

Literature review of the undertaking of the Oral Rapid Test for the detection of HIV by the dental surgeon

Revisão da literatura sobre a realização do Teste Rápido Oral de detecção do HIV pelo cirurgião dentista

Revisión de la literatura sobre el desempeño de la prueba oral rápida para la detección del VIH por parte del dentista

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Abstract

This article sought to identify articles published on the action of the dentist in the application of the Oral Rapid HIV Test (ORHT). The search was undertaken from October 2018 to August 2019, and investigated the databases PubMed, Cochrane, Lilacs e Scopus, from articles published in the English language during the period from 2015 to 2019. Altogether 89 bibliographical references were found, after repetitions and articles that did not deal with the subject were eliminated, a total of 11 remained for analysis. Five articles reported the direct clinical action of the dentist and the remainder dealt with research on the oral rapid test. The studies showed how the dentist may contribute meaningfully to public health by the identification of persons infected with HIV.

Key words: Dentists, HIV, Early diagnosis, Public health policy, Diagnostic reagent kits.

Resumo

O presente estudo visou identificar artigos publicados sobre a atuação do dentista na realização do Teste Rápido Oral (TRO) de detecção do HIV. A busca foi feita de outubro de 2018 a agosto de 2019, verificando-se as bases de dados PubMed, Cochrane, Lilacs e Scopus, de artigos publicados no idioma inglês, relativos no período 2015 a 2019. No total foram encontradas 89 referências bibliográficas, retirando-se as duplicidades, artigos que não tratavam do tema o que resultou em um total de 11, para análise. Cinco artigos relacionaram a atuação clínica direta do dentista e os demais foram sobre pesquisas do teste oral rápido. Os estudos mostram como o dentista pode contribuir de forma significativa para a saúde pública na identificação de pessoas infectadas pelo HIV.

Palavras-chave: Odontólogos, HIV, Diagnóstico Precoce, Políticas Públicas de Saúde, Kit de Reagentes para Diagnóstico.

Resumen

El presente estudio tuvo como objetivo identificar artículos publicados sobre el desempeño del dentista en la realización de la Prueba Oral Rápida (TRO) para la detección del VIH. La búsqueda se realizó entre octubre de 2018 y agosto de 2019, verificando las bases de datos PubMed, Cochrane, Lilacs y Scopus de artículos publicados en inglés, de 2015 a 2019. En total, se encontraron 89 referencias bibliográficas, eliminando duplicaciones, artículos que no abordaron el tema, resultando en un total de 11 para análisis. Cinco artículos relataron el desempeño clínico directo del dentista y los otros trataron sobre la investigación de la prueba oral rápida. Los estudios muestran cómo el dentista puede hacer una contribución significativa a la salud pública en la identificación de personas infectadas con el VIH.

Palabras clave: Odontólogos, VIH, Diagnóstico precoz, Políticas públicas de salud, Juego de reactivos para diagnóstico.

Introduction

The magnitude of HIV and AIDS infection in the world has shown that in the last 40 years the consequences are harmful and continue to constitute a concern for public health¹.

Seven thousand people are infected by HIV every day in the world. Sub-Saharan Africa accounts for 60% of the individuals who live with HIV, 58% of whom are women. The Caribbean, eastern Europe and central Asia have a prevalence ratio of 1% of the population and have areas profoundly affected by the epidemic¹.

According to the Joint Program of the United Nations on HIV/AIDS² the number of people living with HIV/AIDS in Latin America attained 1.9 million in 2018. There was an increase of 7% in the number of new cases between 2010 and 2018, showing that Latin America was one of the worst regions in the fight against HIV with an estimate of 100,000 persons who had acquired HIV³. The country with the greatest increase was Chile (34% in the period), followed by Bolivia (22%), Brazil and Costa Rica (both with 21%)³. In Brazil, from 2007 to June 2018, Sinan had notified 247,795 cases of infection by HIV⁴.

It is a challenge to identify early, the persons who are infected but who have still not presented clinical evidence of AIDS. By 2030, it is expected that the number of deaths related to the disease will have diminished by 80%, but with an increase in the cases of the infection diagnosed and undergoing timely treatment⁵.

As an option for the early diagnosis and preventive treatment of the HIV virus, the Oral Fluid Test or the Oral Rapid HIV Test (ORHT) was developed in 2004⁶. Initially, it sought to reach all the persons who faced difficulties of access to laboratories and exams and who had faced situations of prejudice and who wished to preserve their intimacy and identity, as this was an alternative to the conventional test made by the collection of blood in the laboratory and to the rapid test with the use of needles in the fingers, rapidly and economically. With the passage of time, it has been offered more generally by health services and even in commercial establishments.

In 2005, Regulation nº 34/05 was implanted in Brazil with a view to regulating the use of rapid anti-HIV tests in specific situations⁷. This legislation sought to amplify access to the diagnosis of HIV infection, giving as a justification the fact that knowledge of the serological status and early diagnosis contributed to the interruption of the chain of transmission. The beginning of the expanded implantation throughout the national

territory, by means of the ORHT became possible as from the implantation of regulation nº 29 of December 17, 2013⁸. The test consists of the withdrawal of the oral fluid by means of a collector from the region of the upper and lower buccal gingival sulcus, 4 times, with slight friction⁹. The exam guarantees a precision of 99% of positive results with an approximate immunological window of up to three months (the time between the possible infection and the exam's giving a positive result) and which ought, if necessary, to be repeated after another three months of an exposure of risk to the contagion of HIV¹⁰.

