Hand hygiene knowledge and practice among dentists in Mansoura Faculty of Dentistry, Egypt

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ABSTRACT

Objective: This study was carried out to assess knowledge and practice towards infection control measures in particular hand hygiene among dentists in Mansoura Faculty of Dentistry and to investigate associated factors with better knowledge and practice.
Methods: Cross sectional study was conducted on 115 dentists in Mansoura Faculty of dentistry. An anonymous 36 item self-administered English questionnaire was used. It included personal data, workplace hygiene measures, perceived knowledge benefits, hand hygiene practice and complete hepatitis B vaccination.
Results: Over a quarter (27%) of the respondents wash their hands before wearing gloves and 72.2% wash their hands when they are visibly soiled. Two thirds (69.6%) washed their hands when the worn gloves became torn. The majority strongly knew that hand washing helps to prevent transmission of infection to patients (94%), health workers (94%) and health workers' family members (99.5%). The main barriers to regular hand hygiene were lack of time and inadequate facilities. Lack of institution monitoring for hand hygiene was (63.5%). Hepatitis B vaccination coverage was (60%). Wearing protective eye wear was more frequently found among master degree dentists than general practitioners ($p<0.05$).
Conclusion: This study revealed good hand washing practices and high knowledge. However, poor monitoring of hand hygiene in teaching institutions and HB vaccination coverage was noticed.

KEY WORDS: Hand hygiene
Workplace hygiene
Public health dentistry
Infection control

Introduction

Hand hygiene is the most critical measure for prevention of transmitting infections to both patients and health care workers [1]. It can prevent up to 80% of hand carried infections [2]. Non-compliance with hand hygiene practices is associated with health related infections, the spread of multi-resistant organisms, and has been a major contributor to the outbreak of infectious diseases [3]. Hand hygiene is very important among dentists because they are at risk of contamination by blood and body fluids more frequently. Dentist's hands can become contaminated by touching body secretions, wounds and excretions of patients. To avoid prolonged hand contamination, it is important to practice good hygienic habits [4]. Several studies on hand hygiene have been conducted on health workers including dental professionals in different countries all over the world [5]. A lot of these studies declared that hand hygiene practice among health care providers is low despite the fact that it is one of the simplest aspects of infection control [6]. Previous research has considered hand hygiene knowledge and practice in general with no consideration for possible associated factors intrinsic to dentist work practice as scientific degree or duration of work [3]. To the best of our knowledge, information regarding compliance with infection control precautions in the dental settings in Egypt is limited. This study was carried out to assess knowledge and practice towards infection control measures in particular hand hygiene among dentists in Mansoura Faculty of Dentistry and to investigate associated factors with better knowledge and practice.

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Materials and methods

Study Design

A cross sectional study was conducted from January to June 2014 at Faculty of Dentistry, Mansoura University.

Study subjects

A convenient sample of 115 dentists out of 160 with response rate of 71.8%. The study subjects were dentistry staff (lecturers, assistant lecturers and demonstrators) (n=68), post-graduate dental students (n=30) and other dental specialists non staff members (n=17). The dental staff are engaged in teaching and supervising undergraduate students hand in hand with patient treatment and execution of practical part of their thesis. Non staff members are specialists and consultants in different departments and handling mainly patient treatments in out-patient clinics.

Study setting

The study was conducted in out-patient dental clinics of seven clinical departments (Mansoura Faculty of dentistry).

Study methods

Anonymous 36 items self-administered questionnaire in English was used. It included personal data such as age, gender, job title, year of graduation, job description, degree and duration of work. In addition to eight items for workplace hygienic measures (e.g wearing protective gloves and eye wear, changing gloves in between patients, wearing jewelry and disposal of contaminated gloves before handling non clinical items and complet hepatitis B vaccination) quoted from Qudeimat et al [7]. Eight items for hand washing practice (e.g before and after gloving ,after torn gloves, before leaving operatory) four items perceived benefits of hand washing, six items for barriers (e.g lack of facilities and lack of time) to regular hand washing quoted from Omogbai et al., [3]. Also, collection of data related to opinion about need for more information on hand hygiene measures was obtained. Total score for hand washing practice was estimated based on three responses for 8 items (never=1/sometimes=2/always=3) (total=24/min=8 /max=24) and 3 items for knowledge as two responses (yes=1 or no=0) (total=3/min=0/max=3). Mean score was considered as cutoff value for studied group. Whenever, the total score was less than mean, it was considered as poor Knowledge and practice. When the total score was more than or equal to mean it was considered as good knowledge and practice. Finally, one item was included to identify the most preferred sources of information for hand hygiene.

