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# Awareness of Infection Control among Paradental Staff of College of Dental Sciences, Davangere: A Cross-Sectional Study

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## ABSTRACT

**Background**: Blood-borne infections such as hepatitis B, hepatitis C and HIV might be transmitted from one individual to another during dental procedures. Therefore, sterilization and personal protection procedures are of utmost significance in dental offices. The importance of awareness of cross-infection and antiseptic principles lies in the fact that in most cases it is not possible to identify patients with hepatitis or AIDS.

**Aim:** The aim of the present study was to evaluate awareness of infection control procedures among paradental staff of College of Dental Sciences, Davangere.

**Materials and Methods:** In this descriptive study, 82 paradental staff members working in different departments of College of Dental Sciences, Davangere were included. Data was collected by means of a self-administered questionnaire, which included respondents' personal profile except name to make survey anonymous and questions on infection control, sterilization and waste management methods.

**Results:** There were statistically significant differences in the level of knowledge and attitude of paradental staff members regarding infection control.

**Conclusion:** The results of the present study suggest that in some cases paradental staff neglect the principles for personal protection and cross-infection control. Therefore, our society is subject to widespread infection in dental offices and clinics. This potential risk necessitates careful monitoring along with government support of treatment procedures, the inclusion of infection control costs into treatment expenses and an emphasis on continuing education about infection control procedures through seminars and congresses.

**Keywords:** Hepatitis A Virus, Hepatitis B Virus, Hepatitis C Virus, Human Immunodeficiency Virus, Infection Control, Cross sectional Study.

## INTRODUCTION

Patients, dentists and auxiliaries of all groups are at risk every time they enter the dental clinic. While some of the risks are inevitable, others are. Risk of transferring infection from one individual to another exists in many instances.[1] Vast range of microorganisms, from prions through viruses and bacteria to fungi are the risk factors which spread via the saliva-borne route and through direct contact.[2] A high risk of occupational hazards of infectious diseases to practitioners and staff of the dental office are as a result of continuous contact with infectious material during dental procedures

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which range from common cold to life-threatening diseases such as tuberculosis, hepatitis and AIDS.[3] Dentistry has come a long way in infection control practices and safety still patients with infectious diseases continue to be treated with different infection control methods which does not match with the Occupational Safety and Health Administration (OSHA) guidelines.[4] OSHA released the final standards on employee safety against bloodborne pathogens.[5] Therefore, dental practitioners and auxiliaries must gain a sound knowledge of infection control. Medically advanced countries has achieved control of communicable diseases through education, regulations, and public health measures such as dental infection control and safety. [5] Anyone who has an opportunity for contact with patients or medical equipment (e.g., nursing and medical staff; therapists and technicians, housekeeping and maintenance staff; and students) must be provided with education on the principles and practices for preventing transmission of infectious agents and that should begin during training in the health professions.[6] Hence, the aim of present study was to know the awareness of infection control among paradental staff at college of dental sciences, Davangere city, Karnataka, India.

## MATERIALS AND METHOD

Present study used a questionnaire-based cross sectional survey to assess knowledge, attitude and practice of infection control among all paradental staff working at College of Dental sciences, Davangere city, Karnataka. List of paradental staff was obtained from administrative office, College of Dental sciences. Questionnaire format included participants' information like age, sex, designation and also fifteen close ended questions regarding knowledge, attitude and practice of infection control. Respondent's name was not recorded in order to ensure anonymity and also they were assured of integrity of data. On first visit, all paradental staff were approached at their respective department, purpose and nature of the study was explained to them and informed consent was obtained. Questionnaires were distributed and all the questions were explained to avoid any ambiguity. Respondents were requested to fill questionnaires according to their infection control practices at their work place. They were assured of the confidentiality of their responses and were requested to give the appropriate answers. The filled proformas were collected on the consecutive day. A second visit was paid to meet the paradental staffs who were not available on the first visit, and the same procedure was followed to get the proformas filled. Questionnaire proformas were distributed among a total of 90 paradental staff, out of which 71 responded within due time. Necessary ethical clearance was obtained from the ethical clearance committee of College of Dental Sciences, Davangere.

### Statistical analysis

The data was subjected to computerized statistical analysis using the statistical software package SPSS (Chicago, IL, USA) version 17.0 for MS Windows & $P \leq 0.05$ was considered statistically significant. Chi square test was used to analyze the basic infection control practices with respect to the demographic variables.