Table 1 – Rapid oral tests approved by Anvisa, in Brazil

Registration number	Technical name	Risk class	Commercial name	Producer's name	Country of production	Date of registration
80686840003	Selftest for antibodies of the Human Immunodeficiency Virus (HIV)	IV	Oraquick hiv self-test	Pacific biotech co, ltd	Thailand	10/12/2018
80686840003	Selftest for antibodies of the Human Immunodeficiency Virus (HIV)	IV	Oraquick hiv self-test	Orasure technologies, inc.	USA	10/12/2018
81176360001	Selftest for antibodies of the Human immunodeficiency Virus (HIV)	IV	Biosure hiv self test	Biosure uk co. Ltd	United Kingdom	15/10/2018
80954880049	Selftest for antibodies of the Human Immunodeficiency Virus (HIV)	IV	Autoteste hiv detect oral	Eco diagnostica ltda	Brazil	18/12/2017

Source: Anvisa¹¹

In Brazil, as from 2017, the ORHT were regulated by Anvisa and are used in the Unified Health System (SUS). It is possible to do the test for HIV at a Center for Testing and Advice (CTA), in Basic Health Units (UBS), in specialized services of attention to sexually transmissible diseases and hospitals. The rapid tests may be undertaken by means of a venous puncture or samples of oral fluid to verify the presence of the antibodies produced by the HIV infection. The self-tests have been commercialized by private drugstores and by the SUS network as from January 2019 and can be carried out by the persons themselves, with the collection of blood, by means of a specific lancet to prick the finger which comes in the kit or the oral fluid test which is non-invasive and painless, is of easy use and is able to confirm the result enabling the contaminated person to start the treatment available on the public health network. Both present a result in about 20 minutes and in negative cases should be

repeated after 30 days. In positive cases, the result should be confirmed at a health service¹².

The Department of Surveillance, Prevention and Control of Sexually Transmissible Diseases, of HIV/Aids and of the Viral Hepatitis, offers training at a distance on ORHT, by means of videos provided by the Ministry of Health¹⁰. The dental surgeon is one of the professionals who can undergo the training and carry out the ORHT, as they are an important agent of prevention.

In the USA, dental assistants are trained to apply the ORHT and to identify the persons who do not know their serological situation, because they possess knowledge of HIV and abilities which fit into the practice of the reception of persons who seek the test¹³⁻¹⁴.

A representative research project with dental-surgeons undertaken in the USA in 2010 and 2011 showed that the majority of them considered that the dentist's office is a convenient place for undertaking the test, their offer constituting a strategy to confront the HIV epidemic, but they identified as barriers to the implementation of this action in dental surgeries, the cost, the stigma associated with the disease, the lack of experience of the professional in the activity and their not having the specific abilities to deal with positive ORHT, though they agreed that it was of great value to the population¹⁵.

Dentists, in Australia, know that 14% of the persons who live with HIV, as also those in other countries, do not know of their serological condition and that the dental surgeons can help to reduce this percentage, by means chiefly of the application of the ORHT, for the population who do not have access to the means for monitoring the infection¹⁶.

In a first search of the literature on the activity of dental surgeons and the ORHT, no national studies were found. In view of this, the objective of the present study is to identify what the situation of dental surgeons with regard to ORHT is, as described in the scientific literature.

Methods

One is here dealing with an integrative review study on the question: "what is there in the literature on the activity of dental surgeons in the application of ORHT for HIV?". An on-line search was carried out for scientific articles, in the English language, published during the period from 2015 to 2019.

The following bases was accessed during the period from October 2018 to August 2019: a) PubMed/MEDLINE: a source of multidisciplinary information on biomedical literature with the indexation of articles of journals at the world level¹⁷; b) LILACS (Literatura Latino-Americana e do Caribe em Ciências da Saúde: Literature of Latin America and the Caribbean on Health Sciences): is the data-base of technical-scientific literature of the health field, which also functions as a store of the scientific production of the whole of Latin America and the Caribbean¹⁸; c) Scopus: is a data-base of the data of peer reviews and possesses tools which accompany, analyze and visualize bibliographical research, containing abstracts and interoperability with various other bases with complete texts¹⁹ and; d) *Cochrane Library*: a collection of the databanks which contain various types of independent evidence, of high quality, to report on the taking of decisions in the health field²⁰.

The search was undertaken in two stages. Stage 1, in which Health Terminology was used, after consulting the Descriptors in Health Sciences (DeCS), and the following descriptors were used: *Routine Diagnostic Tests*, *Diagnostic Reagent Kits* and HIV. As no articles in accordance with these descriptors were found there followed a second stage using the key words “oral rapid test” and “HIV”. In stage 2, the search was detailed, automatically, by the source of information PubMed as is presented in Table 2, where the bases for the indexation and the strategies used may be found.

Table 2 – Identification of the basis for the indexation of the articles and the search strategy, by descriptors and dates.

Base	Search strategy by descriptors and dates
PubMed/medline	-1 st stage of search: ("Diagnostic Tests, Routine"[Mesh] OR "Reagent Kits, Diagnostic"[Mesh]) AND "HIV"[Mesh] AND ("2017/01/01"[PDAT] : "2018/12/31"[PDAT]). -2 nd stage was “oral rapid test” [All Fields] and “hiv” [All Fields].
LILACS	("Diagnostic Tests, Routine" OR "Reagent Kits, Diagnostic") AND "HIV"
Scopus	“oral rapid test” AND “hiv”
Cochrane	“oral rapid HIV testing” AND 2015 to 2019.

