

# An Investigation of Dentists Knowledge, Attitude and Practices towards HIV+ and Patients with other Blood Borne Viruses in Mosul City

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## المخالصة

**الهدف:** تهدف هذه الدراسة الى بيان العلم الموجود لدى مجموعة من اطباء الاسنان في العراق حول مرض الايدز وغيره من الامراض الفايروسية التي تنتقل عن طريق الدم ، والتوجه لعلاج مرضى الايدز والسلوك الوقائي المتبع، الطرائق المتبعة لتعقيم ادوات الاسنان، والتلقيح ضد مرض التهاب الكبد الفايروسي من نوع B. **المواد وطرائق العمل:** اشتملت عينة الدراسة على 210 طبيب أسنان ممن قاموا بملاء استمارات استبيان خاصة . **النتائج:** اظهرت النتائج ان اطباء الاسنان يمتلكون كمية ضئيلة نسبيا من المعلومات العامة والحالات المتعلقة بالايديز، التي من الممكن ان تشاهد بالفم وبمعدل يتراوح بين 4,21-7,33 ويفرق معنوي واحصائي للجنس والتخصص، ولقد كان ميل اطباء الاسنان لعلاج اسنان المرضى المصابين بالايديز قليل وبدون فرق معنوي بالنسبة للجنس والتخصص ، حيث ان 40 - 70 % من اطباء الاسنان رفضوا معالجة مريض الايدز، وكان اطباء الاسنان الاصغر عمرا والذين لديهم خبرة عمل اقل من (5) سنوات أكثر تقبلا لعلاج مرضى الايدز مقارنة بالطباء الذين لديهم سنوات خبرة أكثر بالعمل. اغلبية العينة 98,57 % استخدموا الحرارة الجافة لتعقيم الادوات ، ( 92,86 % ) من العينة كان لديهم خوف من ان وخزة الابرة المستخدمة في العمل من الممكن ان تسبب الايدز فقط ( 2,38% ) من العينة استخدموا الطرق الوقائية الثلاثة (الكمامة ، الكنوف، ونظارات العين) للوقاية من الامراض في عملهم . بينت الدراسة أيضا بأن طبيبات الأسنان (الأخصائيات والممارسات) قد أجرن التلقيح أكثر ضد مرض التهاب الكبد الفيروسي مقارنة بأطباء الأسنان الذكور ويفرق إحصائي ومعنوي . 97,14% من العينة شعروا بانهم يحتاجون الى معلومات اضافية حول مرض نقص المناعة المكتسب، بالاضافة الى غيره من الالتهابات الفايروسية والبروتوكولات المستخدمة لمنع الاصابة . **الاستنتاج:** نحتاج الى المزيد من الجهود التعليمية من الملاك التعليمي الموجه نحو طلاب طب الأسنان للتعرف على الامراض الفايروسية التي تنتقل عن طريق الدم، فضلا عن اعتبار الوقاية العامة والشاملة يجب أن تتبع من خلال سنوات الدراسة في العملية في الكلية، وتعزز بدورات تعليمية بعد التخرج، لإيصال احداث المعلومات لهؤلاء الخريجين، عن طرق الوقاية من الأمراض وكيفية معالجة المرضى المصابين بهذه الامراض بحيث يصبح استخدام الطرق الوقائية جزءا لا يتجزء من حياتهم العملية كأطباء اسنان . بسبب النقص الموجود في المعلومات وطرق الوقاية ضمن العينة، فيوصي بالتركيز في المنهج الجامعي على الاصابات الفايروسية التي تنتقل عن طريق الدم وكيفية انتقاله والوقاية منها

