International Journal of Innovative Research in Medical Science (IJIRMS)
Volume 02 Issue 08 August 2017, ISSN No. - 2455-8737
Available online at - www.ijirms.in

Open Access Journal | Research Article | DOI: 10.23958/ijirms/vol02-i08/01

Awareness and Practice of Infection Control among Selected Sample of Dental Students in Saudi Arabia

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Abstract:

Cross infection control is an infectious agent transmitted within the clinical environment between patients and staff, Dental education and proper training of dental student is the major role to protect patients and dental students, to create a safe environment by facilitate immunization and help dental students to have good knowledge and attitudes toward the infection control.

Objective: *to Analyze and evaluate the knowledge, attitudes and practice toward infection control and infectious diseases among dental students in Saudi Arabia.*

Material and methods: *It is a cross sectional study conducted on senior undergraduate dental students among different dental school in Saudi Arabia.*

An online survey was developed using surveymonkey.com. Consist of 20 questions related to hepatitis B vaccination and serology, the use of personal protective equipment, infection control practices and awareness, percutaneous and mucous membrane exposure, and attitudes toward the dental treatment of infected patients. Data was performed using SPSS version 20.

Result: *A total of 329 students participated in this study, the majority of students were highly aware about the meaning of infection 98.2%, infection control protocol 96.7%, and that infection can be transmitted by blood 98.5%, saliva 97.3%, and equipment 93.6%. Majority of respondent reported that AIDS and hepatitis can be spread in the clinic during treatment.*

With regards to vaccination, 87.5% had been vaccinated against hepatitis before entering the clinic.

Although 65.3% of the students reported that they receiving enough training of infection control protocol in their college, only 51.7% were aware about the management protocol of dealing with AIDS patients.

Conclusion: *Although the awareness of dental students toward the infection control protocol were high, but the awareness about the management protocol of dealing with AIDS patients were low. Dental School should provide more courses and training about the policy of infection control.*

Keywords: ***Awareness, dental students, infection control.***

Introduction

Cross infection control is an infectious agent transmitted within the clinical environment between patients and staff.[1]It is well known that Infectious disease is a major public health problem in many countries.[2] Infection agent can be transmitted through several routes-direct (blood, saliva and water from dental unites)[3,4,5] -indirect (contaminated instruments , operative equipment and environmental surfaces).[6,7]

Patients intend to dental clinic can be classified as Healthy , carriers or suffering from infectious diseases, the most difficult one to recognize is the carrier.[8] In dentistry many dentist may face different types of blood borne pathogens found in oral cavity or respiratory tract .Examples of these organisms are hepatitis B virus (HPV) ,hepatitis C virus (HCV), herpes simplex virus (HSV type 1 and 2), human immunodeficiency virus HIV/AIDS , mycobacterium tuberculosis, staphylococcus , streptococcus and other viruses and bacteria.[9]

DOI: 10.23958/ijirms/vol02-i08/01

Dental education and proper training of dental student is the major role to protect patients and dental students ,to create a safe environment by facilitate immunization and help dental students to have good knowledge and attitudes toward the infection control.[10,11]

The hand considered to be the most infectious part of the body,[12] because the blood can be trapped within the finger-nail up to 5 days[13]

It has been reported that it is possible to prevent the transmission of infection in the three routes (patient to dentist - dentist to patients and from one patients to another .and according to many studies, the greatest way of transmission is between patient and dentist) and it can be prevented by using precautions, infection control guide lines, vaccination and proper post exposure management.[11,14]

There are several factors to limit the spread of infections by use of barriers techniques such as wearing gloves , masks , protective clothes (Gown),eye glasses ,face shield, rubber dam, disinfect impression and prosthesis ,disposable caps and hair protections.[15] Students are not allowed to wear jewelry in clinic and must have short fingernail.[16]

Before enter the clinical year, the students must take the HB vaccination.[16]

There is various studies talking about the infection control and the attitude of the Dental students in some region of Saudi Arabia and other countries,[10,15,16,17,1]

The aim of the study:

Is to Analyze and evaluate the knowledge, attitudes and practice toward infection control and infectious diseases among dental students in Saudi Arabia.