They have been represented by means of a fluxogram (Figure 1), the number of articles found having been selected by the identification of the number of articles found, in the end 11 articles were selected, identified by the capital letters from A to K.

Fluxogram of the number of articles

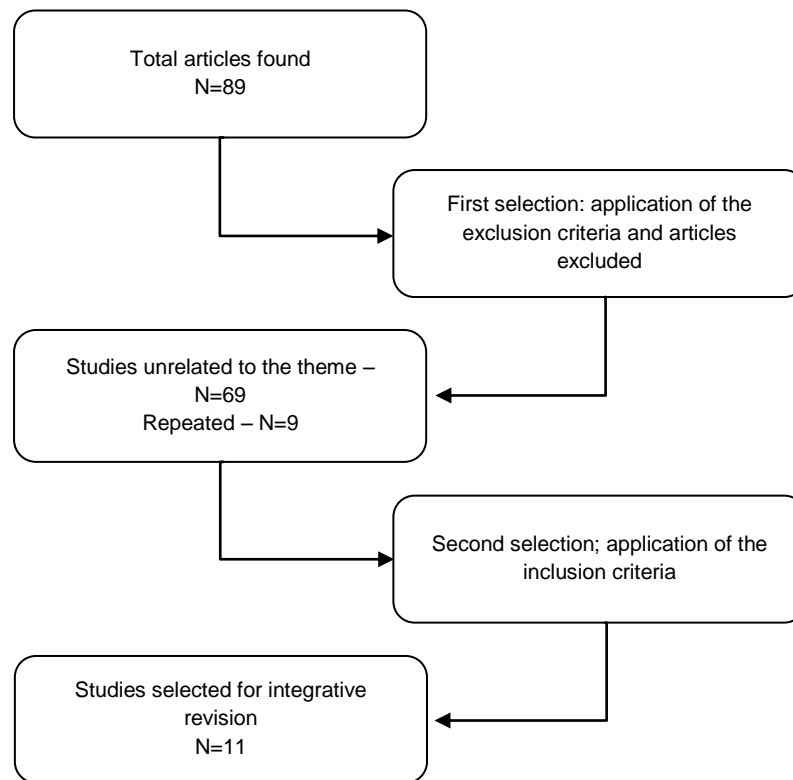


Figure 1 – Flow diagram of the search made in the literature and the inclusion of articles.

A spread-sheet was prepared on Excel with the publications identified. As an exclusion criterion, first the repetitions were eliminated, then after the reading of the titles and abstracts those of the greatest interest were selected. Then the articles not related to the main theme and those which were outside the period selected were withdrawn. As inclusion criteria articles related to the principal theme which included dentists and dental clinics which applied the ORHT, were selected complete and in English. The spread sheet contained the following information: title of the article, database, country of the study, objective, study design, clinical activity of the dentist in the application of the ORHT, results and conclusion/final considerations. On the basis of the study design the methodology employed in each article was ascertained.

Result and discussion

On the bases researched 89 articles were found distributed as follows: PubMed = 78, Scopus = 6, Lilacs = 1, Cochrane = 4.

After the application of the inclusion and exclusion criteria, 11 articles, identified in Table 3, were selected and analyzed.

Table 3 – Identification of the article, by title, database, country of the study, objective, study design/methodology, clinical activity of the dentist related to the ORHT, results and conclusion/final considerations.

	Title	DB	Country of the study	Objective	Study design/ Methodology	Clinical activity of the Dentist related to the ORHT	Results	Conclusion/ Final Considerations
A	A comparison of effectiveness between oral rapid testing and routine serum-based testing for HIV in an outpatient dental clinic in Yuxi Prefecture, China: a case-control study.	PubMed	China	Oral rapid HIV testing is a feasible and efficient approach in a clinical setting.	Employed a case–control study design and recruited dental outpatients into routine serum-based and oral rapid testing groups. Compared the acceptance, completion and result notification rate between groups Clinical research. Used ORHT (biological material was collected)	Yes. Clinical Practice	A total of 1574 patients (639 male, 935 female) participated in this study. None of the 57 patients who completed blood testing in the routine group received a positive result. Seven of the 784 patients who completed oral rapid testing received positive results, but only three were found to be HIV positive in the following confirmation test.	To compare the outcomes of routine provider-initiated HIV testing and counselling (PITC) and oral rapid HIV testing for dental clinic outpatients at a hospital.
B	A Qualitative Study of Rapid HIV Testing and Lesbian,	PubMed	USA	The purpose of this qualitative study was to document New York State dental directors'	Semi-structured interviews (N=10) were conducted with New York State dental directors practicing in areas of high	Yes. Acting as a researcher	Thematic analysis of the interviews revealed that many dentists	While potential facilitators such as test kit reimbursement and patient

