that after?" (*Student*)
Additional training needed by dental hygienists in order to conduct ORHT	Training is needed with test administration, reading/ discussing test results, and counseling those who receive reactive test results.	"I would say when, if a patient, when it's positive, I feel like we need to do more of a training for counseling, and how you would approach the situation and talk to the patient about their results." (*Student*) "Yeah, definitely. Delivering results. Speaking to patients about the test. What the results of the test mean. That's about it." (*Faculty*) "Yes". "They already have the skills. I think they need confidence. The skill set is part of what we do all the time. We work in the mouth…..this is not a stretch. It's the confidence of being able to do the testing and to be able to do it correctly, what to do if there's a positive: how do you handle the situation and how do you talk to patient?" (*Faculty*)
Clinical examination of oral symptoms associated with HIV infection	A thorough intra- and extraoral examination is performed on all patients. While not specific for HIV, it is standard professional practice to assess for anything abnormal.	" Well, not specifically, but definitely we'll look for all signs of oral lesions and all signs of, different signs of inflammation." (*Faculty*) "Yeah, I guess the answer would be yes, because we really look for anything that falls under outside of the umbrella of normal, or within normal limits. So any type of lesion, discoloration, would be something that we would absolutely, absolutely report on." (*Faculty*)
Frequency of offering ORHT to dental patients	Although the majority of study participants (dental hygiene faculty and students) offered all patients the opportunity to be tested, some patients agreed to testing while others refused.	"To everyone. Sorry, to every patient. To every patient, it was definitely asked. A lot of them were very interested, half the time, it's just a matter of time, availability." (*Student*) "Yeah, for some people. I can't remember. Yeah, I think most of my patients that I really know; I was able to ask them, but not everybody because – yeah, I think also the time constraint." (*Student*) "Some of them. Well, most of the patients I see are family members, so it was just kind of awkward to ask my grandmother. So, it's just different scenarios for different patients, but I did notice that I would ask the younger patients. I had a couple who weren't family members, so in that instance, I would always ask them." (*Student*)

Topic	Theme	Illustrative Quote(s)
Level of comfort offering ORHT to dental patients	Most dental hygienists were very comfortable offering ORHT to patients since they have acquired the necessary skills to interact well with patients.	"Very comfortable conducting this through this study. The first couple (of times), I was apprehensive, nervous, but I feel very comfortable now, like anything else." (*Faculty*) "In my case, I am. Because, I mean, we were taught how to do it and everything, so I am comfortable offering it." (*Student*)
Patients reaction to being offered ORHT in dental setting	Most patients were receptive to the idea of being tested since it was convenient, fast, and free, but yet some were surprised that the request was coming from a dental hygienist. While some patients politely refused testing, no one was offended.	"Some said, okay, I'll keep that in mind, you know, some of them had a, a look on their face as to, sometimes why she did ask me. Some reacted by saying, okay, I'll come back, but then they would never return, you know." (*Faculty*) "No, I mean nobody was really offended. Like I said, they were really all for it or they had to be just like no thank you. I've already been tested." (*Student*)
Problems as a result of offering ORHT to dental patients	None of the dental hygienists had any problems offering HIV test to patients since most people were receptive while some politely refused.	"No difficulties, Nobody gave us a hard time." (*Student*) "No, we didn't seem to have any issues with it." (*Student*)
Other chairside screenings offered in the dental setting	Oral cancer screenings and blood pressure were standard screenings practiced in the university-based dental hygiene clinics. While patients were asked about alcohol and tobacco use, there were limited resources for cessation services.	"We do an oral cancer screening and a clinical oral pathology exam. Here, we also do blood pressure routinely and blood glucose levels if needed." (*Faculty*) "We do ask about alcohol use and we ask frequency, and that's it. It kind of stay there." (*Faculty*) "We do discuss tobacco use and we do offer tobacco cessation programs…" (*Student*)
Recommendations for implementing ORHT in the dental setting	The major recommendation was to make sure that anyone who conducts HIV testing has an adequate training to correctly perform the HIV test and interpret/discuss results.	" I think they need to be very well versed in the actual, what HIV is, and be able to answer questions. And again, back to the counseling component, in terms of if someone is positive that they would need to be able to answer questions and make the patient feel comfortable." (*Faculty*) "I would recommend all that we received in our preparation through the department of health; I think those prep training programs were outstanding. It was wonderful that they were able to put it into a one-day or half-day, and I do think if hygienists are, if they can gear it and put it in that one package like they did for us, I think that would be very advantageous and beneficial. I do feel that everyone should attend and complete that." (*Faculty*)

the opportunity to administer ORHT. Executing such plans can result in early diagnosis, improved treatment modalities and decreased disease transmission, thus reducing morbidity and mortality.

While the academic dental hygiene clinic settings can provide valuable data regarding the administration of ORHT, there are limitations due to the treatment time-frame, experience level of the operator and the unique socioeconomic category of the patient. Dental hygiene academic clinical settings require patients to be available for periods of up to four hours, placing the patient in a different frame of mind regarding time usage versus the private practice setting. Student experience levels are limited, as compared to those of a practicing professional. As clinical skills and the art of patient communication develop, the practicing clinician may form more sophisticated opinions regarding the utility of ORHT. Also, because the academic setting appeals to a patient population seeking a quality service for a reduced fee, it attracts only a portion of the at-risk population, which may influence results of studies limited to these settings.

Recommendations for further studies in this area involve the use of experienced clinicians working in a variety of dental care settings including private practice, public health clinics, and military health care facilities. Studies that include payment options and insurance plans may also prove to be useful tools in correlating relationships between affordability and patient acceptance of ORHT. Studies could be also be designed to assess the opinions of dental providers in different types of practices.

Education and training are important factors in the incorporation of ORHT as a routine aspect of patient care. With greater levels of knowledge and experience, dental hygiene graduates will likely be more comfortable administering ORHT and communicating test results. Research in the areas of course design and academic scheduling are recommended. Consideration could be given to introducing HIV epidemiology into the content of didactic courses addressing disease prevention. Additionally, clinical courses could provide an opportunity to practice time management, patient acceptance of ORHT and discussion of the results of routine HIV screening.

Limitations include the location of the study and the academic clinic sites. Study participants were located within one geographic area (metro NYC and Long Island) and may not represent the views of all providers. The ORHT was implemented within dental hygiene clinics located within academic institutions. Although similar to traditional dental settings, academic settings likely serve patients who do not routinely access private dental practices, so their experiences may be different.

Conclusions

Results from this study support the need for more widespread and large-scale implementation studies to document the feasibility of incorporating ORHT as a routine part of dental care. The dental setting may be a convenient and accessible venue to expand efforts in the education, detection, and linkage to care services for individuals at risk or infected with HIV. Long-standing patient-clinician relationships built on trust and respect, may make the dental environment conducive and comfortable for administering ORHT. As educators and clinicians, dental hygienists are often on the front lines of disease detection and health promotion. Findings from this study support the need for increased education on ORHT and indicate the willingness of dental hygiene educators and students to conduct testing as part of dental hygiene process of care. Now is the time to include ORHT in the chairside health screenings offered in the dental setting.

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