## RESULTS

### Profile of respondents

The respondents were in age range of 22 to 58 years with a mean age of 26.12 years and a Standard Deviation of 2.9 years.

### Knowledge regarding infection control

92.6% of respondents answered 'YES' when they were asked, "When asked have you ever heard of infections like HIV, Hepatitis-B?" 90.1% of respondents were aware that infection can spread while handling instruments. 87.7% of respondents knew how to do sterilization and disinfection. 81.5% of respondents were aware of infectious waste disposal guidelines. Most of the respondents **(85.2%)** believe that dental office should be bright and ventilated**.**

### Attitude and Practice towards infection control

### Barrier techniques:

Among all operating paradental staff, majority of them were always changing gloves and face masks (85.2%) when they treat patients and 77.8% said that they always use protective eye wear. A total of

63.0% reported, they don't change their apron daily.

**Infection control procedures:**

Significant number of the respondents (60.5%) answered 'Red container' when they were asked about where to dispose blood soaked gauze. 75.3% answered that they do sterilization before and after treating patient whereas 12.3% said they do sterilization before treating the patient. 85.2% said that autoclave is the best method for sterilization. 80.2% said they use hand sanitizer regularly. 82.7% of respondents said they disinfect working surfaces after each patient. 67.9% of respondents said they routinely disinfect impression prior to pouring.

**Hepatitis B vaccination:**

When asked "Are you vaccinated against Hepatitis-B? "Almost all (87.7%) responded "Yes".

## DISCUSSION

Infection control is a multi-step process and protocol should be updated to include good: identification of high-risk patient populations, barrier technique, aseptic technique, surface disinfection, instrument sterilization, and equipment disinfection and sterilization.[7] Clinical practice guidelines proposed by regulatory and advisory agencies to promote safety in the implementation of patient care, are evidence-based recommendations. In 2003, the Centers for Disease Control (CDC) developed and issued such Infection Control Guidelines (ICG) in Dental Health-Care Settings[8] as dental practice has been one of the identifiable source of cross infections.[9] Centers for Disease Control and Prevention (CDC) introduced the concept of universal precautions which is a key element of infection control to reduce the risk of transmission of blood-borne pathogens in health care settings.[4] Knowledge, attitudes and practices and compliance with ICG among nurses and hospital personnel has been studied extensively over a period of time and findings are suggestive of low compliance which raises a question about the health and safety of workers and patients.[8] Various written reports have shown that the most common biosafety problem is related to the behavior of professionals and not the available technology to eliminate or minimize risks.[10]

Results of this study provide a valuable insight in to current practices in the basic infection control as well as corresponding need to educate the paradental staffs to achieve certain improvements. Overall response rate in present study was nearly 100% which can be attributed to anonymous nature of the study.

**Barrier technique**

A high level of gloves and mask (85.2%) use was reported in present study which is comparable to previous studies conducted in Canada, New Zealand, turkey and Ireland in 1990s.[11-14] Though use of facemask is 85.2% in present study which is high compared to 50% reported by Elkarim at el. in Khartoum, Sudan in 2004[12], and much lower compared to 92% that reported by Ozturk et al. in Turkey, in 2003[15], rests of the paradental staff should be encouraged to use facemask and gloves to protect themselves against air-borne and other nosocomial infections. Adequate eye protection is necessary to protect against aerosol, splatter and physical injuries from flecks of calculus etc.[15] Use of protective eye-wear (77.8%) was reported in present study and it was noted that those who wore gloves and mask regularly also used protective eye-wear regularly which is comparable to that reported by Ozturk et al. in Turkey, in 2003.[15] For more than a century, health care providers' hands have been recognized as major reservoirs of pathogens that may cause clinical infections. Hand hygiene (HH) is a primary practice used to reduce the risk and spread of infection.[16] The two major hand antiseptics in use today are alcoholic rubs and medicated soaps or foams containing chlorhexidine.[17]

Alcohols have the most rapid antimicrobial effect and are, in contrast to chlorhexidine, equally effective against gram-positive and gram-negative microorganisms.[18] Use of hand sanitizer (80.2%) was reported in present study which is higher compared to (48.5%) reported by Niak S et al. in India among general dentist, in 2014.[19] In a study conducted by King TB and Muzzin KB *et al.* in 2005 reported that 68.9% of respondents used safety glasses, 41% used protective eyewear, 93.2% used facemask and almost 100% have worn gloves always.[20]