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	Gay, Bisexual, Transgender, and Queer Competency in the Oral Health Setting: Practices and Attitudes of New York State Dental Directors.			perspectives and attitudes regarding issues relevant to the LGBTQ patient care and RHT.	HIV prevalence. A deductive and inductive qualitative approach was used to develop an interview guide, in accordance with the Theory of Planned Behavior, that elicited their perspectives, attitudes, and perspectives on ORHT and LGBTQ issues. Qualitative research. No use of ORHT		cited limited, if any, training and experience in RHT and LGBTQ patient care. Additionally, there was also an evident dichotomy between dentists who were offering RHT and dentists who were knowledgeable and well-versed in LGBTQ issues. Barriers to implementation included time constraints and minimal training and knowledge.	referral sources could enable LGBTQ and RHT training and uptake, actual implementation in the oral health setting will likely require additional training sessions, more involved collaboration with primary care providers, and an overall cultural change within the dental profession
C	Acceptability of oral rapid HIV testing at dental clinics in communities	PubMed	USA	We explored patients' acceptance of oral HIV rapid tests administered by dental providers and identified reasons for	During 2014 and 2015, dentists and hygienists at two federally qualified health center (FQHC) dental clinics who serve racial/ethnic minority	Yes. Clinical practice	Enrolled 600 patients (median age = 43 years; IQR: 29–56 years), 45% non-	Dental clinics may provide expanded opportunities for oral HIV rapid testing and conversations

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	with high HIV prevalence in South Florida.			acceptance or refusal of HIV testing.	<p>patient populations in South Florida were trained to administer oral HIV rapid tests as a part of a routine dental visit. Patients presenting for dental services were offered a rapid HIV test and brief survey regarding their demographics, HIV testing history and behaviors.</p> <p>Clinical research.</p> <p>Use of ORHT</p>		<p>Hispanic black and 35% Hispanic/Latino, 83% graduated high school, and 50% unemployed. Most (85%) accepted oral HIV rapid testing (none tested HIV-positive); 14% had never been tested for HIV. The most common reasons for testing were a desire to know HIV status (56%) and free testing (54%). Among 93 (15%) patients who declined testing, 58% had been tested recently and 31% felt confident that they were HIV-negative; however, 74 (80%) who</p>	<p>about HIV prevention in high HIV prevalent communities.</p>

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							declined testing said they would feel comfortable discussing HIV prevention with their dentist. Additionally, 290 of 600 patients (48%) reported condom-less vaginal or anal sex in the past 6 months. Further, among 119 patients who had condom-less sex with an HIV-positive partner and/or one whose HIV status was unknown, 98 (82%) accepted the oral HIV test.	
D	Attitude toward rapid HIV testing in a dental school clinic.//	PubMed	USA	Our study investigates patients' attitudes and willingness to participate in rapid HIV screening in a	This study examined patients' disposition to undergo a rapid routine HIV test, if offered in a dental office clinic. During fifteen days in 2011, an	No	In our survey, a total of 383 of 443 patients completed the questionnaire with 13.5% (n	Thus, dental school clinics versus private practice may be the optimal dental setting to

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				private dental school clinic. Furthermore, it aims to determine if the interest in participating in such a test demonstrates any gender or racial/ethnic differences.	<p>anonymous research containing demographic information and the desire to ask questions was offered to all the patients who were awaiting treatment. It is a pilot study. The size of the sample was too small to investigate interactions of age and race.</p> <p>Research with interviews, quantitative.</p> <p>No ORHT (no biological material collected)</p>		= 60) refusing to participate. The study population was composed of 164 males (42.8%), 208 females (54.3%), and 11 (2.9%) individuals who declined to state a gender. Responses were sorted by decade of age with fairly equal distribution in each decade between those in their 30s, 40s, 50s, and 60s (17.5%, 21.9%, 17.5%, 17.0%, respectively)	introduce HIV screening. In addition to providing training, dental school clinics can more efficiently provide referrals and link patients to further treatment. Among the dental care providers, dental hygienists are ideal candidates to conduct rapid HIV screening since they already provide patient management screening, assessing, planning and implementing an individualized patient care plan.
E	Australian dentists' perspectives on rapid HIV testing.	PubMed	Australia	Dentists have the necessary expertise and are well-placed for access by those sections of the population who would not normally access screening for HIV.	A cross-sectional online study was conducted in Australia during the period June to December 2013 among 532 dentists. The participants were recruited from the Royal Australasian	No	The study sample had an even distribution of male (51.3%) and female (48.5%) dentists. More	The majority of respondents were willing to provide RHT in their community settings. However, our data indicate that dentists

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					<p>College of Dental Surgeons, Australian Dental Association state branches, university dental schools, a dentistry symposium and dental hospital networks. To be eligible for participation the dentists had to be aged over 18 years, registered as a dental practitioner with the Dental Board of Australia and currently practicing dentistry (either part-time or full-time). There were no incentives or other forms of compensation for completing the survey. Ethics approval for the study was obtained from the University of Sydney (2013/88).</p> <p>Cross-sectional quantitative research online.</p> <p>Did not use ORHT</p>		<p>than one in three (39.1%) participants were aged between 40 and 59 years and a similar proportion (37.7%) had less than 10 years of dental experience. The majority of participants (73.7%) were in private practice and described themselves as non-specialists (76.4%). These results were slightly variant from the demographics of the current Australian dental profession, with 81.2% of dentists working in a private practice setting and</p>	<p>would need additional training in HIV medicine, test administration and giving reactive results.</p>

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							only 10% being specialists. ²⁶ About half (52.2%) did not treat people living with HIV on a regular and/or frequent basis. Demographic and professional characteristics of the participants are presented in Table 1. Most dentists (78.1%) felt uncomfortable about advising a patient of a reactive rapid HIV testing (RHT) result.	
F	HIV testing in the dental setting: perspectives and practices of experienced dental professionals.	PubMed	USA	This study sought to better understand the experiences of dental professionals who have administered the test and how these experiences might inform efforts to promote greater uptake of rapid HIV	Of the 42 participants interviewed (June 2010 – April 2014), 37 were dentists who had experience conducting HIV testing. The remaining five were dental hygienists who were interviewed when a dental practice offered	No	The majority of the participants were between 40 and 60 years old (average = 51), women (57%), caucasians	Finally, participants emphasized the need for a cultural change regarding how the dental field views its role as a primary care profession. While some recognized