## Abstract

**Aims:** To investigate a group of Iraqi dentists knowledge about HIV infection and other blood borne viruses. Attitudes towards treating HIV/AIDS patients and behavior practices, methods used for sterilization of dental instruments and vaccination against hepatitis B virus. **Materials and Methods:** The study population consisted of 210 dentists. The survey instrument was a self-administered questionnaire. **Results:** General and knowledge of the oral and other conditions related to AIDS patient was relatively low with a mean ranging between 4.21-7.33, with significant difference in gender and specialty on knowledge .Dentists attitude towards treating HIV patient was low with no significant differences in gender and specialty as 40-70% refused to treat such patient. Younger dentists with service of 5 years were more willing to treat HIV patients compared with those who had more service years. Majority of the sample (89.57%) used dry heat for sterilization of dental instruments, 92.86% of the sample was afraid that a needle stick injury could cause HIV infection. Only 2.38% of the sample used the three proper barrier technique in their work .Female dentists (specialist and dental practitioners) tended to be vaccinated against hepatitis B with highly significant difference compared to males. 97.14% of the sample felt they needed more information about HIV and other blood borne viruses and infection control protocols. **Conclusions:** More effort of dental educators in teaching dental students about blood borne viruses and that universal precautions must be adopted through faculty policy and reinforced by continuing educational programs for dentists after graduation for refreshment and delivering latest updates about infection control protocols which should be adopted and reinforced at an early level of study .So that barrier techniques become a protocol and a norm in their daily practices as clinicians. Because of certain inadequacies in knowledge and infection control practices among respondents, a curriculum focusing on the management of blood borne viruses, including infection control is recommended.

**Key words:** Knowledge ,attitude, HIV, blood borne viruses.

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## INTRODUCTION

The incidence of human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) is rising in Iraq<sup>(1)</sup>. The Dentists and other healthcare personnel are at risk from occupationally acquired infections from close contact with blood and other body fluids of patients.<sup>(2)</sup> The Centers for Disease Control and Prevention<sup>(3)</sup> and other professional associations<sup>(4)</sup> „thus recommended adherence to infection control guidelines to decrease the risk of these and related occupationally acquired infections. The estimated risk of HIV transmission from general practice dentists to their patients is minimal if “universal precautions” are strictly observed.<sup>(2,5)</sup> Dental associations have issued recommendations that dentists are obliged to provide care for patients with infectious disease, including HIV infection.<sup>(6)</sup> However, previous studies<sup>(7-9)</sup> showed that one of the reasons that dentists have refused to treat patients with HIV infection was an inflated fear of cross infection caused by their lack of knowledge. It is decided to perform this study to assess the level of knowledge of the dentists about HIV and other blood borne viruses and their level of compliance with infection control recommendations in Mosul dental clinics and their knowledge and attitudes about the risks of HIV and other blood borne viruses transmission from infected patients.

## MATERIALS AND METHODS

According to personal contact, the estimated number of dentists in Mosul at the time of data collection was 600 dentists working in two major sectors including the facilities enrolled under the Ministry of Health and the Ministry of Higher Education and Scientific Research in the College of Dentistry, with a total of 425 general dental practitioner and 175 Dental special-

ists in different fields of Dentistry and other related oral science.

Two hundred and ten dentists ( 64 specialist and 146 general dental practitioners) (clinically active and in contact with patients ) were included in this survey .They were divided according to the years of service as a dentists as those with equal to or less than 5 years , between 6- 10, 11- 15 and equal to or more than 16 years . The dentists were asked to fill up a self administered questionnaire, general knowledge was tested with 5 questions regarding type of virus , modes of transmission , prevalence of HIV, could handpiece transmit the virus, and about why there is no vaccine to the virus( each question scored 2 points and the dentists general knowledge was analyzed as the sum of correct answers of each statement with a total of 10 scores). Knowledge of the conditions related to an AIDS patient was tested by including 10 of the most clinically and orally related conditions including aphthous, hairy leukoplakia, Kaposi sarcoma, candidial infections, erythematous candidiasis, melanin hyper pigmentation, purpura, herpes, lymphoma and angular cheilitis , each condition scored 1 point and the data was analyzed after the sum of each correct answer was determined ( total score 10 points).

Attitudes of the dentists was assessed by asking them who was willing to treat HIV patient , and their choice if they had to mandatory choose between treating HIV or HBV and HCV (hepatitis B and C patient ) .Their fear from needle stick injury and fear from having the disease transmitted to them through their work as dentists.

Behavioral practices were measured on whether they took necessary precautions when treating any patient and the use of barrier technique. The methods used by the dentists to sterilize instruments and if they had been vaccinated against hepatitis B virus. Finally, the dentists, perception on

their knowledge HIV/AIDS and other blood borne viral infection were determined.

The analysis of the data was performed using descriptive statistics including mean, standard deviation and percentages, ANOVA. Duncan's multiple range test and Chi square test, results were significant when  $P \leq 0.05$ .

