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"Knowledge, Attitude and Practices towards Infection Control Measures amongst Students in A Private Dental College

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ABSTRACT

The control of cross-infection and cross-contamination has always been the topic of conversation in the dental schools. From time to time suggestions and submissions for infection control are reviewed in the light of available information. So as to cut down the risk of transmission of infection a sensible and practical routine for the prevention should be followed. Current study was done amongst undergraduate and postgraduate students with an aim to look over understanding and making use of it for infection control and sterilization procedures in a Private Dental college set-up. The study also had purpose to know how much knowledge about infection control procedures the students apply while working on patients. A close ended questionnaire was created to get information about infection control procedures from the respondents comprising of 300 dental students. Chi-square test was applied to statistically analyse the recorded data. ≤0.05p value was taken as significant. Females (75.6%) represented a larger proportion of the study population. Through the present study we found that the dental students had adequate information and they practice the correct measures for infection. Also they had positive attitude towards infectious control measures. However the results were found to be significantly better among postgraduate students and interns than final and third year students. Imparting Dental education is very important and this can assume an essential part in the preparation of dental specialists. So we have to guide them to embrace sufficient learning and demeanors identified with disease protection.

Key-words: *sterilization, disinfection, oral infection control, dental specialists*

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INTRODUCTION

In the environment of Dental clinic the infection spreads easily. Therefore absention of cross contamination is surely the major concern in dental practice[1]. Clinicians and dental clinic workers should be well versed with the basic guidelines of infection control and should strictly practice them. Dentists are at more likelihood of getting infected from numerous bacterial and viral infections [1, 2].

The Infections can be passed on in the clinics via various means, including straight exposure to blood, slobber or may be due to incidental exposure with defiled tools, operatory instruments, or from other ecological surfaces. Many a times avian adulterants found in splash or mist of oral fluids can cause the infection [3, 4].

Infection can occur through any of these routes but for that to occur a few prerequisite conditions have to be available including a susceptible host, a pathogen and a gateway through which the pathogen makes entry into the host. So if we employ potent infection control measures to break one or more of these links we can prevent the infection [5, 6].

According to the study conducted in late 1970, Dental surgeons in general are more prone to catch infections while treating their patients if they are not in habit of following proper measures for infection control [7]. Evidence also suggests that dental staff are highly prone of acquiring Hepatitis – B infection when compared with the general population. Also the inception of AIDS epidemic in the 1980's made the stringent precautions mandatory to adequately protect the frontline workers and the public [8. 9].

Amalgamation and expansion of various elements of standard precautions have been drawn to secure dental personnel and patients from infectious agents that can outspread by various body fluids [8, 9].

Wearing of gloves by dental professionals is mandatory element to prevent cross-infection in dentistry [10-12].

Infected blood might get retained beneath finger nails for may be upto 4 to 5 days and it is very tough to take off sully material off the hands, especially from the hyponychial and nail bed areas [13]. Diligent cleansing becomes necessary to clear the contamination from such areas.

Transdermal exposure involving HBV infected blood develops high risk of getting Hepatitis B infection as HBeAg has a steep viral replication rate and the large volume of flowing virus in the blood increases the risk from 22 to 31 percent [14].The chance for hepatitis C infection is comparatively less and is approximately 1.8 percent [15]. Patients with periodontitis might show higher probability of detection of surface antigen of HBV (HBsAg), anti-HBc, anti-HCV, or both anti-HCV and anti-HBc in whole unstimulated salivas [16, 17].

Transdermal traumas lead to a greater risk of spread of infection. It is believed that the risk of dying from infection in individuals is 1.7 times greater in case of Hepatitis B infection than HIV infection. This happens because in dentistry close packed instruments are used more and therefore dental professionals after injuries are exposed to a little bulk of blood and, hence are at less risk [18].

The contagion from soiled blood can thus spread from either patient to dentist or vice versa or it may also spread from one patient to another. But the chances of spread are maximum from sufferer to dental surgeon because dental surgeon often is exposed to the blood of patient and saliva while doing dental procedures [19-21].

More important than anything else is to sternly stick to the standard precautions and prevent spread of infection amongst the dentists. The covid times have made us learn more that how important is to strictly adhere to the standard norms including the use of eye protection with covers, respirators and protective apparel. Also the PPE (Personal Protective Equipment) and respirators have become the need of the hour. Though the emphasis is being laid from so many years to strictly follow and adhere to standardized infection control procedures, but before the emergence of Covid era only a few dental surgeons were conscious and followed them in their clinical practice.