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				testing in dental settings.	<p>testing by the hygienist only. Without any list of dentists offering HIV testing or a way to generate such a sampling frame, we identified participants from many independent sources (e.g., OraSure©) – and moved out from these cases using snowball sampling (Sadler, Lee, Lim, & Fullerton, 2010). Participants provided verbal informed consent, completed a 26-item, audio-taped interview via telephone, and received \$75. Names were not recorded. Institutional Review Board (IRB) approval was secured at Columbia University. Data Analysis: Two lead authors read one-half of the transcripts, and together developed a single provisional coding scheme. They then coded a small random sample of transcripts to assess and refine the coding scheme and add new codes. Once the coding scheme was</p>		(57%) and public/community health (64%). Twelve had applied HIV tests for less than one year, nineteen for one to three years, and ten for more than three years.	oral health as a component of comprehensive healthcare, many expressed concern about expanding the traditional view of the appropriate scope of dentistry. Increased awareness through dental education, advocacy from dental organizations, and enhanced integration of the medical and dental workforces may be necessary to engage the dental profession in primary medical screenings

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					finalized, two study team members independently applied it to all interviews. Qualitative research with use of ORHT			
G	Knowledge of HIV and willingness to conduct oral rapid HIV testing among dentists in Xi'an China.	PubMed /Scopus	China	We assessed willingness of dentists to undertake ORHT in their clinical practice.	A cross-sectional, paper-based survey of dentists from the Xi'an region of China was conducted from April to June 2013. Dentists were recruited from Shaanxi Stomatological Association using a stratified sampling methodology. A 40-item survey was used to measure knowledge of HIV, attitudes toward people living with HIV and willingness to conduct ORHT. Cross-sectional survey. Did not use ORHT	No	477 dentists completed the survey with a mean HIV knowledge test score of 13.2/18 (SD 1.9). If made available in the dental setting, 276 (57.9%) preferred to use blood to diagnose HIV, only 190 (39.8%) preferred saliva or both. Four hundred and thirty-five (91.2%) thought that ORHT was needed in dental clinics. Female dentists felt more accepting of	The majority of Chinese dentists thought that ORHT was needed in the dental setting. Providing opportunities for dentists and dental students to learn about HIV testing guidelines and practices is needed as well as feasibility and implementation science

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							<p>ORHT than males (93.8% vs. 87.8%; $\chi^2=5.145$; $p<0.05$). 42.6% of the participants who responded thought that lack of education on ORHT for dentists was the most urgent problem to solve for ORHT, 144 (31.3%) thought that lack of support for ORHT from patients was the most urgent problem. There was a statistically significant difference between dental hospital, dentistry and department of</p>	

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							dentistry ($\chi^2=24.176$; $p<0.05$).	
H	Oral Rapid HIV Testing: Implementation experiences of dental hygiene faculty and students.	PubMed / Scopus	USA	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	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. Qualitative research with use of ORHT	No	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 in the scope of their practice; dental hygienists have the skills to feel comfortable offering ORHT without judgement; training is needed with ORHT administration, reading/discus	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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							<p>sing 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 rendered results, and convenient since they were already in the dental setting.</p>	
I	<p>Patients' Willingness to Participate in Rapid HIV Testing: A pilot study in three New York City dental hygiene clinics.</p>	PubMed	USA	<p>The purpose of this study was to investigate patient acceptance, certainty of their decision, and willingness to pay for screening if RHT was offered in university-based dental hygiene clinics</p>	<p>A cross-sectional survey was administered to 426 patients at three dental hygiene clinics in New York City over a period of four months. The survey questionnaire was based on the decisional conflict scale measuring personal perceptions; with zero indicating extremely high conflict to four indicating</p>	Yes	<p>Over half (72.2%) indicated acceptance of HIV testing in a dental hygiene clinic setting; with 85.3% choosing oral RHT, 4.9% fingerstick</p>	<p>Patients are willing to undergo oral RHT when offered as a service and provided by dental hygienists in the dental setting. Patients appear to be aware of the benefits and risks associated with</p>

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					<p>no conflict. Patients were assessed for their acceptance of RHT, provider preference for administration of the test and their willingness to pay for RHT.</p> <p>Cross-sectional clinical research.</p> <p>ORHT use</p>		<p>RHT, and 8.8% venipuncture. Respondents were amenable to testing when offered by dental hygienists (71.7%) and dentists (72.4%). Over 30% indicated their willingness to receive HIV testing in the dental setting when offered at no additional cost. The mean decisional conflict score was 3.42/4.0 indicating no decisional conflict.</p>	<p>RHT. Further research is needed to evaluate the public health benefits and logistical challenges facing the delivery of RHT within in the dental setting.</p>
J	Results of offering oral rapid HIV screening within a dental school clinic.	PubMed	USA	The aims of the study were to assess the acceptance of oral rapid HIV screening in a dental clinical setting and to screen for, educate and refer	<p>Prospective cross-sectional clinical research</p> <p>Used ORHT and blood sample</p>	Yes	The 319 (39.3%) agreed to be tested and identified themselves as hispanics	The confirmed incidence rate finding of HIV seropositivity of 0.31% found through initial screening at the