Table 1: Table Showing Frequency and Percent Wise Distribution of Responses.

| Sl. no | Question | Responses | Frequency | Percent (%) |
|---|---|---|---|---|
| 1 | Have you ever heard of infections like HIV, Hepatitis-B? | Yes | 75 | 92.6 |
| | | No | 6 | 7.4 |
| 2 | Are you aware that infection can spread while handling instruments? | Yes | 73 | 90.1 |
| | | No | 8 | 9.9 |
| 3 | Do you know how to do sterilization and disinfection? | Yes | 71 | 87.7 |
| | | No | 10 | 12.3 |
| 4 | Are you aware of infectious waste disposal guidelines? | Not Responded | 1 | 1.2 |
| | | Yes | 66 | 81.5 |
| | | No | 14 | 17.3 |
| 5 | Where should you dispose blood soaked gauze? | Not Responded | 10 | 12.3 |
| | | Red | 49 | 60.5 |
| | | Yellow | 10 | 12.3 |
| | | Black | 12 | 14.8 |
| 6 | Do you know when you should do sterilization? | Not Responded | 10 | 12.3 |
| | | Before Treating Patient | 10 | 12.3 |
| | | Before & After Treating Patient | 61 | 75.3 |
| 7 | Which is the best method for sterilization? | Not Responded | 10 | 12.3 |
| | | Autoclave | 69 | 85.2 |
| | | Hot Air Oven | 2 | 2.5 |
| 8 | Do you change gloves and mask after each and every patient? | Not Responded | 10 | 12.3 |
| | | Yes | 69 | 85.2 |
| | | No | 2 | 2.5 |
| 9 | Do you use protective eye wear while working on patient? | Not Responded | 10 | 12.3 |
| | | Yes | 63 | 77.8 |
| | | No | 8 | 9.9 |
| 10 | Are you vaccinated against Hepatitis-B? | Not Responded | 10 | 12.3 |
| | | Yes | 71 | 87.7 |
| | | No | 0 | 0 |
| 11 | Do you change your apron daily? | Not Responded | 10 | 12.3 |
| | | Yes | 20 | 24.7 |
| | | No | 51 | 63.0 |
| 12 | Do you use hand sanitizer? | Not Responded | 12 | 14.8 |
| | | Yes | 65 | 80.2 |
| | | No | 4 | 4.9 |
| 13 | How should be a dental office? | Not Responded | 10 | 12.3 |
| | | Dark & Closed | 2 | 2.5 |
| | | Bright & Ventilated | 69 | 85.2 |
| 14 | Do you disinfect working surfaces after each patient? | Not Responded | 10 | 12.3 |
| | | Yes | 67 | 82.7 |
| | | No | 4 | 4.9 |
| 15 | Do you routinely disinfect impression prior to pouring? | Not Responded | 14 | 17.3 |
| | | Yes | 55 | 67.9 |
| | | No | 10 | 12.3 |

**Infection control procedures**

The concept of sterilization in the medical field had brought down the mortality and morbidity rate but strict practice of disinfection remains questionable, either due to ignorance or negligence.[21] Contaminated environmental surfaces are important sources for transmission of pathogens.[6] Isolation of HIV viral particles from saliva is one of the primary screening methods for HIV infection.[22] Bacteria and viruses from the patient's mouth travel with dental splatter and spills which can contaminate dental operatory.[23] In present study, regular disinfection (82.7%) of operatory was reported which is higher than that reported by Elkarim at el. in Khartoum, Sudan in 2004.[12] Devy et al. in 2016 reported that all

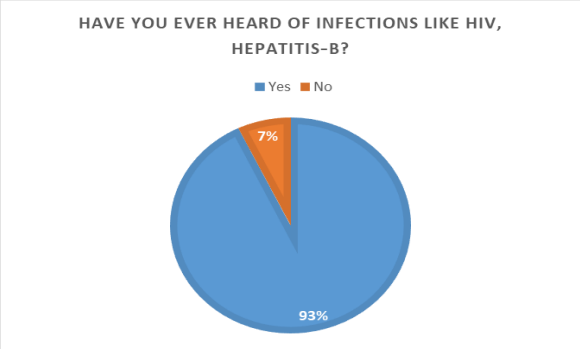


Fig 1: Have you ever heard of infections like HIV, Hepatitis-B?