Material and Methods

It is a cross sectional study, it was conducted on senior undergraduate dental students among different dental school in Saudi Arabia.

An online survey was developed using surveymonkey.com.

The questionnaire was consist of 29 questions related to hepatitis B vaccination and serology, the use of personal protective equipment, infection control practices and awareness, percutaneous and mucous membrane exposure, and attitudes toward the dental treatment of infected patients.

Statistical analysis:

Data analyses was performed using SPSS version 20.

Frequency measurement has been calculated, Chi-square, and Fisher exact tests was performed, and ANOVA test has been use to compare among the groups. A p -value <0.05 will be considered significant.

Result

Of the 329 dental students, the majority were aged between 21-25 years (n=304, 92.4%). Fifty three (16.1%) were males and 276 (98.9%) were females with a male-female ratio of 1:5.2. One hundred fifty seven (47.7%) were in 6th year followed by 91 (27.2%) in 4th year and 81 (24.6%) in 5th year (Table 1).

Table 1: Demographics

		Frequency (n)	Percent (%)
Age	*≤20 years*	7	2.1
	21-25 years	304	92.4
	26-30 years	18	5.5
Gender	*Male*	53	16.1
	Female	276	83.9
Educational year	*4th year*	91	27.2
	5th year	81	24.6
	6th year	157	47.7

Table 2: Students' knowledge, attitudes, and practice of infection control measures

		n (%)
Are you aware about the meaning of infection?	*Yes*	323 (98.2)
	No	6 (1.8)
Are you aware about the infection control protocol?	*Yes*	318 (96.7)
	No	11 (3.3)
Are you aware that infection can be transmitted by blood?	*Yes*	324 (98.5)
	No	5 (1.5)

DOI: 10.23958/ijirms/vol02-i08/01

Are you aware that infection can be transmitted by saliva?	*Yes*	320 (97.3)
	No	9 (2.7)
Are you aware that infection can be transmitted by equipment?	*Yes*	308 (93.6)
	No	21 (6.4)
Do you think AIDS can be spread in the clinic during treatment?	*Yes*	239 (72.6)
	No	90 (27.4)
Do you think hepatitis can be spread in the clinic during treatment?	*Yes*	308 (93.6)
	No	21 (6.4)
Have you been received vaccine for hepatitis before entering the clinic?	*Yes*	288 (87.5)
	No	41 (12.4)
What type of hepatitis needs vaccination?	*Hepatitis A*	11 (3.3)
	Hepatitis B	260 (79.0)
	Hepatitis C	4 (1.2)
What is the most common type of hepatitis in Kingdom of Saudi Arabia?	*Hepatitis A*	35 (10.6)
	Hepatitis B	214 (65.0)
	Hepatitis C	79 (24.0)
	Hepatitis D	1 (0.3)
Are you aware about needle stick injury protocol?	*Yes*	283 (86.0)
	No	46 (14.0)
Do you treat patients with infectious diseases?	*Yes*	108 (32.8)
	No	221 (67.2)
Do you know the proper dental management of patient with infectious diseases?	*Yes*	241 (73.3)
	No	88 (26.8)
Are you aware about long finger-nails can be a source of infection?	*Yes*	272 (82.7)
	No	57 (17.3)
Are you aware about the management protocol of dealing with AIDS patients?	*Yes*	170 (51.7)
	No	159 (48.3)
Did you receive enough training of infection control protocol in your college?	*Yes*	215 (65.3)
	No	114 (34.6)
What is the best method for instrument sterilization?	*Autoclave*	309 (93.9)
	Disinfectant spray	9 (2.7)
	Both same effect	3 (0.9)
	Don't know	8 (2.4)
Do you change gloves between patients?	*Yes*	328 (99.7)
	No	1 (0.3)
Do you wash your hands between patients?	*Yes*	305 (92.7)
	No	24 (7.3)
Do you leave your clinic while you are wearing gloves?	*Yes*	33 (10.0)
	No	296 (89.9)
Are you touching the equipment inside or going outside when wearing gloves?	*Yes*	56 (17.0)
	No	273 (82.9)
Do you cover your hair during treatment?	*Yes*	300 (91.2)
	No	29 (8.8)
Do you wear protective gowns?	*Yes*	320 (97.3)
	No	9 (2.7)
Do you use facial shield and facial mask?	*Yes*	313 (95.1)
	No	16 (4.8)
Do you disinfect the impression & prosthesis before sending it to the lab?	*Yes*	306 (93.0)
	No	23 (6.9)

