Thai Dental Practitioners' Knowledge and Attitudes Regarding Patients with HIV

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Abstract: To investigate the knowledge and attitudes of Thai dental practitioners regarding patients with HIV, a cross-sectional study using self-administered questionnaires was conducted. The questionnaires requested demographic information and included questions evaluating the knowledge and attitude of dental practitioners towards HIV. The results were analyzed using Scheffe method for multiple comparisons at the 95 percent confidence level. Out of 1,200 questionnaires sent, 446 questionnaires were returned (response rate 37.2 percent). The subjects included final (sixth)-year dental students (11.9 percent), general dentists (29.1 percent), specialist dentists (15.5 percent), dental hygienists (30.5 percent), and dental assistants (13 percent). More than 80 percent of the dental practitioners correctly answered the questions testing their basic knowledge of HIV such as routes of transmission and common opportunistic infections. However, knowledge about HIV pathogenesis, complications, and advances in HIV management was lacking. Dental hygienists and dental assistants had statistically significant lower scores in knowledge about HIV than other groups. Sixty-seven percent of dental practitioners said they feel worried when treating patients with HIV, and 20.4 percent said they would deny treatment for patients with HIV if possible. While knowledge about HIV may be adequate among dental practitioners in Thailand, greater effort should be put into emphasizing positive attitudes towards patients with HIV.

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Infection by Human Immunodeficiency Virus (HIV) has led to severe health and socioeconomic problems worldwide. Acquired Immunodeficiency Syndrome (AIDS) has been a major health problem in Thailand since the 1990s.[1] The country's strong effort to promote a national campaign in the prevention and control of HIV has led to a decline in incidence from 143,000 in 1991 to 19,000 in 2003.[1] In addition, the introduction of Highly Active Antiretroviral Therapy (HAART) since 2000 has resulted in a drastic reduction of opportunistic infections and complications in people with HIV.[2-4] The nation's AIDS prevalence rate was reduced from 1.8 percent in 2003 to 1.4 percent in 2007.[5] The estimated number of people living with HIV in Thailand at the end of 2009 was 530,000.[6] People with HIV/AIDS are now living longer and with better health and quality of life.

Despite HAART, people with HIV still carry a high burden of oral health problems. These problems include periodontal disease, dental caries, dry mouth, aphthous stomatitis, and lack of dentition.[7-9] Even though not serious health problems, they still have a major impact on these individuals' quality of life. Contributing factors to the poor oral health seen in people with HIV include side effects of the medications, negligence, and financial problems, among others.[9,10] Interestingly, our previous study and another study found that people with HIV were reluctant to seek dental care and disclose their HIV status to dental professionals.[9,11] Some patients reported that a dentist refused to care for them because of their HIV status.[9]

Studies in many countries suggest that an important factor in the oral and dental health care of people with HIV is the attitude and knowledge of dental practitioners about HIV.[12-20] A negative attitude and lack of knowledge in dental practitioners towards people with HIV can lead to substandard or delayed treatment or even denial of treatment for these patients.

Currently, there are eight government-owned dental schools in Thailand with approximately 600 graduates each year. There are now 9,337 registered dentists working in private dental clinics, private dental hospitals, public hospitals, and dental schools all over Thailand.[21] Other dental associates such as

dental hygienists and dental assistants comprise about 30 percent of the dental professionals in Thailand (a total of 3,996).[21] It is predicted that a good number of these active dental practitioners in Thailand are not aware of up-to-date information about HIV and its management. Classes in some dental schools still concentrate primarily on the appearances of oral opportunistic infections. This remains important in many cases, but current knowledge about HAART and its ability to improve the quality of life for people with HIV is still underappreciated. One study, performed in southern Thailand more than ten years ago prior to the introduction of HAART, showed that an educational intervention that emphasized appropriate knowledge and attitude in dental practitioners led to improved knowledge, attitudes, and practices regarding HIV/AIDS.[22] To date, there has been no study about this in a large dental practitioner population in Thailand. The aim of our study was therefore to evaluate Thai dental practitioners' current knowledge of and attitudes towards HIV. The information gained from this study will be useful for future policy planning for dental treatment for people living with HIV in Thailand and educational reform in Thai dental schools on this subject.

