

## Trend of Wearing Personal Protective Equipment by dentists in Karachi, Pakistan.

### **ABSTRACT:**

#### **Objectives:**

To investigate the trend of wearing personal protective equipment by dentists in Karachi, Pakistan.

#### **Methodology:**

Study was conducted over a period of three months in Karachi. Study included dentists working in Dental practices. Dental students and dentists not registered with Pakistan Medical and Dental Council were excluded from the study. The total filled questionnaires obtained were 251. Data analysis as done on SPSS version 20.0 and chi square test was used to assess difference amongst dentists.

#### **Results:**

The trend of wearing personal protective equipment such as gloves, mask and protective eye wear showed statistically significant differences amongst dentists. More over disposal of sharp objects and disinfection of surfaces between patients also significantly varied amongst dentists working in different places.

#### **Conclusions:**

Dentists working in different work places showed great variation in wearing personal protective equipment during dental procedures

**Key Words:**

Sterilization, Disinfection, cross infection control

## **1.INTRODUCTION**

It is important to follow infection control policies to create a safe environment for patients and health care workers. Health care providers and patients are exposed to infectious agents due to improper disinfection, sterilization and use of personal protective equipment. Untrained and inefficient health care workers can also lead to poor implementation of infection control policies.

Infection can spread by Direct and Indirect contact through different routes. The different routes are from Patients to doctors, doctors to patients and patients to patients. Infection may be transmitted by direct and indirect contacts with infected materials. Infection transmission occurs by direct or indirect contact with blood, saliva, fluids, aerosol containing droplets of infective agents and contaminated instruments and surfaces. 1

Health care providers are high risk of acquiring infection as they are constantly exposed to pathogens which can cause Hepatitis B, C and Aids. Other microorganisms involved in cross infection are *Varicella-zoster virus, Herpes virus, Pseudomonas, Legionella, Mycobacterium and Staphylococcus aureus*. All patients should be considered infectious and standard protocols should be followed for all patients. 1

Guidelines to regulate infection control policies and maintain safe environment in dental Operatories have been developed and released by competent authorities. 2 Implementation of these guide lines is important for safe environment.

There are several factors affecting compliance of infection control policies by dental healthcare providers. They are due to lack of knowledge 3,4 proper equipment like personal protective equipment 5,6 and professionalism.7 Improper training of health care workers leads to non implementation and monitoring of infection control policies, like health care workers do not wear personal protective equipment and do not disinfect surfaces.

There are a lot of variations amongst developing and developed countries as far as infection control policies are concerned. 6

The objective of this study was to investigate knowledge, attitude, and practices of personal protective equipment in private dental clinics, hospitals and colleges in Karachi. Studies have been conducted in other countries; in our country they are still limited.8, 9, 10

## **2. MATERIALS AND METHODS**

The cross sectional study was carried out over a period of three months in Karachi in 2018. Data collection was done on a precoded questionnaire. Dentists working in different places were randomly selected. Our colleagues went to different workplaces with letter about the study and got the printed questionnaires filled by dentists. . This was a Knowledge, Attitude, Perception (KAP) survey that's why the actual sample size was calculated at 50% prevalence. After adding 20% wastage total sample size was 450. The questionnaire was sent and the response rate was 50%, therefore, the actual sample size on which analysis was done was 251. Completely filled 251 questionnaires were received and included in the study. The dentists who participated in the study were categorized according to qualifications into three groups General dentists, Post graduate residents and Specialist group. Dentists registered with Pakistan Medical and dental council (PMDC) were included in the study. Dental students, Dental hygienists, Dental Technologists and Dentists not registered with PMDC were excluded from the study.

### **2.1 Statistical Analysis**

The author and dental team collected the data. Analysis of collected data collection was done using SPSS version 20. The data obtained from the different group of dentists was assessed using Chi square test.

### 3. RESULTS AND DISCUSSION

#### 3.1 RESULTS

Out of the total sample of 251 dentists, majority 186 (74%) of dentists belonged to general dentists group, followed by post graduate **trainees** 44 (19%) and **specialists** 21 (8%).

Majority of the dentists wearing gloves and masks during procedures were specialists followed by post graduate trainees and general dental practitioners. It was generally observed that less than 50% of dentists had a habit of changing mask after each patient. (Table I)

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| Table I: Practices of personal protective equipment among dental professionals |
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|  | Specialist<br>Yes<br>n (21) (%) | PGT<br>Yes<br>n (44) (%) | GDP<br>Yes<br>n (186) (%) | P value |
|--|---------------------------------|--------------------------|---------------------------|---------|
|--|---------------------------------|--------------------------|---------------------------|---------|