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				undiagnosed HIV patients. The research question was to measure the prevalence of HIV in a dental clinic and to compare the profiles of those who agreed to be tested with those who declined.			(34.4%), white (25.8%), afro-americans (13.1%), asiatics (8.3%), indigenous / Pacific islands (0.9%), more than one race / ethnicity (1.1%) or declined to answer (16.5%). More than 35% (n = 113) were the first to do the HIV test, with another 2.2% (n = 7) who did not know their history of tests..	dental clinic, compared with the 0.018% incidence rate of HIV with confirmed diagnosis in LAC, indicates that a rapid HIV screening test for previously undiagnosed patients is needed and that a dental school clinic can provide an important nontraditional site for patients to be tested for HIV.
K	Transgender HIV status, self-perceived dental care barriers, and residents' stigma, willingness to treat them in a community	PubMed	India	Assess the association between high risk transgender (TG) HIV status, self-perceived barriers to oral care, and the residents' stigma and willingness to treat during community dental outreach.	A multicenter cross-sectional study was conducted among 212 TGs and their respective resident allocated to provide dental care in a mobile dental unit from June 2016 to November 2016 on the outskirts of Pondicherry and Tamil Nadu. The study was approved by the	No	Overall, 88% had begging as their sole income, and 93% lived in slums and used some form of tobacco. Oral health was perceived to be poor by	The self-perceived oral health of transgender persons was poor corresponding to the clinical examination findings. Moreover, the stigmatizing attitude and low regard to provide

	Title	DB	Country of the study	Objective	Study design/ Methodology	Clinical activity of the Dentist related to the ORHT	Results	Conclusion/ Final Considerations
	dental outreach program: Cross-sectional study.				<p>institutional review board, following which the local association of the 'Hijras/Aravani' was approached and the purpose of the study explained to the caretaker. This association is basically a dedicated rehabilitation center for TG who are drug addicts, sex workers, people living with HIV/AIDS (PLWHA), and those with suicidal tendencies.</p> <p>Multicenter cross-sectional study</p>		<p>more than half, and the mean probing pocket depth (PPD) and decayed, missing, or filled teeth (DMFT) was 4.2 mm and 3.67, respectively. The residents reported significantly low regard for and willingness to treat TG irrespective of high/low stigma and when the transgender HIV status was positive/do not know. Residents with greater fear of exposure expressed least regard and willingness to treat TG ($P < 0.05$)</p>	<p>oral care is rampant among the dental residents, which further frustrates dental care.</p>

Discussion

The studies identified in the Review show that the ORHT is undertaken in the private offices and clinics and in public services, in various countries^{14, 16, 21-26}.

There is agreement among the users of the dental clinics in general, that there exist both ease of application and practicality for the application of the ORHT for the purpose of testing for HIV in these places. Because of the relation of proximity between the dental surgeon and their clients, associated with the privacy of the clinic, the subject of the application of the ORHT may be raised more easily there. A study of Alves Rezende et al.²⁷, undertaken in 2015, showed that empathy is important for the promotion of health, contributing directly to the best results in terms of the treatment proposed.

For the public of lesbians, gays, bisexuals, trans-sexuals and their sympathizers the dental clinic is an appropriate, private place for the test, because it guarantees the individuality of gender^{23, 28-29}. Two of these studies, both conducted in American clinics^{14, 26}, state that, on their part, the dental surgeons feel that they are prepared to collaborate in the application of the ORHT to those who do not know their serological situation and who might have HIV. They take into consideration the importance of the technique of buccal hygiene in helping with and carrying out the ORHT.

Bradley et al.²², in a study financed by the *Centers for Disease Control and Prevention* (CDC) of the USA, understand that dental clinics can provide greater opportunities for oral rapid HIV tests and conversation about the prevention of HIV in communities with a high prevalence of HIV. The study covered 600 patients with a median age of 43 years and obtained acceptance for the application of the ORHT on the part of 85% of them, 14% never having previously undergone the test. Among those who refused to undergo the test, they said they felt at ease to discuss the prevention of HIV with their respective dentists. It is important that the study identified 119 patients who practiced unprotected sex with a seropositive partner and/or with persons whose serology was unknown.

The ORHT is being applied in dental schools and in dental clinics which permit the study and practical learning of this diagnostic technique. Secondly, according to studies undertaken in China and the USA, the dental school can inculcate new values for the dental sector which may contribute to this preventive action because it is the ideal place for the implementation of this technology in its future work, revealing barriers and prejudices and act, directly, to ease the educational process, fulfilling a fundamental role in the advance of public health^{24, 30}.

The study of Shifu et al.²¹ conducted in dental clinics in China showed that dentists diagnosed oral diseases on the basis of the initial symptoms of AIDS such as oral candidiasis, herpes zoster, herpes simplex, oral bacteria, or fungus infection and recurring mouth ulcers and proceeded with the treatment after the application of these tests.

Since 2006, dental clinics have been included as appropriate places for the screening of ORHT in the USA. In Kansas City, Missouri, a study was undertaken in a dental clinic which attended a diverse population and the test was applied free of charge during the dental visit. The attitudes of the patients with regard to the test were positive - providing no additional charge was added to that of the treatment. The principal reasons for not wanting to do the test were related to the fact of their having taken the test in other places and to the low perception of risk. In general, the patients agreed that the dental office is a viable option for the ORHT and for becoming acquainted with their serological status³¹.

