Knowledge, attitude, and practice of hand hygiene among dentists practicing in Bangalore city – A cross-sectional survey

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Abstract

Background: Hand hygiene in dental practice is one of the most important parts of the infection control process to reduce the risk of transmitting microorganisms from provider to patient. The Centers for Disease Control and Prevention (CDC) Hand Hygiene (HH) guidelines were published more than 5 years ago. The extent to which dental practitioners are aware of it and the extent to which alcohol-based hand sanitizers are used by dental practitioners are unknown. Aims and Objectives: The aim of the present study was to assess the practice of HH among dentists in Bangalore city. The objectives of the study were to assess knowledge and attitudes among dentists with regard to HH in Bangalore city. Materials and Methods: A total of 204 dentists from the registry of dental care facility, Bangalore, were selected for this study. The data were collected by administering a specially designed proforma. Results: 51% of the dental practitioners use soap and water for HH frequently and 44.6% use alcohol-based hand sanitizers for HH frequently. Also, 53.4% were aware of the CDC HH guideline. One-third of the dental practitioners indicated that they have limited/moderate knowledge of the CDC HH guideline. Conclusion: Most dental practitioners use soap and water for HH frequently, and a smaller number of dental practitioners use alcohol-based hand sanitizers for HH frequently. The knowledge of the CDC HH guidelines needs to be improved.

Key words: Dentists, hand washing, infection control

INTRODUCTION

For more than a century, health care providers’ hands have been recognized as major reservoirs of pathogens that may cause clinical infections.[¹] Healthcare-associated infections are an important cause of morbidity and mortality among hospitalized patients worldwide.[²] Hand hygiene (HH) is the primary measure to reduce infections. It is a simple action, but the lack of compliance among healthcare providers worldwide is problematic. On the basis of research into the aspects influencing HH compliance and the best promotional strategies, new approaches have proven effective.[³] In 1988 and 1995, guidelines for hand washing and hand antisepsis were published by the Association of Professionals in Infection Control (APIC). Recommended indications for hand washing were similar to those listed in the Centers for Disease Control and Prevention (CDC) guidelines.

Currently, CDC infection prevention and control guidelines have been developed through a careful, rigorous, evidence-based process overseen by the
The guideline for HH in healthcare settings provides the healthcare workers (HCWs) with a review of data regarding hand washing and hand antisepsis in healthcare settings. In addition, it provides specific recommendations to promote improved HH practices and reduce the transmission of pathogenic microorganisms to patients and personnel in healthcare settings. In central Europe, alcohol-based hand rubs are the first choice because they have been found to achieve a better antimicrobial activity compared to detergent-based antiseptics. In contrast, hand washing with medicated soap is practiced most frequently in the United States. HCWs often attribute the failure to comply with hand washing to the limited time available for this practice. This study was to take up to assess the knowledge, attitudes, and practices of HH among the dentists practicing in Bangalore city.

MATERIALS AND METHODS

A cross-sectional survey was carried out among practicing dentists in Bangalore. Data were collected by conducting a survey of active dental practitioners in Bangalore city. Random sample (N = 204) was drawn from a list of dental practitioners from the registry of dental care facilities (including multispecialty clinics, single specialty clinics, and corporate hospitals). The study sample was selected according to Karnataka Private Medical Establishment (KPME) Act. The total number of active registered dental practitioners in Bangalore city was 1100. Random sample size estimated was 204 (N). From the sample, we excluded subjects who were ill, deceased, or retired from practice. Subjects who do not self-identify their primary professional activity as the practice of dentistry and themselves as Dental Practitioner.

Ethical clearance was obtained from the ethical committee of The Oxford Dental College, Hospital and Research Centre, Bangalore.

An informed consent was obtained from the participants. Through personal interview, the respondents were informed about the aim of the study as well as the fact that participation in the questionnaire survey was totally voluntary and anonymous.

Details of the dental practitioners were recorded: These included age, gender, and number of years of practice.