Ethical consideration

Returning the filled questionnaire was considered as implicit consent with no need for signing a written consent. Ethical approval for the study is required from the Faculty of Medicine- Mansoura University Institutional Review Board (IRB) before publication. The paper has already been submitted online and received replies.

Statistical Analysis

Data were analyzed with SPSS version (16.0). Descriptive statistics as number and percent were calculated to summarize qualitative data. Continuous variables were summarized by mean and standard deviation for parametric data. Median, minimum and maximum were used for non-parametric continuous data. Independent t test was used to compare between the two means. Mann-whiney test was used to compare non parametric continuous variables. The categorical variables were compared with Chi-square ($\chi 2$) test. Fisher's exact test was used when 50% of cells or more were less than 5; $p \leq 0.05$ was considered as statistically significant.

Results

The mean age of studied subjects was 28.6±8.1. The ratio of males to females is nearly 1:1. Nearly 60% worked for less than five years. The dentist staff members comprised of 59.1% of studied dentists. Post graduate students & other specialists were 26.1%, 14.8% respectively (Results not included). Frequency of hand washing before gloving (27%) was lower than that after gloving (73.9%) and tearing gloves (69.6%) among studied dentists. The most frequent hand hygiene practice was before taking lunch (89.6%) Table (1).

Table 1. Hand washing practice among studied dentists.

Hand washing Practice	Study Subjects n=115		
	Never	Sometimes	Always
	No (%)	No (%)	No (%)
Before gloving	32 (27.8)	52 (45.2)	31 (27.0)
After gloving	3 (2.6)	27 (23.5)	85 (73.9)
Torn gloves	5 (4.3)	30 (26.1)	80 (69.6)
Before leaving operatory	9 (7.83)	38 (33.04)	68 (59.13)
Contaminated hands	4 (3.5)	15 (13.0)	96 (83.5)
Visibly soiled hands	9 (7.8)	23 (20.0)	83 (72.2)
Before lunch	1 (0.9)	11 (9.6)	103 (89.5)
After using restrooms	2 (1.7)	14 (12.2)	99 (86.1)
Total score Mean± SD Minimum -Maximum		21.00± 2.5 8 – 24	

It was found that lack of knowledge regarding hand hygiene prevents the spread of infection to patients, Health Care Workers (HCWs) and family of HCWs were (6%,6%,0.86%; respectively) among studied dentists Table (2).

Table 2. Knowledge of benefits of hand hygiene among studied dentists.

Knowledge items	Study Subjects n=115	
	Yes No (%)	No No (%)
Hand hygiene prevent spread of infection to patients	108 (94)	7 (6)
Hand hygiene prevent spread of infection to family of health worker	114 (99.14)	1 (0.86)
Hand hygiene prevent spread of infection to health worker	108 (94)	7 (6)
Total score Mean± SD	2.8± 0.38	
Minimum –maximum	0-3	

About two thirds of the sample (63.5%) reported that their current institution didn't monitor hand hygiene practice. More than one third 26.9% reported having no drying methods at all. More than half (57.4%) needed more information about hand hygiene. The most preferred sources of information were internet and books /pamphlets (41.7%, 33.04%; respectively) Table (3). Older age and longer duration of work was associated with better knowledge and practice scores. Better knowledge scores was noticed (≥2.8) in master degree dentists compared to general practitioners. However, there were no statistically significant differences (p>0.05) between the different groups in in knowledge and practice as regards age, duration of current job or scientific degree Table (4). Dental professionals with master degree were more likely to use protective eye wear with statistically significant difference (p<0.05).

Table 3. Association between demographic & work profile factors with knowledge score and practice scores.

	Knowledge score		P Value	Practice score		P value
	<2.8 Poor N=13	≥2.8 Good N=102		<20.00 Poor N=38	≥21.0 N=77	
Age mean± SD	26.08±3.6	29.0±8.5	0.2	27.6 ±7.8	29.16 ±8.3	0.3
Gender Male female	9 (69.2) 4 (30.8)	46 (45.1) 56 (54.9)	0.1	22 (57.9) 16 (42.1)	33 (42.9) 44 (57.1)	0.12
Duration of current job Median Minimum-Maximum)	2 0-12	2.5 0-36	0.6	2 0-35	3 0-36	0.3
Job title Non staff member Staff member	4 (30.8) 9 (69.2)	38 (37.3) 64 (62.7)	0.6	23 (60.5) 15 (39.5)	45 (58.4) 32 (41.6)	0.8
Scientific degree GP Master degree	10 (76.9) 3 (23.1)	53 (52.0) 49 (48.0)	0.08	20 (52.6) 18 (47.4)	43 (55.8) 34 (44.2)	0.7