In the study of Suarez-Durall et al.²⁴, 60.2% of the persons researched were not disposed to do the rapid test on the date agreed, for undeclared reasons. Four undiagnosed possible infections were identified in the same study, according to a structured algorithm. The rate of incidence of seropositivity for HIV of 0.31% found in the initial screening, showed that the dental clinic is an important place for the discovery of persons with hitherto undiagnosed HIV. The study of Moreschi et al.³² showed that there is some concern among dental surgeons as to the possibility of an accident with a perforating and cutting material and the possibility of infection.

As one difficulty regarding the application of the TRO, there are dentists who express fear and prejudice in the light of the possibility of dental treatment together with the application of ORHT in their clinics, especially when a positive result for HIV appears^{16, 25, 29}. Even though it has been more than 30 years since the outbreak of the HIV epidemic, the most common motives are lack of information, absence of the technical ability to deal with the infection, inappropriate structure of the health unit, uncertainty, and fear of contamination³³.

The discrimination and prejudice present among dentists also lead to difficulty in their adhesion to the treatment of oral health and interfere directly in the quality of life of their seropositive patients. Professionals who are prepared, by way of Permanent Education, and who have experience in the handling of dental treatment of HIV positive patients, are better able to deal with this population³⁴.

The article of Bradley et al.²² describing research undertaken in the south of Florida, raises questions related to the cost of the application of the ORHT, such as the fact of the test's not being made available by the public sector. The dental clinic

assumes this cost which will then have to be covered by the client, which creates a barrier to the ORHT being implanted in the clinics. In fact, according to Davide et al.²⁶, more than half the patients (72.2%) agreed to do the HIV test at a dental hygiene clinic, in the city of New York (USA), though more than 30% said they agreed to do the HIV test in the dental setting, provided there was no additional cost.

Dental professionals in partnership with those of public health can collaborate with the expansion of the application of the HIV tests, by means of training courses which perfect their knowledge and result in their acceptance of patients with HIV, which permit the use of the ORHT, including the possibility of repayment for the tests which would contribute to their application²².

The same article discusses the point that beyond the financial gains, there will also be an increase in the professionals' resulting work load²².

Siegel et al.³⁵ state that a cultural change, beginning in the dental schools, may prove to be necessary to involve dentists more actively in primary prevention and in the HIV selection process by means of the oral rapid tests. In this qualitative study, 174 professionals participated but only 40 dentists replied to the questionnaires, thus showing that the majority were worried about the fact that the time taken in applying the HIV test would not be adequately covered by an equivalent financial compensation, and commented that applying the HIV test would increase the time spent by the patient in the dental chair and would thus affect the productivity of their dental work negatively. On the other hand, other colleagues saw the HIV test as a service that they wished to offer their patients, regardless of the level of compensation. Some participants in this study commented that dentists generally resist carrying out new tasks.

Feinstein-Winitzer et al.³⁶ discovered that the odontological setting is ideal for the application of preventive exams for HIV, even with all the difficulties to be faced by the professional personnel, for the repayment by insurance companies. Preventive exams such as those for oral cancer had their repayment guaranteed, which has not yet happened with the oral rapid test for HIV, applied during dental treatment. Among the difficulties for the receiving of repayment were emphasized: the minimal number of persons available to apply the test, the limited evidence of the test's efficacy, the return on the investment for the dental setting, and the lack of training of the supplier of the test, which create a barrier to the application of the test in dental offices.

Parish and Santella²⁸, through a dental association, conducted a study selecting dentists to act as participants in the research and investigate the application of the oral rapid test to the attitudes and behavior of the LGBT population, in the ORHT and relate it too to oral health.

In Brazil, the application of the ORHT is not an established practice in private dental offices. However, counselling is undertaken as a practice in the public health services, in multidisciplinary teams, as for example when the dentist faces up to the problems involved in a possible positive result to the HIV test³⁷.

The most recent studies published in Brazil on the ORHT theme date from the decade of the 2000s, and there has been no later up-dating. The study of Telles-Dias et al.³⁸ on a population of injectable drug users showed the viability of the use of rapid tests, preferably oral tests, as they are painless, trustworthy, and allow the user to ascertain their serological situation and begin adequate treatment if they are seropositive.

In Brazil, dental surgeons, it was discovered that Aids continues to inspire fear and prejudice among them, thus hindering attendance to bearers of HIV. There is still a lack of knowledge regarding the development of the disease and the forms of treatment and prevention. They do not always use the equipment for personal protection, the principal means for protection to be used in their activities to avoid contamination, adequately.

Strategies for the inclusion of dental surgeons in the prevention of HIV do exist, as reported in the city of Fortaleza, in a joint action bringing together the Oral Health of the Municipal Bureau of Health and the Coordination of Viral Hepatitis and DST/Aids. The action sought to broaden the knowledge of dental professionals and their attendance on persons who live with HIV/aids. This experiment, published as a study, showed that the professionals did not feel themselves apt to attend to this population, the main motives for the refusal being: lack of information and of technical training, a lack of structure at the health units, insecurity and fear of contamination³³. According to the authors, the strategies which could modify that mentality are based on the improvement of the structures of the places where the services are offered, educational up-dating, concepts of bio-security and the humanization of the means of health as a means of facing the stigma of aids for the adequate treatment of oral health.

Rocha et al.³⁷ call attention to the fact that dentists are little involved in the ORHT for HIV, because they do not feel they are prepared to address the needs of the users and that is why the responsibility for applying it is delegated to the nursing team. The study shows that the rapid testing is not in the hands of the health team which calls attention to the lack of security related to risk management and of emotional support in dealing with seropositive results.