Dental schools and therefore Dental Education becomes important when there comes the need to understand the importance of imparting knowledge about standardized infection control procedures. We as part of Dental fraternity should help in inculcating sufficient knowledge and right attitude amongst future Dentists related to infection control measures [21-23]. With this aim, we did this survey to assess the knowledge, attitude and practices of under-graduate and post-graduate students of a private Dental College towards infection control measures so that training modules can be designed in future for safer and more effective delivery of dental care.

MATERIAL AND METHODS

The present study was conducted amongst third and final year undergraduate students, interns and postgraduates of a Private Dental College with the help of a questionnaire.

Thirty-one (31) students of third BDS, eighty-one (81) students of final BDS, one hundred and thirty four (134) interns and fifty four (54) postgraduate students participated in the study. 300 dental students made the study population for the study and by choice they filled the questionnaire. A self-administrated questionnaire (Annexure 1) was made by taking help from experts in the field. Taking care of the study group the questionnaire was framed consisting of 15 close ended items. Undergraduates were asked to fill the questionnaire in 20 minutes in their respective classrooms without discussing amongst themselves. Interns and postgraduates were asked to fill their questionnaire in the individual Departments. The questions were designed to collect the information students had about the practices they follow for infection control.

The participants gave their consent before commencement of the study and ethical clearance was granted for the study. The validity of the questionnaire was evaluated before its application using Cronbach's alpha internal consistency coefficient 0.85.

Statistical Package for Social Sciences (SPSS) software for Windows version 20.0 was used as a tool to do statistical analysis. Chi-sqaure test was applied to statistically analyse the recorded data. ≤0.05 p value was taken as significant.

RESULTS

A sum of 300 students of a Dental College in Gurgaon participated in the study. The students were divided on the basis of gender. Females 227(75.6%) represented a larger proportion of the study population. Students were further divided on the basis of year (batch) of their study. Out of these interns were maximum 134 (44.6%) followed by Final Year students who were 81 (27%) and postgraduate students 54 (18%) respectively. **(Table 1)**

Table 1: Distribution of dental students in study according to gender and year

Year	Gender (n%)		Total (%)
	Male	Female	
3rd year	06 (19.3)	25 (80.6)	31 (10.3)
4th year	23 (28.3)	58 (71.6)	81 (27)
Interns	31 (23.1)	103 (76.8)	134 (44.6)
PG	13 (24.07)	41 (75.9)	54 (18)
Total	73 (24.3)	227 (75.6)	300 (100)

(Table 2) summarises frequency of student's answers regarding their knowledge, attitude and practices of undergraduate and postgraduate students about infection control practices based on their gender. It showed almost similar knowledge between males and females as result for majority of questions came out to be non significant (p>0.05)

Table 2: Students' knowledge, attitudes, and practice regarding infection control measures, by number and percentage of total respondents to each item based on gender

Question	Options	Male n (%)	Female n(%)	Total n(%)	p Value
Q1	Yes	65 (23.9)	206 (76.01)	271 (90.3)	0.66
	No	08 (27.5)	21 (72.4)	29 (9.6)	
Q2	Yes	34 (21.6)	123 (78.3)	157 (52.3)	0.29
	No	40 (27.9)	103 (72.02)	143 (47.6)	
Q3	Yes	49 (23.3)	161 (76.6)	210 (70)	0.53
	No	24 (26.6)	66 (73.3)	90 (30)	
Q4	Yes	25 (30.4)	57 (69.5)	82 (27.3)	0.12
	No	48 (22.01)	170 (77.9)	218 (72.6)	
Q5	Boiling	04 (33.3)	08 (66.6)	12 (4)	0.52
	Autoclave	68 (23.7)	218 (76.2)	286 (95.3)	
	Chemicals	00	00	00 (0)	
	Dry heat	1(50)	1(50)	02 (0.6)	
Q6	Tap water	09 (47.3)	10 (52.6)	19 (6.3)	0.004*
	Solid soap with water	24 (33.8)	47 (66.1)	71 (23.6)	
	Liquid wash	31 (17.6)	145 (82.3)	176 (58.6)	
	Disinfectant	09 (26.4)	25 (73.5)	34 (11.3)	
Q7	All patients	67 (24.4)	207 (75.5)	274 (91.3)	0.40
	On selected patients	06 (28.5)	15 (71.4)	21 (7)	
	On demand	00	05 (100)	05 (1.6)	
	Occasionally	00	00	00 (0)	
Q8	All patients	70 (24.8)	212 (75.1)	282 (94)	0.78
	On selected patients	02 (16.6)	10 (83.3)	12 (4)	
	On demand	01 (25)	03 (75)	04 (1.3)	
	Occasionally	00	02 (100)	02 (0.6)	
Q9	For every patient	13 (26.5)	36 (73.4)	49 (16.3)	0.29
	While doing restorative procedures	21 (30.8)	47 (69.1)	68 (22.6)	
	While doing surgical procedures	04 (13.7)	25 (86.2)	29 (9.6)	
	Does not use	35 (22.7)	119 (77.2)	154 (51.3)	
Q10	Yes	50 (22.6)	171 (77.3)	221 (73.6)	0.32
	No	24 (30.3)	55 (69.6)	79 (26.3)	
Q11	Hepatitis B	50 (21.6)	181 (78.3)	231 (77)	0.22
	TB	20 (32.2)	42 (67.7)	62 (20.6)	
	HIV	02 (40)	03 (60)	05 (1.6)	
	Herpes	01 (50)	01 (50)	02 (0.6)	
Q12	Yes	51 (31.5)	186 (78.4)	237 (79)	0.02*
	No	22 (34.9)	41 (65.07)	63 (21)	
Q13	Yes	50 (20.9)	189 (79.07)	239 (79.6)	0.006*
	No	23 (37.7)	38 (62.2)	61 (20.3)	
Q14	Teachers	25 (18.7)	108 (81.2)	133 (44.3)	0.13
	Books	40 (27.2)	107 (72.7)	147 (49)	
	CDE Prog	05 (41.5)	07 (58.3)	12 (4)	
	Seniors	03 (37.5)	05 (62.5)	08 (2.6)	
Q15	Yes	61 (22.5)	210 (77.4)	271 (90.3)	0.02*
	No	12 (41.3)	17 (58.6)	29 (9.6)	