Materials and Methods

This study was a cross-sectional study conducted from August 2009 to May 2010 using self-administered questionnaires mailed to dental health professionals in Thailand: dentists, dental hygienists, dental assistants, and final (sixth)-year dental students. Detailed information for the study population was as follows. The students were final (sixth)-year dental students from six government-owned dental schools in Thailand: Srinakharinwirot University, Chulalongkorn University, Thammasat University, Naresuan University, Chiang Mai University, and Khon Kaen University. The first three universities are located in Bangkok and surrounding suburbs. The latter three universities are located in the middle, northern, and northeastern parts of Thailand, respectively. The general dentists were all dentists who graduated with a Doctor of Dental Surgery degree from dental schools in Thailand without any postgraduate dental training. Specialist dentists were dentists who had completed or were currently undertaking postgraduate dental training programs. Dental hygienists and dental assistants were those registered in the national database.

The questionnaires collected demographic information from the subjects and asked them to answer questions evaluating their knowledge of and attitude towards HIV. Numbers of questionnaires required were calculated based on non-probability sampling (purposive sampling). A total of 1,200 questionnaires were mailed to twenty out of seventy-seven Provincial Health Offices throughout Thailand and six out of eight government-owned dental schools. They were also distributed at national dental meetings. Total knowledge scores were calculated from each question (one point for each correct answer). The data analysis was performed using SPSS version 16. The differences of total knowledge scores between groups of dental practitioners were analyzed using Scheffe method for multiple comparisons at the level of 95 percent confidence. A p-value less than 0.05 was considered statistically significant. Questions evaluating attitude were analyzed descriptively in percentages. The study protocol was approved by the Institutional Research Board on Human Studies of the Faculty of Dentistry, Srinakharinwirot University.

Results

There were approximately 15,000 registered dental practitioners in Thailand during August 2009 to May 2010, detailed as following: 9,337 registered dentists, 3,966 dental hygienists and dental assistants, and approximately 600 final (sixth)-year dental students. The expected numbers of the study population were calculated using non-probability sampling (purposive sampling) technique with Taro Yamane formulation as follows:

$$n = \frac{N}{1 + Ne^2} = \frac{15{,}000}{1+(15{,}000 \times 0.05^2)}$$

$$= 390 \text{ (number of correspondences we should receive)}$$

(n=sample size; N=total population=15,000; e=error of sampling method)

From 1,200 questionnaires sent, we received 446 questionnaires back (response rate 37.2 percent). From all populations, there were 105 male (23.4 percent) and 341 female (76.6 percent) respondents (Table 1). The ages ranged from twenty to fifty-nine years, and the mean age of the study population was 32.51±9.16 years. The subjects included final (sixth)-year dental students (11.9 percent), general dentists

Table 1. Demographic details of study population

	Percentage
Gender (N=445)	
Male	23.4%
Female	76.6%
Organization (N=416)	
Government	84.8%
Private practice	14.8%
State enterprises	0.4%
Status (N=446)	
Sixth-year dental students	11.9%
Dentists with DDS degree (general dentists)	29.1%
Dentists with higher than DDS degree (specialist dentists)	15.5%
Dental hygienists	30.5%
Dental assistants	13.0%
Location (N=375)	
Bangkok and suburban regions	28.3%
Northern	5.1%
Central	17.3%
Northeastern	26.4%
Western	6.4%
Eastern	5.6%
Southern	10.9%

Note: The age of the respondents (N=445) ranged from twenty to fifty-nine years, with an average of 32.51±9.16. Percentages may not total 100% because of rounding.

(29.1 percent), specialist dentists (15.5 percent), dental hygienists (30.5 percent), and dental assistants (13 percent). Regarding the workplace, 84.8 percent of dentists, dental hygienists, and assistants worked in government organizations. The rest worked in private practice (14.8 percent) and state enterprises (0.4 percent). Respondents from Bangkok and surrounding suburbs accounted for 28.3 percent, and other provinces accounted for 71.7 percent of the returned questionnaires.

More than 80 percent of the respondents correctly answered the questions testing their background knowledge of HIV such as routes of transmission and common opportunistic infections (Table 2). However, only 10-30 percent correctly answered the questions on knowledge about HIV pathogenesis, complications, and advances in HIV management. Most correct and incorrect responses to selected statements are shown in Table 3 with percentages according to each group. When comparing total knowledge scores among groups of dental practitioners, we found that total knowledge scores of dental hygienists and dental assistants were statistically significantly lower than those of other groups, but did not differ from each other (Table 4).

