KNOWLEDGE, ATTITUDE AND PRACTICE OF DENTAL STUDENTS AGAINST INFECTION CONTROL IN ALLIED HOSPITAL FAISALABAD

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ABSTRACT

Objective: To evaluate knowledge, attitudes and practices regarding infection control measures among dental students of Allied Hospital Faisalabad.

Study Design: A questionnaire based descriptive cross-sectional study.

Place and Duration of Study: The study was conducted in Dental Section of Allied Hospital Faisalabad, from Dec 2017 to Jan 2018.

Material and Methods: A questionnaire-based descriptive cross-sectional study was conducted among 178 (1st, 2nd, 3rd & 4th) dental students at Allied Hospital Faisalabad and convenience sampling technique was used. The self-administered questionnaire was comprised of 7 knowledge based, 11 attitudes based and 4 practice-based questions regarding knowledge about various infectious diseases, use of barrier techniques, vaccination status, post exposure prophylaxis, attitude towards infection control and practices related to it. First and second year students were asked about only knowledge and attitude-based questions while third and final year students were asked about all three aspects (knowledge, attitude and practice). Data was analyzed using SPSS version 20. Variables were determined using chi square test, A *p*-value <0.05 was considered significant.

Results: The response rate was 100% (all students were potential respondents). Results of the study revealed that 55.1%, 40.4% and 4.5% of the participants obtained poor, fair and satisfactory level of knowledge about infections and infection control in dentistry respectively. Most of the students showed positive attitude towards infection control measures. Overall, 97.8% of the students (3rd & 4th year) had been vaccinated for hepatitis B virus (non-significant difference, *p*=0.96) and only 56.2% were tested for post hepatitis B virus serology (non-significant difference *p*=0.94) while the vast majority 97.8% reported always wearing gloves, 71.9% wearing face mask, 58.4% wearing eye shield, 58.4% wearing head cap and 68.5% wearing gowns for all dental procedures with no significant difference between year of study. A significantly higher percentage of final year students (93.4%) showed positive attitudes towards the treatment of patients with infectious diseases as compared to only 81.3% of 3rd year, 71.7% of 2nd year and 62.7% of 1st years students (*p*=0.02). A great number of students reported non-sterile occupational percutaneous and mucous injuries while treating their patients.

Conclusion: Our participants, had good attitude towards infection control in dentistry however they do not have satisfactory knowledge regarding infection control measures and their clinical practice also needs improvement. These findings highlight the necessity of continued infection control education among dental students of AHF.

Keywords: Attitude, Dental students, Infection control, Knowledge, Practice.

INTRODUCTION

Cross-infection can be defined as the transmission of infectious agents between patients and staff within a clinical environment[1]. Dental health personnel are at higher risk of exposure to cross infection with blood borne pathogens such as hepatitis B Virus (HBV), hepatitis C virus (HCV), human immuno-deficiency virus (HIV), cytomegalo virus (CMV), herpes simplex virus (HSV), tuberculosis (TB), streptococci, staphylococci and other viruses and bacteria that colonize the oral cavity and upper respiratory tract[2,3]. In addition we are living in an epoch where there is forthcoming of many communicable diseases[4,5]. Emerging agents as Ebola, Middle East Respiratory Syndrome-Corona virus (MERS-CoV), H1N1, H5N1 and others[6] can also be transmitted during dental

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procedures. In clinical environment, diseases can be transmitted through direct contact with blood, oral fluids or indirect contact with contaminated instruments, surgical tools or contact with aerosols of infected persons[7-9]. Persons who come for dental treatment, unknowingly could be carriers of certain infectious diseases. Furthermore, some infectious diseases have prolonged incubation periods (window period) during which antibodies can't be detected[10,11]. Taking medical histories without screening for HBV, HCV etc. increases the possibility to treat infected patients as non-infected which results in increased risk of cross infection[2]. By executing infection control principles annex to vaccination and proper post exposure prophylaxis, vulnerability to infections in dental clinics can be averted. The guidelines for infection control in dental health care of the U.S Center for disease control and prevention recommended careful handling of sharp instrument, use of rubber dams to minimize blood spattering, hand washing and use of protective barriers (e.g. gloves, masks, protective eye wears and gowns)[12,13]. Few dentists, however, follow these guidelines[14].

While dental students have less knowledge and experience as compared to dentists, the execution of standard universal precautions in dental schools is the most productive way to control cross infection[12,15]. Dental education is the main key in helping dentists to acquire adequate knowledge and attitude pertaining to infection control procedures[3].

It is the responsibility of dental colleges to implement felicitous infection control schemes and apt immunization to substantiate a sound environment for dental students and patients. The findings of this study accentuate the need of educating dental students about infection control measures and recent apposite guidelines. This study was done to determine infection control measures used by students and to find ways to reduce cross contamination in hospitals.