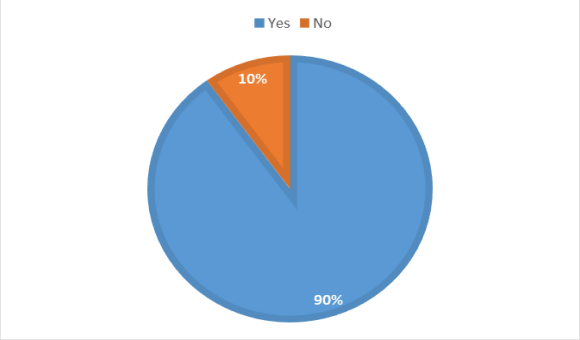


Fig 2: Are you aware that infection can spread while handling instruments?

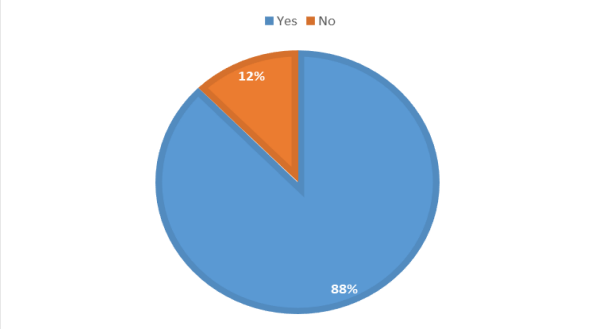


Fig 3: Do you know how to do sterilization and disinfection?

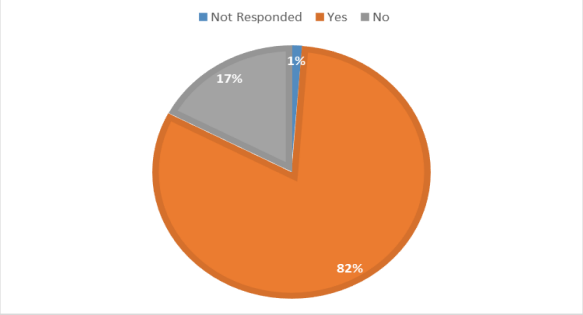


Fig 4: Are you aware of infectious waste disposal guidelines?

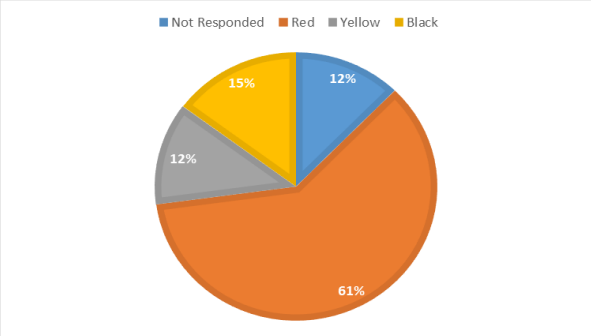


Fig 5: Where should you dispose blood soaked gauze?

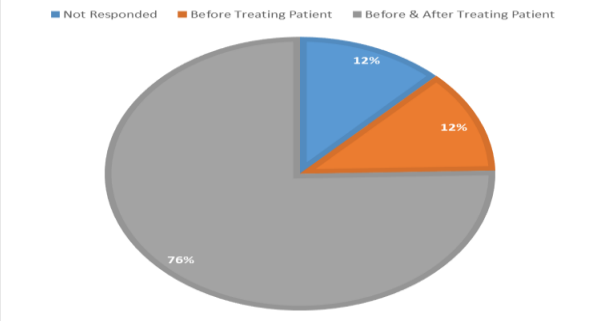


Fig 6: Do you know when you should do sterilization?

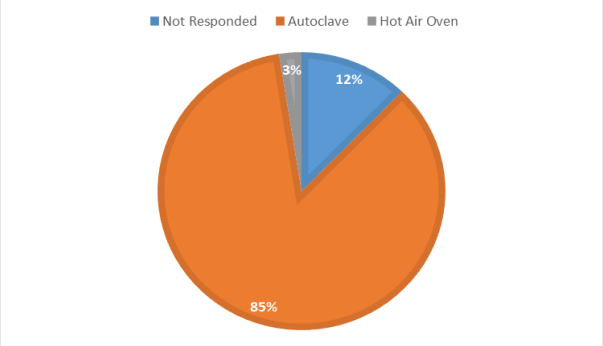


Fig 7: Which is the best method for sterilization?