The questions on the attitudes of dental practitioners towards HIV revealed several interesting points (Table 5). First, 95.3 percent of all respondents answered that they use strict sterilization procedures when treating patients. However, even with universal precautions, only 73.8 percent of them felt that there was no need for additional sterile techniques when treating patients with HIV, and only 65.9 percent trusted the sterilization processes in their practices. Also, 18.4 percent felt it was not necessary to inform their dental assistants that a patient was HIV-positive as long as universal precautions were applied. Moreover, 96.6 percent of the respondents felt appreciative when patients notified them of their HIV-positive status prior to treatment, but 67 percent felt worried when treating patients with HIV and 20.4 percent said they would deny treatment for patients with HIV if possible. Interestingly, 41.9 percent said they would feel angry if a patient informed them he or she was HIV-positive after the treatment. When descriptively analyzing the answers among various groups of dental practitioners, we found that final-year dental students, dental hygienists, and dental assistants had a high percentage of answers that suggested "negative" attitudes towards dental treatment for patients with HIV (Table 6).

Discussion

Due to advances in treatment of HIV infection, people with HIV are now living longer. Patients who are well controlled on HAART with very low levels of viral load and high numbers of CD4 in the plasma pose very little risk of transmission to the health care professional who uses universal precautions.[23,24] As part of the health professional team, it is important for dental practitioners to be aware of a new era for dental management for people living with HIV.

Knowledge and attitude of dental practitioners towards HIV has been studied in several countries and revealed surprising results. Dental practitioners have been found to have discriminatory attitudes that potentially affect dental treatment for patients with HIV.[12-20] Our study attempted to study the knowledge and attitudes of Thai dental practitioners about HIV and patients with HIV in Thailand. To our knowledge, this is the largest study of this topic in Thailand. We randomly selected the population and distributed the questionnaires throughout the country. Even

Table 2. Statements evaluating knowledge of HIV and percentage of correct responses to each

Statement	Percentage of Correct Responses
1. Regarding knowledge about HIV pathogenesis:	
1.1. There are two main HIV subtypes, HIV-1 and HIV-2.	39.9%
1.2. Type of HIV infection associated with Thai population is HIV-2.	10.1%
1.3. The key enzymes for HIV pathogenesis are integrase, reverse transcriptase, and protease.	35.9%
1.4. HIV infects and destroys CD4 T-lymphocytes leading to immunodeficiency state and increased risk of opportunistic infections.	83.9%
2. Regarding knowledge about HIV transmission:	
2.1. One cannot contract HIV by contact if there is no open wound.	65.6%
2.2. The chance of contracting HIV in a dental practice setting is much lower than contracting Hepatitis B virus.	86.6%
2.3. HIV can be transmitted via four major routes: sexual transmission, intravenous drug injection, blood transfusion, and mother-to-fetus transmission.	92.4%
2.4. Infant can contract HIV from mother via placenta, blood, and during delivery but not from breast milk.	45.5%
3. Regarding knowledge about manifestations of HIV:	
3.1. The most common fungal infection found in oral cavity that correlates with the status of HIV infection is oral candidiasis.	85.4%
3.2. HIV-associated candidiasis is limited to pseudomembranous candidiasis only.	50.7%
3.3. Periodontal diseases related to HIV are linear gingival erythema and necrotizing ulcerative periodontal diseases.	48.8%
3.4. Patients with HIV usually experience dry mouth due to side effects from antiviral drugs.	56.4%
3.5. Malignancy most commonly associated with HIV in Thai population is leukemia.	34.7%
3.6. The reduction of CD4 T-lymphocytes due to HIV infection (usually when CD4 level is lower than 200 cells/mm^3) increases the risk for developing opportunistic infection in the patient.	61.9%
4. Regarding knowledge about post-exposure prophylaxis:	
4.1. If one accidentally gets a needlestick, one should promptly scrub hands with soap and rinse thoroughly with water.	77.7%
4.2. HIV screening test, which is the test for HIV antibody, is sensitive, fast, and gives 99.5% reliability. However, a confirmatory test is required once positive result is obtained from screening test to ensure one has HIV.	64.4%
5. Regarding knowledge about the current treatment protocol for HIV:	
5.1. Antiviral drugs used in Thailand for HIV are combination of three types of drugs.	35.2%
5.2. Antiviral drugs usually are prescribed to patients when their CD4 counts become lower than 200 cell/mm^3 and patients with opportunistic infections with CD4 counts lower than 250 cell/mm^3.	37.9%
5.3. Individuals with HIV need to take their antiviral drugs on schedule every day.	68.1%

though it covered less than 10 percent of each group of the population (8.83 percent of final-year dental students, 2.13 percent of dentists, and 4.85 percent of dental hygienists and dental assistants), this study revealed several important points that could impact the improvement of dental management and attitude towards people with HIV.