### RESULTS AND DISCUSSION

This is the first survey, to our knowledge, describing the knowledge, attitude and behavior of Iraqi dentists concerning HIV and other blood borne viruses and

infection control protocols. It is believed that these results can be generalized to dental practitioners in the wider Iraqi community. Although a previous survey on dental students revealed limited knowledge on AIDs<sup>(10)</sup>. Distribution of the sample by gender, years of service and specialization is shown in Table (1). The sample was composed of 210 dentists (146 general dental practitioners and 64 specialists ) 144 males and 66 female dentists. The majority of the sample had practiced dentistry and were in contact with patients for a period of equal to or less than 5 years (89 dentists) .

Table (1) :Distribution of the sample by gender, years of service and specialization.

Gender	Male				Female				Total			
	GDP		Specialist		GDP		Specialist		GDP		Specialist	
Years of Service	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
≤5	58	56.86	6	14.29	22	50.00	3	13.64	80	54.8	9	14.1
6-10	25	24.51	19	45.24	16	36.36	13	59.10	41	28.1	32	50.0
11-15	13	12.75	8	19.05	5	11.37	3	13.63	18	12.3	11	17.1
≥16	6	5.88	9	21.42	1	2.27	3	13.63	7	4.8	12	18.8
Total	102	100	42	100	44	100	22	100	146	100	64	100

Tables(2) and (3) display the general and dental knowledge of the dentists which was relatively low ranging between 4.21-7.33. There was statistically significant gender difference as female dentists had more knowledge and were able to detect oral lesions associated with HIV except for dentists whose service was between 6-10years(oral knowledge) and dentists who had service of more than 16 years (general knowledge) .There was no gender difference in knowledge between males and females , and this contradicts

another study <sup>(11)</sup> that found males had more knowledge than the female respondents. No significant difference was observed with level of knowledge and number of years of service as a dentist .This is in agreement with another study that found no difference in the number of year in service and knowledge,<sup>(9)</sup> our study also pointed that specialist tended to have more information and knowledge compared with general dental practitioner, this is in agreement with other studies <sup>(9,12)</sup>.

Table (2): ANOVA and Duncans multiple range test for General Knowledge according to gender, Specialization and years of service.

Gender	General knowledge (mean)					
	Male			Female		
Service	GDP	Spec	Total	GDP	Spec.	Total
≤5	5.48A	6.73B	6.12(A)	6.67A	7.33B	7.02(B)
6-10	5.64A	6.70B	6.07(A)	6.53A	7.08B	6.87(B)
11-15	5.54A	6.0A	5.83(A)	6.13A	6.67B	6.54(B)
≥16	4.55A	5.09B	5.01(B)	5.33A	6.00A	5.78(B)
p-value	0.87(NS)	0.55(NS)	0.35(NS)	0.43(NS)	0.33(NS)	0.28(NS)

NS = Not significant ( $p > 0.05$ ) ANOVA test , according to years of service Capital letters compare between GDP and Spec in the same no. of service years Means with same letters vertically are not significant at  $p \leq 0.05$ ; Capital letters between brackets compare between total males and females with in the same no..of service years

Table( 3): ANOVA and Duncans multiple range test Oral knowledge according to gender, Specialization and years of service.

Gender	Oral (mean) Knowledge					
	Male			Female		
Service	GDP	Spec.	Total	GDP	Spec.	Total
≤5	4.65A	6.00B	5.78(A)	4.50A	6.67B	6.43(B)
6-10	4.21A	5.46B	5.04(A)	4.53A	6.77B	5.78(A)
11-15	4.38A	5.89B	4.85(B)	4.38A	5.40A	5.25(B)
≥16	4.67A	5.33B	4.89(AB)	4.67A	5.33B	5.19(B)
<b>Total</b>	0.89(NS)	0.09(NS)	0.22(NS)	0.57(NS)	0.88(NS)	0.42(NS)

NS = Not significant ( $p > 0.05$ ) ANOVA test , according to years of service Capital letters compare between GDP and Spec in the same no. of service years Means with same letters vertically are not significant at  $p \leq 0.05$ ; Capital letters between brackets compare between total males and females with in the same no..of service years

It can be observed in table (4) that there was no significant difference in gender and specialty in dentists that were willing to treat HIV patient than those who did not as between (80.39- 84.37)% of the sample refused to treat such patient .Table (5) displays that younger dentists with service of 5 years were more willing to treat HIV

patients compared with those that had more service years. This might be attributed to the reason that younger dentists may have received more formal training and educational programmes related to HIV and other blood borne virus in their dental studies than older dentists.