Questions related to assess the knowledge, attitudes, and practices among dentists were included. Using a three-page closed-ended questionnaire, we asked subjects to describe the basic characteristics of their practice settings, their HH practices, the HH products they use, their attitudes toward HH practices, and their adherence to HH guidelines. We also asked subjects to assess their knowledge in this area. Subjects rated their attitudes by using a four-point Likert scale, in which 1 was equated with "strongly agree" and 4 with "strongly disagree."

The questionnaire was in English; its respective psychometric properties (validity and reliability) were assessed. Content validity was assessed by a panel of eight experts consisting of staff members of the Department of Public Health Dentistry, The Oxford Dental College, Hospital and Research Centre, Bangalore. The purpose was to depict those items with a high degree of agreement among experts. Aiken’s V was used to quantify concordance between experts for each item; values higher than 0.92 were always obtained.

Before commencing the study, a pilot study was performed to check the internal consistency of the questionnaire. The results thus obtained were subjected to statistical analysis. Cronbach’s alpha value of 0.82 showed good internal consistency of the questionnaire.

All the data were entered into a database on Microsoft Excel. Microsoft Word and Excel have been used to generate the tables and graphs. Statistical analysis was done using SPSS software version 16.

RESULTS

In the present study, 58.3% were male practitioners and 41.7% were female practitioners. 25.5% practitioners had 1-2 of years practice, 24.5% had 3-5 years, 33.3% had 6-10 years, and 16.7% had >10 years of practice. Number of patients seen per week by the dental practitioners was: 1-10 (3.9%), 11-20 (41.2%), 21-30 (30.9%), 31-40 (15.2%), 41-50 (6.4%), and > 50 (2.5%).

Table 1 shows the distribution of the study population based on knowledge about HH. The study group was categorized based on whether they believed that there was an association between HH and infection control; 195 (95.6%) said yes and 9 (4.4%) said no. When the respondents were questioned about whether HH prevents the spread of infection to patients, 151 (74%) strongly agreed and 5 (2.5%) strongly disagreed with it. When the respondents were questioned about the awareness of the CDC HH Guidelines, 109 (53.4%) were aware and 95 (46.6%) were not aware of them.

Table 1: Distribution of the study population based on knowledge about HH.
When the respondents were questioned about whether they had an easy access to information regarding CDC HH Guide, 83 (40.7%) said yes and 121 (59.3%) said no.

Table 2 shows the distribution of the study population based on their attitude about HH. When the respondents were questioned about whether HH products are detrimental to their skin, 34 (16.7%) strongly agreed and 88 (43.1%) strongly disagreed with it. When the respondents were questioned whether following the CDC HH Guideline recommendations was adversely going to affect the skin of their hands, 35 (17.2%) replied yes. When the respondents were questioned about whether they were comfortable with their HH practices, regardless of what the CDC Guidelines recommended, 32 (15.7%) were comfortable. When the respondents were questioned about whether they thought patients preferred to see them washing hands with soap and water.

Table 3 shows the distribution of the study population based on their practice of HH. When the respondents were questioned about what they used to wash their hands, 15 (7.4%) said they use plain soap, 90 (44.1%) use antiseptic soap, 99 (48.5%) use antiseptic solution. The study group was asked how often they used soap for HH; 74 (87.1%) said they use it at the start of the day, 77 (90.6%) mentioned they use it between the patients, and 80 (94.1%) mentioned they use it after removing gloves. The study group was asked about the duration of their hand washing with soap and water before examining the patient; 59 (29%) replied they do not wash their hands, 44 (20%) said they wash hands for 5-10 s, and 101 (49%) said that they wash hands for more than 15 s. When asked about the duration of hand washing after examining the patients, 2 (1%) participants said they do not wash their hands, 89 (43.6%) said they wash hands for 5–10 s, and 113 (55.4%) said they wash hands for 5–10 s. The study group was asked how often they used alcohol-based hand sanitizer; 49 (57.6%) mentioned they do not use it, 27 (31.8%) said they use it.
it at the start of practice day; 30 (35.3%) said they use it after removing gloves, and 21 (24.7%) mentioned that they use it when patient care is interrupted.