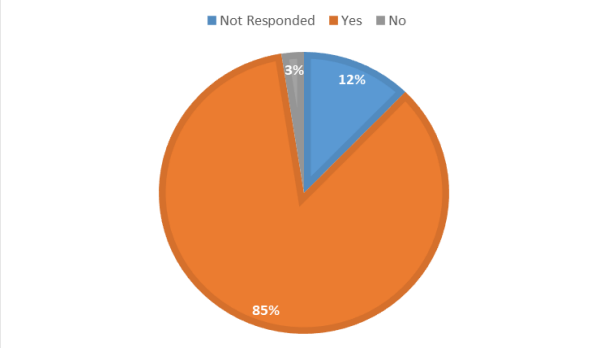


Fig 8: Do you change gloves and mask after each and every patient?

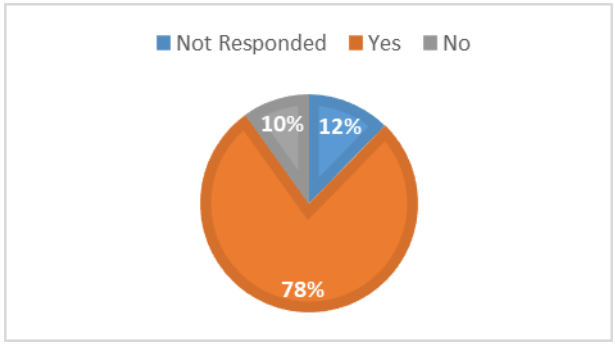


Fig 9: Do you use protective eye wear while working on patient?

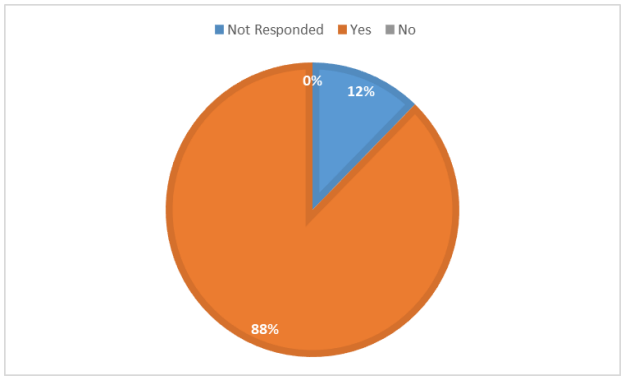


Fig 10: Are you vaccinated against Hepatitis-B?

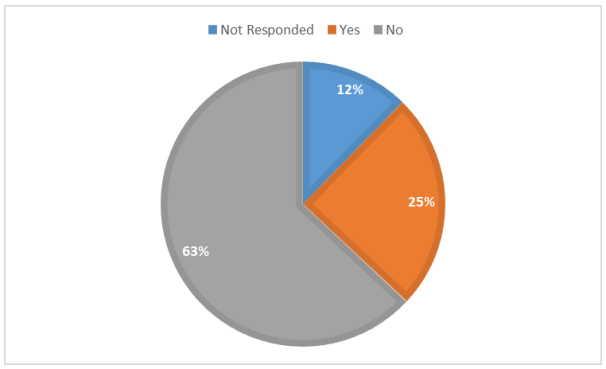


Fig 11: Do you change your apron daily?

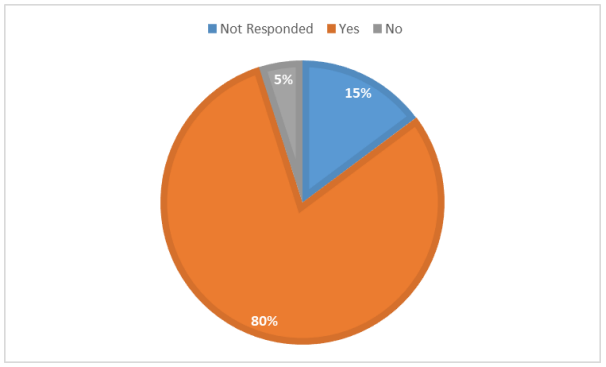


Fig 12: Do you use hand sanitizer?