Table 3 shows students' knowledge, attitudes, and practice of infection control measures. The vast majority of students reported being aware about the meaning of infection (n=323, 98.2%), about infection control protocol (n=318, 96.7%), and that infection can be transmitted by blood (n=324, 98.5%), saliva (n=320, 97.3%), and equipment (n=308,

DOI: 10.23958/ijirms/vol02-i08/01

93.6%). The majority think AIDS (n=239, 72.6%) and hepatitis (n=308, 93.6%) can be spread in the clinic during treatment. With regards to vaccination, 87.5% (n=288) reported receiving vaccine for hepatitis before entering the clinic, 79% (n=260) reported hepatitis B needs vaccination, and (65%, n=214) reported hepatitis B as the most common type of hepatitis in Kingdom of Saudi Arabia.

Although 73.3% (n=241) knew the proper dental management of patient with infectious diseases, but only 32.8% (n=108) reported treating patients with infectious diseases. The majority of students were aware about needle stick injury protocol (86%, n=283) and that long finger-nails can be a source of infection (82.7%, n=272). Although 65.3% (n=215) of the students reported receiving enough training of infection control protocol in their college, only 51.7% (n=170) were aware about the management protocol of dealing with AIDS patients.

With regard to students' self-reported use of protective barrier techniques, the majority reported autoclave as best method for instrument sterilization (93.9%, n=309). Almost everyone (99.7%, n=328) reported changing gloves between patients, 92.7% (n=305) washed their hands between patients, 89.9% (n=296) did not leave clinic while they are wearing gloves, 82.9% (n=273) did not touch the equipment inside or go outside while they are wearing gloves, 91.2% (n=300) covered their hair during treatment, 97.3% (n=320) wear protective gowns, 95.1% (n=313) used facial shield and facial mask, and 93% (n=306) disinfected the impression & prosthesis before sending it to the lab.

Two-way cross-tabulation showed 21-25 years old, females, and fourth year dental students were more likely to have the knowledge, attitudes, and practice toward infection control and infectious diseases. Pearson Chi-square test showed no statistical significant association between age and knowledge, attitudes, and practice toward infection control and infectious diseases ($p>0.05$). Table 4 shows the statistical significant association between gender and knowledge, attitudes, and practice questions toward infection control and infectious diseases ($p<0.05$) and table 5 shows the statistical significant association between educational year and knowledge, attitudes and practice questions toward infection control and infectious diseases ($p<0.05$).

Table 4: Association between gender and knowledge, attitudes and practice toward infection control and infectious diseases

		Yes, n (%)	No, n (%)	p value
Have you been received vaccine for hepatitis before entering the clinic?	*Male*	40 (75.5)	13 (24.5)	0.010*
	Female	248 (89.9)	28 (10.1)	
Do you treat patients with infectious diseases?	*Male*	31 (58.5)	22 (41.5)	0.000*
	Female	77 (27.9)	199 (72.1)	
Did you receive enough training of infection control protocol in your college?	*Male*	42 (79.2)	11 (20.8)	0.027*
	Female	173 (62.7)	103 (37.3)	
Do you wash your hands between patients?	*Male*	45 (84.9)	8 (15.1)	0.037*
	Female	260 (94.2)	16 (5.8)	
Do you cover your hair during treatment	*Male*	35 (66.0)	18 (34.0)	0.000*
	Female	265 (96.0)	11 (4.0)	
Do you wear protective gowns?	*Male*	49 (92.5)	4 (7.5)	0.041*
	Female	271 (98.2)	5 (1.8)	

** p<0.05*

Table 5: Association between educational year and knowledge, attitudes and practice toward infection control and infectious diseases