**DISCUSSION**

Dentistry has a responsibility to adhere to scientifically accepted and evidence-based principles of infection control. In Bangalore, the profession includes approximately 1100 registered dentists. In 2002, the CDC published guidelines for HH in healthcare settings. In 2003, the CDC released guidelines for infection control in dental healthcare settings. Although the CDC dental infection control guidelines were published first, the CDC dental infection control guidelines are distributed more widely in dentistry. Both these documents have implications for oral healthcare providers’ HH practices. The dental infection control guidelines include a list of areas of concern that were not addressed in previous recommendations for dentistry, including HH products and surgical hand asepsis. Although the dental infection control guidelines are scientifically based on the CDC HH guidelines, the recommendations are somewhat different.\[1\]

For example, the CDC HH guidelines encourage the use of alcohol-based hand sanitizers. The dental infection control guidelines, however, place no emphasis on the use of alcohol-based products more than on the use of soap and water. In fact, using alcohol-based products is presented as an alternative method.

The two major hand antiseptics in use today are alcoholic rubs and medicated soaps or foams containing chlorhexidine. Alcohols have the most rapid antimicrobial effect and are, in contrast to chlorhexidine, equally effective against gram-positive and gram-negative microorganisms. The antimicrobial activity of alcohols can be attributed to their ability to denature proteins. Alcohol solutions containing 60–95% alcohol are most effective, and higher concentrations are less potent. A disadvantage of pure alcohol is its drying effect on the skin and the absence of a residual antimicrobial activity. Gels containing an increased glycerine concentration and 70% (v/v) ethanol are preferred. These problems are resolved in modern alcoholic hand disinfection (AHD) containing different alcohols, additional antimicrobial compounds with residual activity, and refastening agents. However, the choice of AHD may be important; some AHD agents (especially liquids) take longer to be rubbed onto the skin and may be felt to leave a slimy residue. Only two clinical studies have been designed to evaluate the clinical effect of different hand antiseptics. The results, which favored chlorhexidine, were based on the observed nosocomial infection rates.\[6,7\] It is possible and even probable that most dental healthcare personnel are more familiar with or only familiar with the dental infection control guidelines. In some instances, people who say they have limited/moderate knowledge of the CDC HH guidelines may believe that they have good/excellent knowledge of the dental infection control guidelines.

HH in dental practice is one of the most important parts of the infection control process and is the single most important activity performed to reduce the risk of transmitting microorganisms from provider to patient. Microflora that inhabits the skin can be classified as transient or resident. Transient microflora colonizes the superficial layers of the skin and can be removed easily during routine hand washing. It also is the type of microflora that is transmitted most often when providing care directly to patients and is associated most frequently with healthcare-associated infections. Resident microflora is adherent and associated with the deeper layers of the skin, is most resistant to removal with HH, and is less likely to be associated with healthcare-associated infections. The selection of HH methods depends on factors such as the type of procedure to be performed, the persistence of decontamination, and the potential risk of spreading infection. Gloves, which often are thought to be a completely effective barrier that protects healthcare providers and prevent the spread of microorganisms, have microscopic imperfections. Hence, gloves can give providers a false sense of security. According to the CDC, the use of gloves reduces the risk of contamination by 70–80%, helps prevent cross-contamination, and helps protect patients and providers. Although wearing gloves offers a means of protection, it also creates a warm, moist environment in which organisms can proliferate.

This situation results in a large increase in the amount of transient microflora. So, HH is essential to eliminate transient microflora and decrease resident microflora, even when gloves are worn. Data show that 51% of dental practitioners use soap and water for HH frequently and 44.6% use alcohol-based hand sanitizers for HH frequently. In addition, approximately one-third of the dental practitioners indicate that they have limited/moderate knowledge of the CDC HH guidelines.