Our results suggest that dental students and dentists have overall better knowledge about HIV than dental hygienists and dental assistants. In addition, while these dental practitioners have good general knowledge about HIV transmission and early signs of AIDS, knowledge regarding HIV pathogenesis and current treatment protocols for patients with HIV is still lacking among them. To our surprise, even though 86.5 percent of these dental practitioners gave correct responses about HIV transmission in the dental setting, 10-30 percent of them responded that they would deny giving treatment to patients with HIV. The alarming finding was that a high percentage of the final-year dental students had negative attitudes towards treating patients with HIV despite having the second highest total scores for knowledge questions. This could be because of their inexperience and lack of confidence to perform treatments effectively without accidents.

Similar inconsistency between knowledge and attitude has been reported in other studies, suggesting that knowledge is not the only factor that affects negative attitudes towards patients with HIV.[12,15,20] McCarthy et al. reported that the refusal to treat patients with HIV may be due to fear of losing other

Table 3. Most correct and incorrect responses to selected statements, by percentage of each group

Statement	Percentage of Total Correct Responses	Percentage of Correct Responses by Group				
		Dental Students	General Dentists	Specialist Dentists	Dental Hygienists	Dental Assistants
HIV can be transmitted via four major routes: sexual transmission, intravenous drug injection, blood transfusion, and mother-to-fetus transmission.	92.4%	0	92.3%	97.1%	88.2%	89.7%
The chance of contracting HIV in dental practice setting is much lower than contracting Hepatitis B virus.	86.5%	98.1%	91.5%	94.2%	80.2%	70.7%
The most common fungal infection found in the oral cavity that correlates with the status of HIV is oral candidiasis.	85.4%	98.1%	95.4%	94.2%	82.9%	48.3%
HIV infects and destroys CD4 T-lymphocytes leading to immunodeficiency state and increased risk of opportunistic infections.	83.9%	92.5%	90.8%	95.7%	71.3%	75.9%
If one accidentally gets a needlestick, one should promptly scrub hands with soap and rinse thoroughly with water.	77.6%	71.7%	83.1%	81.2%	77.9%	65.5%
The key enzymes for HIV pathogenesis are integrase, reverse transcriptase, and protease.	35.9%	64.2%	41.9%	49.3%	20.9%	15.5%
Antiviral drugs used in Thailand for HIV are combination of three types of drugs.	35.2%	39.6%	46.2%	59.4%	21.3%	10.3%
Malignancy most commonly associated with HIV in Thai population is leukemia.	34.7%	52.8%	41.9%	47.8%	23.7%	12.1%
Antiviral drugs usually are prescribed to patients when their CD4 counts become lower than 200 cell/mm^3 and patients with opportunistic infections with CD4 counts lower than 250 cell/mm^3.	31.9%	45.3%	40.0%	49.3%	31.6%	27.6%
Type of HIV associated with Thai population is HIV-2.	10.1%	11.3%	9.2%	15.9%	9.6%	5.2%

Table 4. Percentage of total knowledge scores among groups of dental practitioners

Group	Percentage of Total Scores of Knowledge
Sixth (final)-year dental students	61.6%
General dentists	58.7%
Specialist dentists	63.7%
Dental hygienists	47.0%*
Dental assistants	41.4%*

*Statistically significant at $p<0.05$ by multiple comparisons.

patients from the practice, difficulty dealing with staff members' fears about HIV transmission, fear of increased personal risk of contracting HIV, and the financial burden of infection control procedures.[25] A study by Leuveswanij et al.[22] of 103 oral health practitioners in Thailand found that an educational intervention regarding HIV resulted in a significant improvement in knowledge and practice of dental treatment for patients with HIV. However, their study suggested that further improvements in attitudes towards HIV were still needed even after the educational intervention. In addition, a study by Corrigan at al. suggested that negative attitudes towards a person with a difficult condition, such as patients with HIV, could be lessened with face-to-face contact.[26] These findings highlight the need to include classes or workshops regarding knowledge of and attitude towards HIV or other infectious diseases in the dental curriculum. More importantly, the ethical responsibility to treat all patients in need should be emphasized.