Chi-square test;*p≤0.05 (significant)

(Table 3) presents the results to all questions by all the students who participated in this study on the basis of year (batch) of their study. **Highly statistical significant** difference **(p<0.05)** came out among the students. It might be accredited to the fact that interns and postgraduate students have better knowledge than third and fourth year students.

Table 3:Students' knowledge, attitudes, and practice regarding infection control measures, by number and percentage of total respondents to each item based on year(batch) of study

Question	Options	3rd year n(%)	4th year n(%)	Interns n(%)	Post graduates n(%)	Total n(%)	p Value
Q1	Yes	20 (7.3)	79 (29.1)	121 (44.6)	51 (18.8)	271 (90.3)	<0.001*
	No	11 (37.9)	02 (6.8)	13 (44.8)	03 (10.3)	29 (9.6)	
Q2	Yes	07 (4.4)	42 (26.7)	78 (49.6)	30 (19.1)	157 (52.3)	0.004*
	No	24 (16.7)	39 (27.2)	56 (39.1)	24 (16.7)	143 (47.6)	
Q3	Yes	15 (7.1)	57 (27.1)	102 (48.5)	36 (17.1)	210 (70)	0.02*
	No	16 (17.7)	24 (26.6)	32 (35.5)	18 (20)	90 (30)	
Q4	Yes	08 (9.7)	27 (32.9)	36 (43.9)	11 (13.4)	82 (27.3)	0.41
	No	23 (10.5)	54 (24.7)	98 (44.9)	43 (19.7)	218 (72.6)	
Q5	Boiling	04 (33.3)	06 (50)	02 (16.6)	00 (0)	12 (4)	
	Autoclave	26 (9.09)	75 (26.2)	132 (46.1)	53 (18.5)	286 (95.3)	0.004*
	Chemicals	00 (0)	00 (0)	00 (0)	00 (0)	00 (0)	
	Dry heat	01 (50)	00 (0)	00 (0)	01 (50)	02 (0.6)	
Q6	Tap water	04 (21.05)	05 (26.3)	07 (36.8)	03 (15.7)	19 (6.3)	
	Solid soap with water	05 (7.04)	15 (21.1)	38 (53.5)	13 (18.3)	71 (23.6)	0.26
	Liquid wash	20 (11.3)	47 (26.7)	79 (44.8)	30 (17.04)	176 (58.6)	
	Disinfectant	02 (5.8)	14 (41.1)	10 (29.4)	08 (23.5)	34 (11.3)	
Q7	All patients	29 (10.5)	81 (29.5)	116 (42.3)	48 (17.5)	274 (91.3)	
	On selected patients	00 (0)	00 (0)	15 (71.4)	06 (28.5)	21 (7)	0.002*
	On demand	02 (40)	00 (0)	03 (60)	00 (0)	05 (1.6)	
	Occasionally	00 (0)	00 (0)	00 (0)	00 (0)	00 (0)	
Q8	All patients	26 (9.2)	77 (27.3)	129 (45.7)	50 (17.7)	282 (94)	
	On selected patients	03 (25)	01 (8.3)	04 (33.3)	04 (33.3)	12 (4)	0.05*
	On demand	02 (50)	02 (50)	00 (0)	00 (0)	04 (1.3)	
	Occasionally	00 (0)	01 (50)	01 (50)	00 (0)	02 (0.6)	
Q9	For every patient	08 (16.3)	22 (44.8)	07 (14.2)	12(24.4)	49 (16.3)	
	While doing restorative procedures	06 (8.8)	24 (35.2)	29 (42.6)	09 (13.2)	68 (22.6)	<0.001*
	While doing surgical procedures	01 (3.4)	08 (27.5)	12 (41.3)	08 (27.5)	29 (9.6)	
	Does not use	16 (10.3)	27 (17.5)	86 (55.8)	25 (16.2)	154 (51.3)	