UNDER PEER REVIEW

|                                       |            |            |             |       |
|---------------------------------------|------------|------------|-------------|-------|
| Hand washing before wearing gloves    | 16 (76.2%) | 22 (50%)   | 92 (49.5%)  | 0.065 |
| Wear gloves while working on patients | 21 (100%)  | 43 (97.7%) | 182 (97.8%) | 0.791 |
| Change gloves between patients        | 21 (100%)  | 42 (95.5%) | 171 (91.9%) | 0.307 |
| Hand washing after removing gloves    | 21 (100%)  | 40 (90.9%) | 175 (94.1%) | 0.351 |
| Wear mask while working on patient    | 21 (100%)  | 44 (100%)  | 173 (93%)   | 0.091 |
| Change mask between patients          | 9 (42.9%)  | 18 (40.9%) | 93 (50%)    | 0.496 |

As far as wearing labcoat was concerned statistically significant (p value = 0.005) difference was found amongst the dentists, with General Dentists (88.2%) most compliant with wearing lab

coat. Hair cap was worn by less than 21% of dentists in all the groups. Eye wear was worn mostly by specialists (66.7%). (Table II)

Table II: Protective equipment during general procedures among dental professionals

Trend of wearing personal protective equipment during surgical procedures showed statistically

|  | Specialist<br>Yes<br>n (21) (%) | PGT<br>Yes<br>n (44) (%) | GDP<br>Yes<br>n (186) (%) | P value |
|--|---------------------------------|--------------------------|---------------------------|---------|
| Lab coat during<br>general<br>procedures | 13 (61.9%)                      | 38 (86.4%)               | 164 (88.2%)               | 0.005   |
| Eye Wear during<br>general<br>procedure  | 14 (66.7%)                      | 22 (50%)                 | 66 (35.5%)                | 0.008   |
| Hair cap during<br>general<br>procedure  | 3 (14.3%)                       | 5 (11.4%)                | 38 (20.4%)                | 0.332   |

significant difference (p value = < 0.005) amongst dentists, with specialists mostly wearing surgical gowns, eye wear and hair cap during surgical procedures.

There was statistically significant (p value = 0.05) amongst dentists as far as vaccination against Hepatitis B was concerned. Mostly specialists and post graduate trainees were vaccinated against Hepatitis B.

### 3.2 DISCUSSION



This study was conducted to assess the knowledge and practice of infection control policies in Karachi. Dentistry is still a developing field in Pakistan as compared to medical profession. That's why number of specialists is low and in our study we had a higher number of general dentists followed by post graduate trainees and specialists. The infection control guidelines laid down by centre of disease control are supposed to be followed by all dentists working in Karachi. This study did not focus on all issues related to infection control but focused on most common category of infection control that is hand hygiene and wear of personal protective equipment during procedures. In this study self reported information was collected and analysed therefore there could be an overestimation of correct infection control knowledge and practice.

Infection control protocols should be followed for all patients. Proper implementation of infection control protocols prevents spread of infection. In our study, like other studies, 8, 11, 12 we observed that most of the dentists had a habit of washing hands, wearing gloves and masks but glasses, gowns and caps were not worn by most of the dentist. It was noted if hands were washed before and after treatment and an antibacterial hand wash was used for proper washing according to World Health Organization guidelines. Dentists had a habit of wearing masks but most of them did not change mask after each patient.

During procedures running hand pieces create mist and saliva and blood can splatter. Saliva being transparent cannot be seen therefore dentists protect themselves by wearing personal protective equipment especially during surgical procedures observed in our and other studies as well.12,13

Most of the dentists did not have habit of surface disinfection, although surfaces get contaminated during procedures and should be disinfected after each patient. In general, it was observed that dentist's infection control protocols varied like other studies 12, 14, 15, 16 with specialists more conscious of protocols and wearing personal protective Equipment.

In our study as compared to other studies we found higher number of dentists vaccinated against Hepatitis B virus. 8, 10, 11, 15.

Variation in wearing personal protective equipment was observed. This could be attributed to adequate basic infection control programs in dental schools but subsequent lack of constant reinforcement through continuing education courses and regularly updated recommendations circulated through dental schools, dental associations, and governmental agencies. Dentists need to make a conscious effort to prevent spread of diseases by following the protocols laid down by Centre of disease control (CDC).<sup>15</sup>

Studies conducted 3,7, 8, 10,12,16,17,18,19,20,21,22,23,24 have shown that dentists and the dental staff in underdeveloped, developing and developed countries are inclined towards wearing personal protective equipment. It is important to keep on assessing the knowledge and practice of dentists.

#### **4. CONCLUSION**

Dentists working in different work places showed great variation in wearing personal protective equipment during dental procedures. This highlights the inappropriate knowledge, attitude, and practice of wearing personal protective equipment during dental procedures.

#### **RECOMMENDATIONS**

The author would like to give the following recommendations on the basis of the results obtained from the study.

- Development and distribution of infection control manuals.
- Development of continuing dental education programs regarding Infection control for dental surgeons and staff.
- Implementation of Infection control protocols should be regularly checked by competent authorities.
- There is a need to survey the dental practices in Pakistan on national level.

#### **CONSENT**

A written consent was obtained from the doctors for publication of this study.