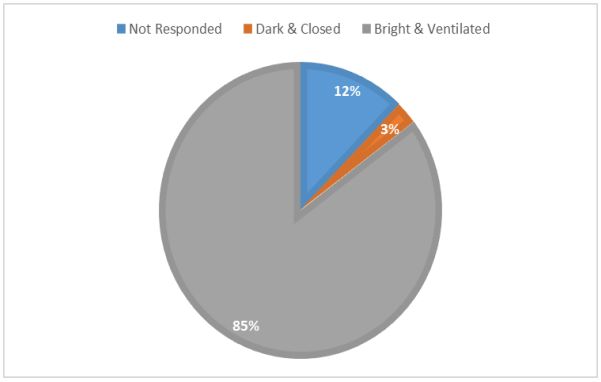


Fig 13: How should be a dental office?

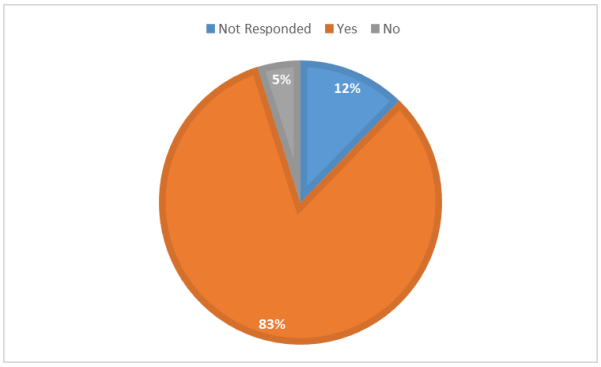


Fig 14: Do you disinfect working surfaces after each patient?

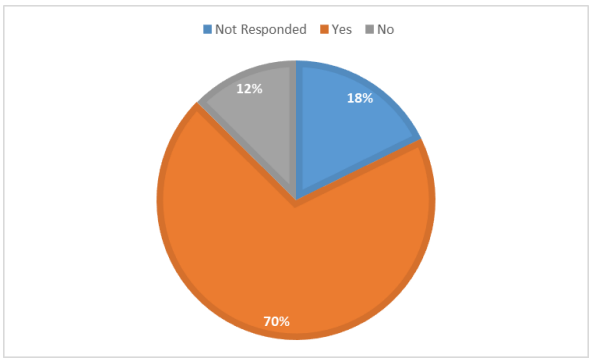


Fig 15: Do you routinely disinfect impression prior to pouring?

dental students responded that autoclave is the best method of sterilization where in present study, it was reported that 85.2% Autoclave, 2.5% Hot Air Oven and others didn't responded. 85.2% is quite higher rate than reported in previous studies conducted by Verrusio AC et al. in 1989 in US.[24] Present study showed that 75.3% of respondents do sterilization before and after treating patient whereas 12.3% do sterilization before treating the patient such thing has not been reported in any other study. Disinfection of dental impressions

must be undertaken to prevent transmission of bloodborne viruses to members of the dental team.[25] Devy et al. in 2016 reported that Nearly (94.16%) of the dental students were aware about the category of the waste materials and their management however, the awareness regarding blood/body spill was highly lacking among dental students which is comparable to present study that (81.5%) of respondents were aware about the infectious waste disposal guidelines but only (60.5%) answered 'Red container' when they were asked about where to dispose blood soaked gauze which identified the need to educate students as well as paradental staff regarding practical use of infectious waste disposal guidelines.[21] 67.9% of respondents in present study reported that they disinfect impression prior to pouring which is higher than reported by Almortadi N in 2010 that irrespective of the disinfection status of the received impressions, 50% of the responding dental technicians disinfected all impressions.[25] White coats are a potential source of cross infection, especially in surgical areas.[26] White coats of medical students are more likely to be bacteriologically contaminated at points of frequent contact, such as the sleeve and pocket.[27] In present study, only 24.1% of respondents changed their apron daily, such low response for this question may be due to different perceptions among respondents from different departments so a different question “how frequently do you change your apron?” can be asked as it was concluded in a study conducted by There is little microbiological reason for recommending a more frequent change of white coat than once a week, nor for excluding the wearing of white coats in non-clinical areas.[26] Each and every body working in a clinical environment must be vaccinated against hepatitis B.

## CONCLUSION

Though it was found that knowledge, attitude and practice of infection control was adequate among all paradental staff irrespective of department, timely continuing education program should be conducted to disseminate and update them regarding contemporary infection control practices.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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