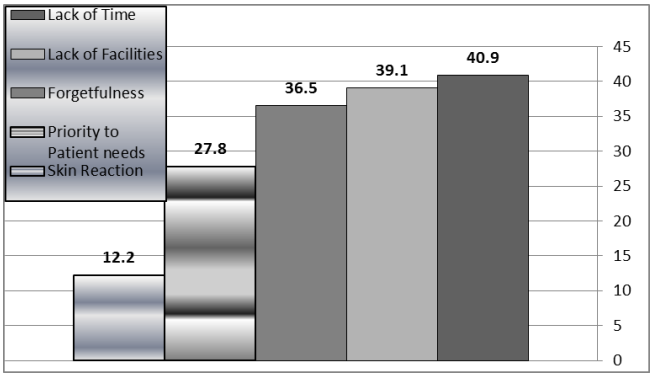
However, GPs had more frequent wearing of masks, changing gloves in between patients and before handling non clinical items with no statistically significant difference (p>0.05). Moreover, complete hepatitis B vaccination was more commonly found among GP group than higher degree professionals with no statistically signify cant difference (p>0.05) Table (5).

The most commonly reported barrier to hand hygiene was lack of time (40.9%) followed by lack of facilities (39.1%), forgetfulness (36.5%) and priority of patient needs (27.8%). Skin reaction was the least common (12.2%) Figure (1).

Table 4. Workplace personal protective measures and specific preventive measure according to professional degree.

	Total n=115	*Dental professional*		
		GP n=63	*Master &higher degree n=52*	*p value*
		No (%)	**No (%)**	
Changing gloves in between patients				
Never or sometimes	5 (4.3)	5 (100)	0 (0)	Fisher's Exact test *0.06*
Always	110 (95.7)	58 (52.7)	52 (47.3)	
Wearing mask				
Never or sometimes	38 (33)	18 (47.4)	20 (52.6)	
Always	77(67)	45 (58.4)	32 (41.6)	*0.2*
Protective eye wear				
Never or sometimes	91 (79.1)	55 (60.4)	36 (39.6)	*0.01**
Always	24 (20.9)	8 (33.3)	16 (66.7)	
Eating or drinking in clinic				
Never or sometimes	109 (94.8)	60 (55)	49 (45)	
Always	6 (5.2)	3 (50)	3 (50)	*0.6*
Wearing jewelry				Fisher's Exact test *0.4*
Never or sometimes	110 (95.7)	61 (57)	49 (43)	
Always	5 (4.3)	2 (25)	3 (75)	
Disposing gloves before handling non clinical items				
Never or sometimes	23 (20)	13 (56.5)	10 (43.5)	
Always	92 (80)	50 (54.3)	42 (45.6)	*0.8*
Hepatitis B vaccination				*0.2*
Never	46 (40)	22 (47.8)	24 (52.2)	
Yes	69 (60)	41 (59.4)	28 (40.6)	

Figure 1. Barriers to Hand Hygiene among studied Dentists.



Discussion

Hand washing is the single most effective way to reduce the spread of a lot of infections in dentistry [8]. In the current study, the majority of our respondents (>90%) knew that hand washing plays an important role in infection control. This is matched with Omogbai et al., and Naik et al., who reported that most of the respondents had high knowledge regarding benefits of hand hygiene. These high percentages are encouraging and it may imply that most of dentists are willing to carry out hand hygiene in their practice [3,9].

Wearing jewellery makes dentists unable to achieve optimal hand hygiene due to the difficulty of gloving and the high rate of glove tear, resulting in contamination of the skin around the ring area [10]. Fortunately, in this study only 4.3% always wore jewelry during their work. In contrast, a higher percentage was found by Omogbai et al., who reported that 15.2% of respondents wear rings at work [3]. Moreover, improper glove use contributes to the spread of organisms and increases caregiver risk by the possibility of glove leakage [11]. Most of our respondents (95.7%) changed gloves in between patients. This came in agreement with Qudeimat eta l., who found that most of the dentists (70%) changed gloves between patients [7]. These rates were higher than that found in other remote studies in which only 12% to 54% of the dentists changed gloves between patients [12, 13]. As suggested in the infection control guidelines of the American Dental Association, dentists and dental assistants should always wear face masks and eye glasses with lateral protective shields [14].