		Yes, n (%)	No, n (%)	p value
Do you think AIDS can be spread in the clinic during treatment?	*4^{th} year*	77 (84.6)	14 (15.4)	0.005*
	5^{th} year	51 (63.0)	30 (37.0)	
	6^{th} year	111 (70.7)	46 (29.3)	
Have you been received vaccine for hepatitis before entering the clinic?	*4^{th} year*	72 (79.1)	19 (20.9)	0.006*
	5^{th} year	70 (86.4)	11 (13.6)	
	6^{th} year	146 (93.0)	11 (7.0)	
Did you receive enough training of infection control protocol in your college?	*4^{th} year*	69 (75.8)	22 (24.2)	0.003*
	5^{th} year	58 (71.6)	23 928.4)	
	6^{th} year	88 (56.1)	69 (43.9)	

** p<0.05*

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Discussion

Dental health professionals are at high risk of infection by blood-borne pathogens, as they are continually exposed to blood and saliva mixed with blood, and may even suffer needle punctures. Bacteria and diseases can be transmitted within dental clinical environment if the dental student didn't have enough knowledge, training and education.[1,10,11] The spread of infection can be limited by barrier technique and pre clinic vaccination.[15,16] The aim of this study is to evaluate infection control policy and awareness among undergraduate dental student in Saudi Arabia.

The majority of students reported high awarness about the meaning of infection (98.2%), and infection control protocol (96.7%) which is higher than previous reported studies comparing with other studies it is higher than previously reported study among Indian students.[19]

In this study The majority think AIDS (72.6%) and hepatitis (93.6%) can be spread in the clinic during treatment, which is higher compering with other study whom (60.1%) agreed that AIDS can spread in dental clinic during treatment of affected person and 30% knows about the hepatitis B spread in dental clinic.[9]

With regards to vaccination in this study, higher number 87.5% reported that they received vaccine against hepatitis before entering the clinic comparing with other studies who reported less number, Santhosh et al[20] (75.2%) ,Halboubb,et al.[17] (71.7%) ,Rosaiah,et al.[21] (84.5%), Noura, et al.[22] (61.4%), Ahmad el at.[23] (80%) And in agreement with de Souza RA, et al.[11] (90.8%), Al Maweri SA,et al.[24] (90%),Mauro ,et al.[25] (95.4).

In the present study 73.3% knew the proper dental management of patient with infectious diseases, but only 32.8% (n=108) reported treating patients with infectious diseases, in Al Maweri SA, et al.[24] they reported 15% treating patients with infectious diseases while willing to treat them 55,7% ,In de Souza RA,et al.[11] 87.8% reported no objection to treating patients with infectious diseases, in Betul, et al.[16] 66% didn't mind treating patients with infectious disease and in Noura, et al.[22] (66.7%) of the students showed positive attitude toward the treatment of patients with infectious diseases.

The majority of students were aware about needle stick injury protocol (86%), in Noura, et al.[22] injury with needles and burs was reported (21%) ,in Ahmad el at.[23] (91%) Store sharps in special containers, in Halboubb, et al.[17] (62.8%) reported non- sterile occupational percutaneous and Mucous injuries and in Santhosh,et al.[20] (97%) Use of special container for disposal of sharp objects.

The majority of students disinfect the impression and prosthesis before sending it to the lab (93.0%) in Santhosh,et al.[20] (27%) and in Ahmad el at.[23] (87%) Disinfect impression and (74%) Disinfect prosthesis.

The hand considered to be the most infectious part of the body,[12] because the blood can be trapped within the finger-nail up to 5 days[13] in this present study (99.7%) of the students change gloves between patients comparing with other studies it is higher than previously reported study by Ahmad el at.[23] (90%), Halboubb, et al.[17] (96.5%), Al Maweri SA, et al.[24] (99.6%), in Santhosh, et al.[20] (99.3%).

Conclusion

Although the awareness of dental students toward the infection control protocol were high, but the awareness about the management protocol of dealing with AIDS patients were low. Dental School should provide more courses and training about the policy of infection control

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