Q10	Yes	21 (9.5)	56 (25.3)	106 (47.9)	38 (17.1)	221 (73.6)	0.28
	No	10 (12.6)	25 (31.6)	28 (35.4)	16 (20.2)	79 (26.3)	
Q11	Hepatitis B	20 (8.6)	69 (29.8)	93 (40.2)	49 (21.2)	231 (77)	
	TB	09 (14.5)	10 (16.1)	39 (62.9)	04 (6.4)	62 (20.6)	0.004*
	HIV	01 (20)	02 (40)	02 (40)	00 (0)	05 (1.6)	
	Herpes	01 (50)	00 (0)	00 (0)	01 (50)	02 (0.6)	
Q12	Yes	18 (7.5)	61 (25.7)	113 (47.6)	45 (18.9)	237 (79)	0.008*
	No	13 (20.6)	20 (31.7)	21 (33.3)	09 (14.2)	63 (21)	
Q13	Yes	11 (4.6)	69 (28.8)	115 (48.1)	44 (18.4)	239 (79.6)	<0.001*
	No	20 (32.7)	12 (19.6)	19 (31.1)	10 (16.3)	61 (20.3)	
Q14	Teachers	17 (12.7)	37 (27.8)	63 (47.3)	16 (12.03)	133 (44.3)	
	Books	12 (8.1)	41 (27.8)	62 (42.1)	32 (21.7)	147 (49)	0.28
	CDE Prog	02 (16.6)	02 (16.6)	04 (33.3)	04 (33.3)	12 (4)	
	Seniors	00 (0)	01 (12.5)	05 (62.5)	02 (25)	08 (2.6)	
Q15	Yes	31 (11.4)	63 (23.2)	126 (46.4)	51 (18.8)	271 (90.3)	<0.001*
	No	00 (0)	18 (62.06)	08 (27.5)	03 (10.3)	29 (9.6)	

Chi-square test;*p≤0.05 (significant)

DISCUSSION

Though the degree of awareness about infection control was found to be satisfactory amongst the group of students studied but still adequate training is the need of the hour.

There are many studies [24, 25, 26] indicating the inadequate information and inappropriate viewpoint regarding infection control practices amid dentists but the present study showed fairly good awareness about infection control amongst students. It was, however, found to be significantly better among postgraduate students and interns than final and third year students. It might be accredited to the reality that interns and postgraduate students have better knowledge and better training in infection control than third and fourth year students. This was in line with the study of Sharma M et al 2017[27] as their study also showed that the knowledge was better amongst postgraduates than undergraduates. This mirrored with the fact that students' forget things over time. This discovery emphasizes on the significance and requirement of meticulous infection control training before the students graduate. This essential topic of infection control mandatorily needs a dynamic attitude all around the course.

The questionnaire for the present study was made with keeping in mind the different facets of infection control practices and it ensured the attainment of the objective of each of these measures. In our study the implementation of different cross infection control measures was above average and was in line with the study done by Sharma M et al 2017[27]. This claim was supported by the usage of gloves and facemasks by the participants regularly which was more than 90%.

The use of gloves and facemasks was fairly common as per the results of present study and more than 90% students wore gloves and facemasks before examining every patient. But the usage of eye glasses was more uncommon than use of facemasks and gloves. 51.3 % were not using them as per our results. These proportions were similar to the previous studies of Alruwaili MM et al and Sharma et al [27, 28]. Actually the scholars are though encouraged to use all the given protocols for sterilization and disinfection measures, but the more emphasis is given for using mouth masks and gauntlets in the dental colleges. Rarely students are seen wearing protective eye shields and clothing. The pandemic has now changed the overall situation. All the mandatory guidelines are now being followed. Though the use of PPE has been always recommended but only the Covid times have made everyone realise its significance.