Table (4) Distribution of dentists who were willing to treat HIV patients according to gender and specialty.

Rx Gender	GDP				Specialist			
	No.	Yes %	No.	No %	No.	Yes %	No.	No %
Male	20	19.61	82	80.39	6	14.29	36	85.71
Female	8	18.18	36	81.82	4	18.18	18	81.82
Total	28	19.18	118	80.82	10	15.63	54	84.37
p-value	0.949(NS)				0.726(NS)			

NS = Not significant using Chi-square test

Table (5) Distribution of dentists who were willing or refused to treat HIV patients according to years of service and specialty.

Gender	Male				Female							
	GDP		Spec		Total		GDP		Spec.		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
≤5	15	25.86	3	.50	18A	28.13	5	22.7	2	66.66	7A	28.00
6-10	2	0.8	1	5.26	3A	6.81	2	12.5	2	15.38	4A	13.79
11-15	2	15.38	1	12.5	3A	14.29	1	20	0	0.00	1A	12.50
≥16	1	16.66	0	0.00	1A	6.66	0	0.00	0	0.00	0A	0.00
p-value	0.04(S)		0.05(S)		0.02(S)		0.033(S)		0.033(S)		0.04(S)	

S = Significant ( $p > 0.05$ ) ANOVA test, according to years of service; Capital letters compare between total males and females with in the same number of service years

Figure (1) shows the methods used by dentists in sterilizing dental instruments, 89.57% of the sample used dry heat. Dry heat is less effective than steam autoclaving and it requires higher temperatures and a longer exposure time. For example, the recommended exposure time for dry heat sterilization is 1-4 hours at a temperature of 160 ° C, compared to 30 minutes at 121° C in an autoclave, 1.43% of sample used boiling water for sterilization which is much less than that reported in another study in India 61%,<sup>(13)</sup>. The use of boiling water as a method of sterilization is no longer accepted nor effective. In a study

Staphylococcus aureus bacterial growth was isolated from instruments sterilized by boiling-water device.<sup>(14)</sup> This suggests that boiling water is not an effective method of sterilization. It does not even disinfect and should be rejected as a method of sterilization. In a study in Mosul on handpiece sterilization<sup>(15)</sup>, sterilization was found to be poor because majority of the respondents did not have an autoclavable handpiece, nor autoclaves and majority used disinfectant such as chlorhexidine, alcohol, septicin, dettol and sodium hypochlorite for disinfection only.

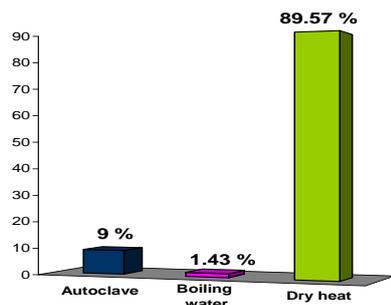


Figure (1) Methods of sterilization used by the dentist.

Every health care specialty that involves contact with mucosa, blood or blood-contaminated body fluids must be regulated. The goal is to ensure compliance with universal barriers and other methods to minimize, infection risks. There are many routes by which contamination in dental surgery can be transmitted from patients to dental health care workers and vice-versa. Documented cases of transmission of hepatitis B, HIV and other infectious disease have been reported in literature. <sup>(16,17)</sup> Although there is no evidence that pathogens, including HIV, have been transmitted via the dental handpiece. The potential for cross-infection has been demonstrated, routine heat sterilization of handpieces between patients is therefore recommended. <sup>(18)</sup>

Figure (2) displays that 92.86% of the sample was afraid that a needle stick injury could cause HIV infection. Pros-

pective studies estimate the average risk for HIV infection after percutaneous and mucous membrane (eyes, nose, mouth) exposure to HIV-infected blood is approximately 0.3% and 0.09%, respectively. <sup>(19)</sup> The transmission of HIV infection after noncontact skin exposure has been documented. <sup>(20)</sup> The average risk of transmission by this route has not been quantified, but it is estimated to be less than the risk following mucous membrane exposure. <sup>(21)</sup> Similarly, the risk of transmission after exposure to fluids or tissues other than HIV-infected blood is probably considerably lower than the risk following exposure to blood. <sup>(19,22)</sup> In 2002, occupational exposure to HIV was confirmed in 57 health care personnel, and of these none were oral healthcare personnel oral health care practitioner <sup>(23,24)</sup>, Never the less a certain protocol after sharp and needle stick injury must be followed. <sup>(17,24)</sup>