In Brazil, article two of the Code of Dental Ethics recommends that the activity of the dentist should be exercised for the benefit of the health of the human being, of

the collectivity and of the environment, with no discrimination of any sort or on any pretext³⁹.

Permanent education and humanization in odontology permit a better view in the clinical attendance dedicated to the persons who are carriers of HIV, thus guaranteeing the exercise of the profession without prejudice, stigma or stress³³.

It is to be hoped that the diagnosis of aids would not lead to excessive care or changes of behavior in the dentist-patient relationship seeing that the bio-security protocols train the professional to guarantee the physical integrity of both⁴⁰. This study showed that the stigma of aids led 55% of the participants to deny they were seropositive as a way of guaranteeing that the integrity and effectiveness of the dental treatment would not be affected. Patients reported that after they had revealed their seropositive condition they perceived a change of posture in the attendance given, probably due to a lack of information on the part of the professional (20%) and the fear of contamination (7%) of HIV⁴⁰.

The dentists occupied an important position in the diagnosis of HIV, because they provide care for the oral health of many persons who do not frequent the health system's facilities regularly and because of the ease and confidence in the oral rapid test. This can guarantee the spread and activity of the dental surgeon⁴¹.

VanDevanter et al.⁴², in a qualitative study of the attitudes of patients to the HIV test in a dental office reported that the patients told of their ready acceptance of the test, because they showed themselves to be very willing to undergo the HIV screening in view of its ease of access, acceptance and approval of the application. It also offers great testing potential and reaches millions of people annually by means of rapid kits even though they do not come within the scope of normal dental practice. However, few dentists and few academic dental centers have incorporated HIV screening in practice.

Technical and scientific advances have resulted in greater ease of application and trustworthiness in the recommendation of the rapid tests, especially those for HIV infection. Rapid tests use the response to HIV antigens resulting from oral secretions or total blood⁴³. In May 2012, the Food and Drug Administration (FDA) of the United States approved the first test kit *in vitro* for the diagnosis of HIV (HIV-1 and HIV-2), to be applied at home using oral fluid, OraQuick® In-Home⁴⁴, manufactured by OraSure Technologies. This oral test uses a swab for samples of the gum fluid in a test making use of ELISA screening. There were false negative results in acute cases and also due to the non-participation of duly trained individuals. The reactive tests require confirmation of their results, as in all the exams. In the last 25 years, the tests for HIV have undergone an ample and meaningful expansion of recommendations in view of

factors such as improvements in technology, the nature of the epidemic and the acceptance by infected persons^{41, 45-47}.

Hutchinson et al.⁴³ have made it clear that the viability of the test in a dental setting - as a routine test, can guarantee a reduction in the rates of HIV infection. Limitations of a practical sort, such as repayment, can be administered in the light of the benefit to clients, and health professionals with a broad education in HIV will succeed in improving the health of the community.

According to Pollack et al.¹⁵ the diagnosis of HIV is an imperative for public health. New recommendations give guidance on actions for HIV testing as part of a routine series of health care measures in all settings, including oral tests which can be applied at home. The health services offer greater advantages for the diagnosis of HIV as they provide the patient with a welcoming reception, education and general support. The health professionals of the dental community are in a key position for the diagnosis of HIV, due to their routine care for the individuals who, frequently, do not attend the health system's facilities but have access to the dental services safely and regularly. Thus the oral rapid test for HIV is appropriate for the dentist's office¹⁵.

Even though there exist barriers to be faced – such as the lack of inclination on the part of dentists to offer the screening for the test and their perception of its acceptance by their patients, these attitudes should be evaluated before the application so that they do not become obstacles¹⁵.

Pollack, Metsch and Abe⁴⁸ reported that 70% of the individuals at risk of infection by HIV had visited a dentist within the previous two years. The routine tests present ample benefits both personal, professional and social and can result in substantial reductions in HIV infection.

HIV screening for oral fluids was described as having benefits for patients, dentists and for the public good. Barriers to the implementation of the test can be dealt with by training and interdisciplinary collaboration⁴³.

Conclusion

The literature review evidenced the action of dental surgeons in relation to the ORHT, and the fact that in Brazil actions are being undertaken in the public health services in the multi-professional context which could be expanded, leading to the greater outreach of the activity, by the offer of the application of the ORHT in dental offices and clinics inclusive, with the greater involvement of the dentists.

The dentist's office provides a favorable and appropriate context for this as it is dedicated to the treatment of health. If the dental surgeon is duly trained, he can attribute a new significance to the paradigms of the behavior of HIV-positive and negative patients, contributing to the application of the ORHT, with a precise diagnosis which respects the patient's individuality, with the necessary follow-up which will, in its turn, also reduce the comorbidity rates for aids.

The dental surgeon can act directly on this interface of the implementation of the ORHT in dental offices and clinics, having the 90-90-90 target in view that, beyond expanding the treatment can contribute meaningfully to public health with early diagnosis and treatment, increase longevity and an improvement of the quality of life of the persons who live with HIV-related infections.

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a. Defining the Role of Authors and Contributors

For the preparation of the manuscript, the authors contributed with the following parts:

Katia Ferreira dos Santos:

- Data collect
- Analysis and interpretation of data
- Preparation of tables
- Analysis of results
- Development Discussion
- General Development of the text
- Conclusion

Lucia Yasuko Izumi Nichiata:

- Contributed to the general orientation of work
- Statistical analysis and data conference
- Preparation of tables
- Development discussion
- General Interpretation of results

b. Competing Interests

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