MATERIAL AND METHODS

This questionnaire based descriptive cross-sectional study was conducted on dental students of Allied Hospital Faisalabad (AHF) during 15th December 2017 to 15th January 2018. Approval for this study was taken from Medical Superintendent of Allied Hospital Faisalabad. Students of all professionals (1st, 2nd, 3rd, 4th/ final year) participated in the study as dental education is for 4 years in Pakistan and non-probability convenience sampling technique was used. First and second year students are not involved in clinical training thus only knowledge and attitude-based questions were asked from them while third and final year students were asked about all knowledge, attitude and practice-based questions. A total of 178 students (1st year, n=43; 2nd year, n=46; 3rd year, n=43; 4th year, n=46) participated in the study consisting of 42 male students and 136 female students. The self-administered English language questionnaire was comprised of 7 knowledge-based (e.g. infectious diseases that can be transmitted by dental practice, their modes of transmission, availability of vaccine, knowledge about standard infection control measures and post exposure prophylaxis etc.), 11 attitudes based (e.g. participants opinion regarding protective measures and cross infection during dental practice) and 4 practice-based questions (e.g. vaccination status, use of protective barriers, percutaneous injuries and preventive measure after exposure.) After taking verbal consent all the students in lecture hall were given

Table-I: Knowledge about dental infection and its control.

Score	1st Year (%) n:43	2nt Year (%) n:46	3rd Year (%) n:43	Final Year (%) n:46	Total (%) n:178	*p*-value
Poor (0-3)	43 (100)	34 (74)	15 (34.9)	6 (13)	98 (55.1)	<0.001*
Fair (5-6)	0 (0)	12 (26)	25 (58.1)	35 (76)	72 (40.4)	
Satisfactory(6-7)	0 (0)	0 (0)	3 (7)	5 (10.9)	8 (4.5)	

*Significant

questionnaire and asked to fill it without discussion in 20 min. Data was analyzed using SPSS version 20 and descriptive statistics like mean, standard deviation, frequency and percentage were calculated and chi-square test was used to assess associations between different variables. A *p*-value ≤0.05 was considered significant. For each knowledge question, a score of "1" was given for correct answer and "0" for incorrect or unknown answer. A total knowledge score was calculated and it ranged from 0-7. It was then classified into 3 categories

Poor Score: <50% of correct answer (<3/7 questions)

Fair Score: 50% - 2/3rd of correct answers (4-5/7 questions)

Satisfactory Score: >2/3rd of correct answers (6-7/7 questions).

RESULTS

The study sample comprised data from 178 students with male=42 (23.6%) and female=136 (76.4%), (male to female ratio 21:68) at Allied Hospital Faisalabad (response rate 100%) of which 1st year have 25.6% male and 74.4% female students and second year have 28.2% male and 71.7% female students and 3rd year have 30.2% male and 69.8% female students while final year have 10.9% male and 89.1% female students.

Regarding knowledge about infection control 55.1%, 40.4% and 4.5% students obtained poor, fair and satisfactory score respectively.

Table-II: Students' attitudes regarding infection control.

	1st year (%)			2nd year (%)			3rd year (%)			4th year (%)		
	A	DA	N	A	DA	N	A	DA	N	A	DA	N
Dentists should be vaccinated against HBV?	42	1	0	46	0	0	40	2	1	46	0	0
Dentists should change gloves between patients?	41	2	0	46	0	0	41	1	1	45	1	0
Dentists should wash hands between each gloves change?	41	0	2	45	1	0	41	0	2	45	0	1
Dentists should change lab coat/gown if visibly contaminated?	41	1	1	46	0	0	41	0	2	45	0	1
Dentists should always wear gloves, facemasks, head cap, eye goggles while treating patients?	41	1	1	46	0	0	39	1	3	46	0	0
Dentists should wash and disinfect instruments before sterilization?	40	1	2	40	2	4	41	1	1	46	0	0
Dentists should sterilize instruments after each dental practice?	41	1	1	45	0	1	41	0	2	46	0	0
Dentists should clean and disinfect the dental unit?	41	0	2	45	0	1	42	0	1	46	0	0
Dentists should laminate headrest, light holder and tray holder before stating any procedure?	42	0	1	44	1	1	42	1	0	45	1	0
Dentists need to give prophylactic antibiotics to some patients prior to some procedures?	25	5	13	36	2	8	37	2	4	44	1	1
Dentists should be willing to treat patients with infectious diseases?	27	5	11	33	5	8	35	2	6	43	0	3

*A=Agree, DA=Disagree, N=Neutral, **p*-value is significant only for last two statements which are respectively 0.002 and 0.026.

(table-I) with mean ± standard deviation as 1.49 ± 0.585.

Most of the students showed positive attitude toward infection control measures, (table-II). Attitudes were determined through students' response to 11 statements.