The results from our study were in accordance with previous studies that found dental practitioners had a fear of contracting the disease and had discriminatory attitudes towards patients with HIV.[12-20] Interestingly, a study of the attitudes toward dental treatments in Thais with HIV also showed that the patients feared being denied dental treatment if they revealed their HIV-positive status to the dentist.[9] Even if patients believed that dental practitioners, like other health care workers, had good knowledge

Table 5. Respondents' attitudes towards HIV, by percentage of agreement with each statement

Statement	Percentage of Agreement
1. Statements evaluating confidence with sterilization process:	
1.1. You strictly follow sterilization process for your patients.	95.3%
1.2. You believe that universal precautions are enough to prevent disease transmission in dental practice.	73.8%
1.3. There are multiple levels of sterilization to utilize, depending on the level of infection.	40.8%
1.4. You always treat all patients with the precaution that they might have HIV/AIDS.	89.0%
1.5. You are confident that the sterilization process in your practice is up to the standard.	65.9%
2. Statements evaluating attitudes towards patients with HIV:	
2.1. You would feel worried when treating patients with HIV.	67.0%
2.2. You will not feel uncomfortable if a patient tells you he or she has HIV/AIDS.	51.8%
2.3. If possible, you would deny giving treatment to patients with HIV.	20.4%
2.4. You would deny giving treatment to patients with HIV if the procedures involve bleeding.	13.0%
2.5. You might deny giving treatment to patients with HIV even though the procedures do not involve bleeding.	19.1%
2.6. If patients require extraction or surgical removal of impacted tooth, it is better to perform the operation in the hospital for the benefit of both patients and doctors.	68.2%
2.7. If not necessary, you would not want to treat patients with HIV.	50.0%
2.8. You admire patients who tell you they have HIV/AIDS.	96.6%
2.9. You would feel angry if a patient told you he/she had HIV/AIDS after the treatment.	41.9%

Table 6. Responses with "negative attitude" towards HIV, by percentage of agreement with each statement by group of dental practitioners

	Percentage of Agreement by Group				
Statement	Dental Students	General Dentists	Specialist Dentists	Dental Hygienists	Dental Assistants
You would feel angry if a patient told you that he/she had HIV/AIDS after the treatment.	50.9%	42.3%	24.6%	43.4%	50.0%
You would feel worried when treating patients with HIV.	94.3%	67.7%	68.1%	55.9%	65.5%
If possible, you would deny giving treatment to patients with HIV.	32.1%	16.2%	20.3%	19.9%	20.7%
You would deny giving treatment to patients with HIV if the procedures involve bleeding.	18.9%	6.2%	8.7%	19.1%	13.8%
If not necessary, you would not want to treat patients with HIV.	60.4%	49.2%	47.8%	50.0%	44.8%

Note: Percentages may not total 100% because of rounding.

and held high moral and ethical values, they still did not have confidence that they would be treated as equally as patients who were HIV-negative. Once corrected, the reciprocal attitude between dental practitioners and patients with HIV would lead to better care for Thais with HIV, who deserve the basic human right to receive health care the same as anyone. An important step in the solution to this problem is to inform dental practitioners of current knowledge on HIV pathogenesis, treatment and prognosis, proper infection control of instruments, the practice of universal precautions, and the availability of occupational post-exposure prophylaxis. Moreover, ethical and legal considerations about treating patients with infectious diseases should be highlighted in the dental curriculum as well as in all hospitals and state-funded organizations to increase the number of dental practitioners with a positive attitude countrywide.

Conclusion

Our study found that a substantial group of Thai dental practitioners have good general knowledge about HIV transmission and early signs of AIDS. However, knowledge regarding HIV pathogenesis and current treatment protocols for patients with HIV is still lacking among them. Regarding attitude, we found that unwillingness to give treatment or nega-

tive attitude towards patients with HIV is observed among Thai dental practitioners in small but significant numbers. The findings in this study and others suggest that negative attitudes of dental practitioners towards patients with HIV can potentially affect the oral health of people living with HIV. A national campaign to improve knowledge and attitudes of dental practitioners towards HIV should be established.

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