In dental clinics, several infectious agents could be acquired by both dentists and patients by airborne transmission. Expected higher levels of oral microorganisms are produced during particular dental procedures, especially during mechanical scaling and cavity preparation [15]. In the current study, about two thirds (67%) were wearing masks during their work. These results were close to McCarthy et al., and Naidoo and Chikte., who reported that 75% to 100% of dentists routinely use masks[16,17]. However, the results of Qudeimat et al., Hudson et al., and Scully et al., studies showed poor compliance with the routine wearing of masks among dental staff [7,13,18].

In current research, one third (20.9%) of dentists used to wear eye protective equipment. However, other studies reported that 35% to 62% of the dentists wore eye protection [13,18]. In addition, Qudeimat et al (2006) [7] reported that 33% of dental staff always wore protective eyewear, and 14% never wore them. A possible reason for

poor compliance to wearing eye protective equipment is that they are not supplied by faculty resources and they are used according to the variation of personal preference.

Hepatitis B virus (HBV) infection is a major public health problem in the Middle East. Immunization of hepatitis B before admitting any job in dentistry remains the most efficient and effective way to protect against hepatitis transmission [8]. Hepatitis B vaccination coverage was 60% among different categories of dentists in current research. In contradiction, Hudson et al., and McCarthy et al., reported that the range of vaccination was 93% to 100% among dentists [16,18]. Also, Qudeimat et al., found 95% of dental staff members received HBV vaccination [7]. This reflects an improper implementation for obligatory hepatitis B vaccinations prior to start of practice at Mansoura Faculty of Dentistry. Hand washing is a very important indicator of safety and quality of health services because there is substantial evidence that demonstrate the correlation between good hand hygiene practices and low health care associated infection rates and substantially reduces the number of microbes that may be shared between patients and health care providers [19]. It was found that most of respondents wash their hands before gloving (27%) less frequently than after gloving (73.9%), after torn gloves (69.6%), contaminated hands (83.5%), before lunch (89.6%) and after using the rest room (86.1%). It may reflect adequate personal hygiene. Most of responders used available liquid hand soap and water for washing in clinics. After dealing with HBV or HCV positive patients, dentists used special antiseptic for disinfection.

However, Omogbai et al., revealed that many of the respondents do not wash hands before changing gloves in the event of torn gloves. Also, authors declared that total of 65.7% usually leave dental operatory without washing their hands and little more than half of the respondents would not wash hand before lunch [3].

In this research, about two thirds of studied dentists (63.5%) reported absent monitoring of hand washing by Faculty of Dentistry. These results were consistent with Omogbai et al., who reported that reasonable number of respondents strongly disagreed that there was any monitoring of hand washing to ensure compliance in the health institution. Formulation of policy geared at monitoring hand hygiene compliance in this institution is therefore recommended [3].

There are a number of known factors affecting compliance with hand hygiene such as lack of time, high patient workload, patients' needs taking priority, forgetfulness, lack of knowledge of importance of hand hygiene in preventing cross infection, poor access to hand washing facilities, lack of institutional commitment and skin irritation to hand hygiene products [16,20]. In current study, lack of time and facilities and are the most common barriers for hand hygiene. Moreover, Omogbai et al., showed that, the main barriers to regular hand hygiene in descending order were lack of adequate facilities, forgetfulness and lack of time [3]. Lack of time has also been cited as a barrier to hand hygiene among dentists by Barrett et al (2008) [20].

Naik et al., also reported that, the main reasons for lack of compliance included the following were skin irritation and dryness after hand washing; lack of facilities and lack of time [9]. The findings of the current study should be interpreted carefully due to the low Hepatitis B vaccination coverage and lack of institution monitoring regarding hand hygiene and infection control guidelines. Furthermore, education of the dentists and dental students is warranted to improve compliance and the efficacy of hand hygiene practices, and skin health. The limitations of this study that it is a single centre study with limited sample size. Dental nurses were not involved in the current study although dental nurses are responsible for the disinfection & sterilization of instruments and disposal of waste.

University dental clinics are suffering from limited resources with improper monitoring for infection control measures. Hence, the study of hand hygiene practice is crucial. High knowledge of the role of hand washing in the prevention of cross infection and good hand washing practices was found. Poor monitoring of hand hygiene and hepatitis B vaccination coverage among dentists was found. There is a need for health educational and motivational intervention targeted at dentists mostly in form of seminars and pamphlets. Public health dentistry department should create policies monitoring infection control guidelines with obligatory HB vaccination for all dental staff and students. Providing hand washing facilities, drying methods and eliminating barriers to hand washing, supplying personal protective equipment should be supported by current institution.

Conflict of Interest

We declare that we have no conflict of interest.

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