Most of the students of 3rd and final year had received HBV vaccination with no significant difference in academic year (table-III).

Most of the students of 3rd and 4th year always used gloves (97.8%) while 71.9%, 58.4%, 58.4% and 68.5% used facemasks, eye wear, head caps and lab coats respectively.

About 78.6% students reported percutaneous injuries with a used instrument, significantly more third year than final year students reported such injuries (81.3% vs. 76%, p=5.67). Injuries with needles (55.1%) were most frequent (table-IV).

Many of the students undergo occupational exposures. More 3rd year than final year students undergo such injuries (table-V).

Table-III: HBV vaccination status.

Variables	3rd year	4th year	Total %	*p*-values
HBV Vaccine				
Yes	42	45	87 (97.8)	1
No	1	1	2 (2.2)	
No of Doses				
3	34	38	72 (80.9)	0.67
<3	9	8	17 (19.1)	
Post-HBV Serology				
Yes	24	26	50 (56.2)	1
No	19	20	39 (43.8)	

Table-IV: Percutaneous injuries with a used instrument.

Instruments	3rd year	Final year	Total %
Needle	22	27	49 (55.1)
Wire	3	5	8 (9)
Explorer	5	2	7 (7.9)
Wax knife/carver	3	1	4 (4.5)
Bur/endodontic file	2	0	2 (2.2)
None	8	11	19 (21.3)
Total	43	46	89 (100)

*p-value is non-significant (5.67).

Table-V: Preventive measures after exposure.

Variables	3rd year	Final year	Total %	*p*-value
Immediate washing of contaminated skin after exposure?				
Do	43	45	88 (98.9)	1
Don't	0	1	1 (1.1)	
Squeezing of injured area to induce bleeding?				
Do	36	45	81 (91)	0.02*
Don't	7	1	8 (9)	
Evaluate the contaminated skin for erosion, ulceration, or dermatitis?				
Do	39	46	85 (95.5)	0.05
Don't	4	0	4 (4.5)	
Evaluate source patient for risk factors of HIV, HBV and HCV?				
Do	41	44	85 (95.5)	1
Don't	2	2	4 (4.5)	

*p-value is significant only for second statement which is 0.02.

DISCUSSION

In current study 40.4% students obtained fair knowledge about infection control this study was similar to the study done in Iran (Mashhad (34.9 ± 13)[16], Bushehr (45%)[17]. On the other hand, this knowledge score was less as compared to studies done in Iran (Shiraz (74.55 ± 11)[18]). While this knowledge score was greater than the study done in Iran [Tehran (25%)[19]].

About 77.5% students showed positive attitude towards the treatment of patients with infectious diseases greater than the findings in Saudi Arabia (66%)[20,23] and in UAE[21].

The finding that most of the students of 3rd and 4th year (97.8%) had received HBV vaccination and 80.9% had completed the recommended three doses is similar to findings from dental schools in Jordan (95% vaccinated)[23] United Arab Emirates (95.8% vaccinated, 64.7% completed doses)[21] and Saudi Arabia (90.8% vaccinated, 80.3% completed doses)[22] while the number of students who completed recommended three doses is greater than these studies. More than half of the students (56.2%) reported post HBV serology greater than the findings in Iran[24] and UAE[21].

The high compliance with use of gloves, facemasks and somehow gowns reported in this study is similar to studies done in Saudi Arabia[20,22], Jordan[23], UAE[21] and Canada[25]. The use of protective eye wears (58.4%) is greater than the findings in Germany[26] and Bulgaria[29] but less than the findings in Brazil[28] and Canada[25].

About 78.6% students reported percutaneous injury with a used instrument is greater than findings in Saudi Arabia (65%)[20,22], UAE[21], Jordan[23], Brazil[28] while less than the findings in Canada[25].

Injuries with anesthetic needles was the most common cause similar to other findings[21,25].

Yunani *et al*[29] stated that sharp injuries are more common in dentistry than in other health professionals.

Among dental personnel, it is very important to limit infections of patients; It is considered to be one of the most effective methods of infection control.

Negligence regarding infection control is common problem and one of the leading cause of communication of lethal diseases in Pakistan and very few studies are done up till now that's why this study was done to analyze any shortcomings to overcome this issue.

It is important for any hospital and dental clinic to set up its own measures to prevent the spread of infectious and transmissible diseases. For this purpose, it is important that dental health care professionals should be aware of the risks and seriousness of infections[3].

CONCLUSION

A good attitude towards infection control among students of Allied Hospital was observed however they need more knowledge and awareness regarding dental infection and infection control in dentistry along with many improvements in clinical practices. Infection control is also about education of patients, their attendants and dental health personals regarding good preventive measures. However excellent educational training with command in notional infection control measures for undergraduate students will result in the execution of compatible strategies by future dentists.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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