#### **ETHICAL APPROVAL**

The author hereby declares that ethical approval was obtained from appropriate ethics committee and has therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki for the study.

### References:

1. Laheij A. M. G. A., Kistler J. O., Belibasakis G. N., Välimaa H., de Soet J. J. Healthcare-associated viral and bacterial infections in dentistry. *J Oral Microbiol.* 2012;4
2. Saccucci M et al. How to manage the biological risk in a dental clinic: current and future perspectives. *Minerva Stomatol.* 2017 Oct; 66(5):232-239.
- 3 Tada A., Watanabe M., Senpuku H. Factors influencing compliance with infection control practice in Japanese dentists. *Int J of Occup Environ Med.* 2014;5:24–31.
4. Ebrahimi M., Ajami B. M., Rezaeian A. Longer years of practice and higher education levels promote infection control in Iranian dental practitioners. *Iran Red Crescent Med J.* 2012;14:422–429.
5. Puttaiah R., Miller K., Bedi R., et al. Comparison of knowledge, attitudes and practice of dental safety from eight countries at the turn of the Century. *J Contemp Dent Pract.* 2011; 12(1):1–7.

6. Oosthuysen J., Potgieter E., Fossey A. Compliance with infection prevention and control in oral health-care facilities: a global perspective. *Int Dent J.* 2014;64(6):297–311.
7. Cheng H. C., Su C. Y., Huang C. F., Chuang C. Y. Changes in compliance with recommended infection control practices and affecting factors among dentists in Taiwan. *J Dent Educ.* 2012;76:1684–90.
8. Khan AA, Javed O, Khan M, Mehboob B, Baig S. Cross Infection Control. *Pak Oral & Dental J* 2012;32:31-35.
9. Butt AK, Khan AA, Khan SY and Ijaz S. Dentistry as a possible route of hepatitis C transmission in Pakistan. *Int dental J.* 2003; 53: 141-44.
10. Puttaiah R, Bedi R, Almas K. A survey of infection control practices among general Dental Practitioners in Lahore, Pakistan. *J Pak Dent Assoc* 2001;10:71-6.
11. Gupta S, Rani S, Garg S. Infection control knowledge and practice: A cross-sectional survey on dentallaboratories in dental institutes of North India. *J Indian Prosthodont Soc.* 2017 Oct-Dec;17(4):348-354.

12. Pataya R, et al. Comparison of knowledge, attitudes and practice of dental safety from eight countries at the turn of the century. *J Contemporary Dent Prac* 2011;12:1-7.
13. Bârlean L, Dănilă I, Balcoş C, Săveanu I, Balan A. Preventive attitudes towards infection transmission in dental offices in North-East Romania. *Rev Med Chir Soc Med Nat Iasi* 2012;116:1209-12.
14. AL Negrish A., Al Momani A. S., AL Sharafat F. Compliance of Jordanian dentists with infection control strategies. *Inter Dent J.* 2008; 58(5):231–6.
15. Dagher J, Sfeir C, Abdallah A, Majzoub Z. Infection Control Measures in Private Dental Clinics in Lebanon. *Int J Dent.* 2017; 2017.
16. Al Shatrat S. M., Shuman D., Darby M. L., Jeng H. A. Jordanian dentists' knowledge and implementation of eco-friendly dental office strategies. *Int Dent J.* 2013;63(3):161–8.
17. Halboub E. S., Al-Maweri S. A., Al-Jamaei A. A., Tarakji B., Al-Soneidar W. A. Knowledge, attitudes, and practice of infection control among dental students at Sana'a University, Yemen. *J Inter Oral Health.* 2015;7:15–9

18. Alduais A. M., Mogali S. G. Assessment of infection control in dental clinics at Ibb City, Republic of Yemen: dentist's perspective. *J Public Health*. 2015;3:423–432.
19. Ahmad I. A., Rehan E. A., Pani S. C. Compliance of Saudi dental students with infection control guidelines. *Inter Dent J*. 2013; 63(4):196–201.
20. Barghout N., Al Habashneh R., Ryalat S. T., Asa'ad F. A., Marashdeh M. Patients' perception of cross-infection prevention in dentistry in Jordan. *Oral Health Prev Dent*. 2012; 10(1):9–16.
21. Rahman B., Abraham S. B., Alsalami A. M., Alkhaja F. E., Najem S. I. Attitudes and practices of infection control among senior dental students at college of dentistry, University of Sharjah in the United Arab Emirates. *Eur J Dent*. 2013;7(5):S15–S19.
22. Singh B. P., Khan S. A., Agrawal N., Siddharth R., Kumar L. Current biomedical waste management practices and cross-infection control procedures of dentists in India. *InterDent J*. 2012; 62(3):111–6.
23. Vega O. G., Janus C., Laskin D. M. Hand-washing knowledge and practices among dentists and dental specialists. *Quintessence Inter*. 2012; 43: 429–434.