We always teach our students to scrub their hands with disinfectant before and after examining the patient but as low as 11.3 % were only found to be using it. Also it was found that most students (95.3

percent) used autoclaved sterilize instruments. A ten-year long study conducted by Henrique et al[29] to evaluate attitude and conduct of dental scholars towards infection control rules showed that though in 1995, maximum students used autoclaved instruments (83.8 percent), but the percentage has increased to 95.9 % in the year 2005. In this study also the good knowledge about the sterilization procedure was revealed.

Since long time the Dental council of India has made the vaccination for Hepatitis B mandatory for all the dental students before their admit in the dental Schools, but to our utter surprise still 20% of them are not vaccinated. The number is significantly less than that found in the previous study by Singh A et al in 2011[1]. More than 70% of the participants are aware about the severity of Hepatitis B infection and they also use separate instruments for such patients. So the present study revealed that students are getting more aware about the disease and its spread.

When asked about the source of knowledge about infection control practices, majority of the participants answered in favour of Books and Teachers. Students follow their seniors and teachers. So teachers should know about all the minute details about the subject and they should keep themselves updated with all the newer techniques available in the market. They should keep conducting Workshops, seminars, Webinars, CDE Programmes so that keep themselves as well as the students reburnished.

Another area of concern is the Immunization. Immunization of Dental health care practitioners before they start practicing is the most effective way of keeping them disease free and can subsequently reduce the further transmission of infectious diseases[30]. Hence vaccination/Immunization should be made a mandatory for all prevention and infection control programs. With the emergence of pandemic we have all of a sudden realised that how we have neglected this in the past and therefore mandatory vaccination is recommended now to all dental students before they enter clinics. If we successfully do so, we can protect both health care professionals as well as patients and their families.

Though the attitude for practicing infection control was found to be good in the present study but a better amenability is needed. Meticulous preparedness for undergraduates by the educators is highly recommended. We have come very far but still there is lack of training for infection control in India. These studies should be administered in other colleges at regular intervals. The major limitation of such surveys is that we only assess the knowledge through their responses. If we could supervise them during their practice it would be better as then we will not rely on their self-assessment. To ensure constancy, competency and efficacious coordination of activities there should be clearly written policies, procedures, and guidelines.

CONCLUSION

In spite of the knowledge the students have their attitude towards infection control is sometimes very disheartening. Their carefree attitude sometimes is the reason for so many infectious diseases spreading among the dentists. So though the various guidelines are known to everyone but they are not ready to practice them. Here, Dental education becomes important and can assume an essential part in the preparation of dental specialists. We have to guide them to embrace sufficient learning and demeanors identified with disease control measures.

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Annexure 1

Questionnaire

Knowledge Attitude and Practices towards Infection Control Measures amongst students in a Private Dental College

Name: **Age:** **Gender** **Male** – **Female** **Year:**

III BDS
Final BDS
Interns
PG's

1. Are you aware of Universal precautions and use of personal protective equipments?
a. Yes b. No
2. Do you know about organization which provides information for sterilization?
a. Yes b. No
3. Did you go through intense training and lectures on Sterilization and disinfection p before entering clinics?
a. Yes b. No
4. Do you prefer to use disinfectant over sterilization?
a. Yes b. No
5. Which method do you use for sterilization?
a. Boiling b. Autoclaving c. Chemicals d. Dry Heat
6. What do you use for washing hands?
a. Tap water b. Solid soap with water c. Liquid wash d. Disinfectant
7. Do you use gloves for?
a. All patients
b. On selected patients
c. On demand
d. Occasionally
8. How often do you use facemask in clinics?
a. For All patients
b. On selected patients
c. On demand
d. Occasionally
9. How often do you use glasses for eye protection?
a. For every patient
b. While doing restorative procedures
c. While doing surgical procedures
d. Does not use
10. Do you use different pouches for Instruments?
a. Yes b. No
11. Which infection do you think Dentists are most likely to get infected with?
a. Hepatitis B b. Tuberculosis c. HIV d. Herpes
12. Do you use separate instruments for Hepatitis patients?
a. Yes b. No
13. Have you been immunized against Hepatitis B before entering clinics?
a. Yes b. No
14. From where do you get information regarding Sterilization and Disinfection?
a. From Teachers b. From Books c.CDE Programs d. From Seniors
15. Do you think there should be more emphasis and training on infection control during dental curriculum and CDE Program on the same should be conducted.
a. Yes b. No

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