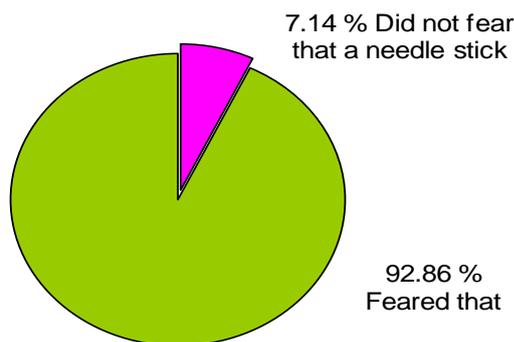


Figure (2) Fear of contracting AIDS or other blood borne virus by needle stick

Table (6 ) displays that 174 of total sample of dentists preferred to treat a person infected with HBV or HBC compared to HIV was much higher with a statistically significant difference regarding both gender and specialty. Many dentists are much more willing to treat patients with infectious B or C virus, but according to a study the annual cumulative risk of infection from routine treatments in patients whose seropositivity is undisclosed is 57 times greater for HBV than from HIV and the risk of dying from HBV infection is 1.7 times greater than the risk of HIV in-

fection , for which the mortality is almost certain.<sup>(25)</sup>, while Hepatitis C is a significant, global public health concern because of the large and increasing number of infected people and the associated morbidity, such as chronic liver disease and mortality. Currently, an estimated 170 million people or 3% of the world's population have hepatitis C,<sup>(26)</sup> the increasing global prevalence puts extra demands on health services and increases the likelihood that health professionals will care for or have personal contact with people with hepatitis C.

Table (6) Mandatory Rxing one of two patients infected with HIV or HBV and HBC according to gender and specialty.

Gender	Mandatory	HIV		HBV		p-value
		No.	%	No.	%	
Male	GDP	24	82.8	81	68.6	0.02 (S)
	Spec.	5	17.2	37	31.4	
	Total	29	100	118	100	
Female	GDP	5	71.4	36	64.3	0.04(S)
	Spec.	2	28.6	20	35.7	
	Total	7	100	56	100	

S = Significant using Chi-square test

It can be demonstrated in Figure (3) that only 2.38% of the sample used the three proper barrier technique in their work (mask ,gloves and eye glasses ), this figure is very much less than that reported

in many developed countries<sup>(18,27)</sup>, as eye glasses were not much used in this study, this figure is similar to that of other studies in developing countries.<sup>(11,13)</sup>

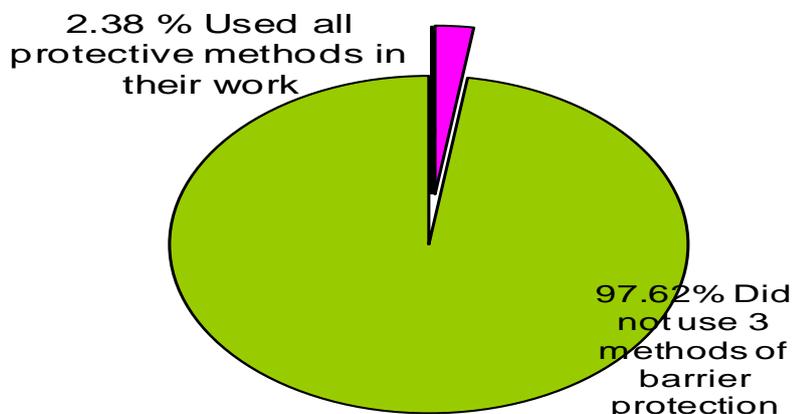


Figure (3) Use of barrier technique in work

Masks should be changed throughout the operating day ,as it has been found as a source of contamination because it becomes impregnated with microorganisms after 20 minutes of use. The same mask is sometimes worn by a dentist working at the chair for a half or full day. It is reasonable to conclude that a dentist who wears a mask for such a long period of time when operating is more at risk from cross infection than a dentist who operates unmasked .The same observation is true for gloves.<sup>(28)</sup> In another study<sup>(29)</sup> Compliance with universally recommended infection control procedures was high as 57% of respondents changed gloves when they leave the patient; 70% change gloves when they use the phone; 23% use gloves while reviewing the records. Transmission of infection within a dental surgery may occur by di-

rect contact of tissue with secretions or blood, from droplets containing infectious agent, or via contaminated sharps or instruments which have been improperly sterilized. The major route of cross infection in dental surgery is via infection through intact skin or mucosa due to accidents involving sharps, or direct inoculation onto cuts and abrasions in the skin.<sup>(30)</sup>

Table (7 )demonstrates the number and percentages of dentists that have been vaccinated against viral hepatitis B, female dentists (specialist and dental practitioners) tended to be vaccinated with highly significant difference compared to males dentists 92.42%, in general the results of dentist being immunized were much lower than that reported in other countries<sup>(18,31,32)</sup> and of dental students<sup>(33)</sup>.