In a study by Myers et al., 56 of the 234 subjects (24%) reported using alcohol-based hand sanitizers in their primary practice setting. Antimicrobial soap was the most commonly used product in the practice setting, with 202 of 234 subjects (86%) using it. In total, 210 of 234 subjects who responded (90%) used either antimicrobial soap or alcohol-based hand sanitizers in their primary practice settings.\[1\]
In this study, self-reported reasons for frequent lack of compliance included the following: Hand washing agents cause skin irritation and dryness; lack of soap or too busy/hand washing takes too long; wearing of gloves; hands do not look dirty; and a perceived low risk of acquiring infection from patients. In contrast, most dentists in the current study reported that they were not too busy for HH, and that adequate hygiene with traditional hand washing requires a considerable amount of time and does not provide as rapid and effective bactericidal activity as does an alcohol-based hand sanitizer.[8] Hand washing with plain soap can only remove loosely adherent transient flora. Hand washing with plain soap and water for 15 s reduces the bacterial counts on the skin by 0.6–1.1 log10, whereas washing for 30 s reduces the count by 1.2–2.8 log10. Hand washing with plain soap fails to remove pathogens from the hands of hospital personnel.[9] The use of alcohol-based hand sanitizers, however, was not emphasized in the dental infection control guidelines, which may account, in part, for their low usage among dental practitioners. Also, 36% of subjects in the study stated that they agreed or strongly agreed that they were comfortable with their current HH practices, regardless of the guidelines. Overall, the findings indicate that dental practitioners have generally positive attitudes toward HH, that ways to improve HH practices of a relatively small group of practitioners need to be found, and that their knowledge about the CDC HH guidelines needs to be improved. Few studies have been conducted to assess the costs of guideline development and implementation, and some practice guidelines have been implemented without concomitant assessment of patient outcomes and the costs and benefits of changes in care.[9] Majority of the general dental procedures such as conducting oral examinations and placing restorations and surgical procedures with a low risk of causing infectious transmission. Critical surgical procedures that routinely penetrate a normally sterile site require the elimination of the transient microflora and a reduction in the resident microflora because these procedures carry a much higher risk of transmitting infectious bacteria. The clinician can accomplish this surgical antisepsis before donning sterile gloves by using soap and water followed by an alcohol-based hand sanitizer with persistent activity or by using antimicrobial soap and water. Study limitations are the data presented here are restricted only to selected number of dentists and HH practices among the healthcare professionals vary geographically.

CONCLUSION

Our results show that it is important to standardize guidelines for dental practitioners to increase their knowledge, as well as to create a practical guide to improve the HH process and guideline compliance. Furthermore, education of the dental community is warranted to improve HH compliance, the efficacy of HH practices, and skin health. In-service education, information leaflets, workshops and lecture, automated dispensers, and performance feedback on HH adherence rates need to be improved further. Hand washing should be encouraged whenever a healthcare provider is in doubt about the necessity for doing so. Hand washing should be encouraged between patient/resident/client contacts; it may be indicated more than once in the care of one person, for example, after touching secretions and before going on to another care activity for the same person.[9]

REFERENCES

1. Myers R, Larson E, Cheng B, Schwartz A, Da Silva K, Kunzel C. Hand hygiene among general practice dentists: A survey of knowledge, attitudes and practices. J Am Dent Assoc 2008;139:948-57.
2. Mani A, Shubang AM, Saini R. Hand hygiene among health care workers. Indian J Dent Res 2010;21:115-8.
3. World Health Organization. WHO Guidelines on Hand Hygiene in Health Care: A Summary. Geneva: World Health Organization; 2009. p. 1-5.
4. Larson E. Status of practice guidelines in the United States: CDC guidelines as an example. Prev Med 2003;36:519-24.
5. Boyce JM, Pittet D. Guideline for Hand Hygiene in Health-Care Settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America. MMWR Recomm Rep 2002;51:1-45, quiz CE1-4.
6. Houben E, De Paepke K, Rogiers V. Skin condition associated with intensive use of alcoholic gels for hand disinfection: A combination of biophysical and sensory data. Contact Dermatitis 2006;54:261-7.
7. Voss A, Widmer AF. No time for hand washing? Hand washing versus alcoholic rub: Can we afford 100% compliance? Infect Control Hosp Epidemiol 1997;18:205-8.
8. Larson E. A tool to assess barriers to adherence to hand hygiene guideline. Am J Infect Control 2004;32:48-51.
9. Ehrenkranz NJ, Alfonso BC. Failure of bland soap handwash to prevent hand transfer of patient bacteria to urethral catheters. Infect Control Hosp Epidemiol 1991;12:654-62.

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