Table (7) Vaccination against hepatitis B according to gender and speciality.

Gender	Specialty	Vaccination B				p-value
		Yes No.	Yes %	No No.	No %	
Male	GDP	73	50.7	30	20.84	0.0460(S)
	Spec.	32	22.2	9	6.26	
	Total	105	72.9	39	27.1	
Female	GDP	42	63.64	1	1.51	0.376(NS)
	Spec.	19	28.79	4	6.06	
	Total	61	92.42	5	7.58	

NS = Not significant using Chi-square test

It can be demonstrated in Figure (4) that majority of the sample 97.14% felt they needed more information about HIV and other blood borne viruses and infection control protocol, this may indeed be the cause of non-compliance with apprehension about occupational risk experienced by many dentists: There key reasons for noncompliance being poor practice. It is not possible to know which patients may carry a blood borne virus, and so the only safe work practice is they lack knowledge regarding the rationale for and effectiveness of safety practices or the transmission mechanisms for blood borne

viruses. It is the task of dental educators from early stages to teach dental students that universal precautions must be adopted through faculty policy and reinforced by continuing educational programs for dentists after graduation for refreshment and delivering latest updates about infection control protocol. Age and population-based differences need to be considered in planning educational programs in the care, a Canadian study found that although dentists over sixty years old had the highest compliance with hand washing, they were the least compliant with other infection control procedures such as the sterili-

zation of handpieces, the use of rubber dams, and HBV immunization.<sup>(19)</sup>

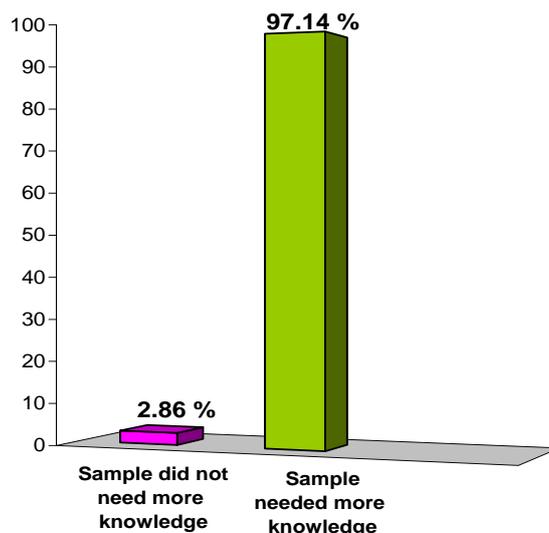


Figure (4) Knowledge about blood borne viruses.

Some of the resources available to support organizational and curricular changes are available or adaptable from the CDC ([cdc.gov](http://cdc.gov)), the American Dental Association ([ada.org](http://ada.org)), the FDI World Dental Federation ([fdiworldental.org](http://fdiworldental.org)), and the Organization for Safety and Asepsis Procedures ([osap.org](http://osap.org)), a not-for-profit organization specialized in infection control in dentistry and a FDI's Supporting Member. International networks and research collaborations could be ideal vehicles to identify challenges and opportunities in dental education while ensuring that IC programmes are tailored to respond realistically to local and regional priorities, with the resources available. Regulatory authorities, academia, industry and organized dentistry can contribute to achieving a safer dental environment where oral health care workers and their patients are protected.

### CONCLUSIONS

Safety practice is an important element of workplace safety and quality of health care. The results show insufficient knowledge of surveyed dentists with regard to the protection and infection control upon HIV infection and other blood borne infections. Many of the respondents in this study would not operate on HIV positive patients.

This aversion may be related to the perception of risk of infection, the non-

availability of equipment to comply with universal precautions, inadequate training. The risk of HIV transmission in the oral healthcare setting is low. However, the emotional impact of a needle stick injury can be substantial. The only safe approach is to assume that any patient is a carrier of a blood-borne virus.

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