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General Dentists' Knowledge About Infection Control of Dental Impressions Between Clinic and Laboratory in South Khorasan Province

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Abstract

Background and Objectives: Dental clinic and laboratory are environments where infectious diseases' transmission occurs easily and prevention of cross infection between these places is a crucial issue in dental practice. The purpose of this study was to evaluate the knowledge of general dentists about infection control of dental impressions between clinic and laboratory in south Khorasan province.

Methods: In this cross - sectional study that done in 2014, the knowledge of dentists was assessed through a questionnaire consisting of twenty questions. For any questions a score from zero to two was awarded. For data extraction, scores of responses to each question were added together and the average was presented. For scores more than 34 good knowledge, between 25 and 34 moderate knowledge and less than 25 weak knowledge were reported. Level of dentists' knowledge based on their gender, work experience and university was also assessed. Data were analyzed by statistical software SPSS 16 in which Kruskal - Wallis and Mann - Whitney tests were used.

Results: The average knowledge of general dentists about the studied subject was moderate (31.75 ± 3.85). There was not a significant difference between the average knowledge of dentists and gender as well as work experience ($p > 0.05$), but the mean of knowledge based on universities, showed significant differences ($p = 0.003$).

Conclusions: Considering the importance of infection control in dentistry and according the results of this study, a greater emphasis on teaching this topic in undergraduate course and holding continuing education courses for dentists on this field is recommended.

Keywords: Knowledge, Dentists, Infection Control, Dental Impression

1. Background

Preventing the transmission of infectious diseases in dentistry is an essential issue in this profession (1). Despite the existence of occupational rules related to job protection and infection control in most countries and also continuous monitoring of supervisor agencies to enforce rules; we still witness of poor infection control even in some developed countries (2). Recognition of patients with infectious diseases are not always possible with the help of medical history, physical examination or laboratory tests; so infection control for all patients must be performed completely. For these reasons, knowledge of dentist's about the newest and most reliable processes of infection control is of utmost importance (2).

It has been demonstrated that impressions and dental prostheses are a way of infection transmission such as cold, Pneumonia, Tuberculosis, HIV, B and C hepatitis (3-5). Therefore, disinfection of the impressions and dental prostheses needs specific attention (6). According to the FDI recommendation all patients' prostheses should be cleaned and disinfected before delivery to laboratory. Also ADA recommends that all of impressions and prostheses should be disinfected (7). In a survey conducted by Hatzikyriakos et al. 26% of laboratories did not disinfect the impressions. Moreover 56% of individuals said they have no training about infection control in laboratories (8). Zaker Jafari and Mohammad Salimi, reported that 84.8% of students did laboratory work with the same contaminated gloves or without any gloves. No student disinfected impressions before sending to laboratory or the

posted works from laboratory before delivery to the patient. 91.1% of the students believed that disinfection of impressions prepared in prosthodontic department, should be taught to them practically. Taheri et al. reported that the knowledge of dentists practicing in Tehran about disinfectant solutions and how to apply them is weak (9).

The level of Sari's dentists' knowledge about principles of disinfection and sterilization was investigated by Haghanifar and Heydari, the mean awareness of female dentists was more than males and in specialist dentists was more than general practitioners. Dentists with five years' work experience or less had the highest awareness. Awareness of dentists graduated from dental faculties of main universities (Tehran, Shahid Beheshti, Mashhad, Esfahan, Shiraz) was less than graduated from other universities (10). According to Pang and Millar study, among 93% of individuals who disinfected the primary impressions; only 74% of them disinfected the final impressions. 37% of dentists informed the laboratory technician whether the impression had been disinfected or not (11).

Regardless of the disinfection of impressions by dentists, 50% of dental technicians disinfected all impressions and 64.7% announced that received impressions had been disinfected by dentists previously (12). According to importance of this subject and in order to decision making for future planning, the aim of this study was evaluation of general dentists' knowledge about infection control of dental impressions between clinic and laboratory in South Khorasan province.

2. Methods

The population examined in this cross - sectional study was 93 general dentists of South Khorasan province (cities of Birjand, Nehbandan, Sarbisheh, Boshruyeh, Ferdos, Sarayan, Asadiyeh, Khusf and Qaen). Information of individuals in the study including demographic features (age and gender), work history and the university graduation was completed by themselves using a questionnaire for evaluation of general dentists' knowledge about infection control of dental impressions between clinic and laboratory. The validity of the questionnaire was confirmed through its distribution among professors of Zahedan dental faculty. To confirm the reliability, the questionnaire was distributed among 35 dentists and the answers were analyzed so that Cronbach's alpha coefficient was 0.71. Participation in the study was completely voluntary and participants consent was obtained by informed consent form of participation in the research projects. In addition, the identity and information of participants remained confidential.

The questionnaire was consisted of 20 questions to assess the knowledge of dentists. A score from zero to two was given to each question's options (0: wrong, 1: I don't know, 2: true). For data collection the scores to each question were summed together and finally average of each groups were presented. Good knowledge for score more than 34 was considered, moderate knowledge for scores between 25 to 34 and poor knowledge for scores less than 25. After completing the questionnaire, correct answers were given to participants. Data were analyzed by SPSS (version 16) software and non - parametric tests (Mann - Whithney & Kruskal - Wallis).

3. Results

Overall 80 dentists (86%) participated in this study. The mean age was 36.56 ($\pm$ 8.76) years old and the mean work experience was 10.06 ($\pm$ 8.33) years. 61.3% of them (49 people) were men and 38.7% of them (31 people) were women. Frequency distributions of participants have been shown in table 1 in proportion to age, work experience and university graduation (Table 1).

Table 1. Frequency Distribution Based on Age Categories, Work Experience and University Graduation

Parameters	Numbers	Percentage
Age categories		
Less than 30 years old	31	38.8
31 - 40 years old	12	15
More than 40 years old	37	46.2
Total	80	100
Work experience		
Less than 5 years	36	45
6 - 15 years	21	26.3
More than 16 years	23	28.7
Total	80	100
University		
Mashhad	21	26.2
Tehran	20	25
Zahedan	27	33.8
Rafsanjan	4	5
Kerman	8	10
Total	80	100

The mean knowledge score was 31.75 $\pm$ 3.85 of 40. The highest awareness percentage of individuals participated in this study was related to moderate knowledge level

(60%) and the lowest was related to weak knowledge level (6.2%). It means that the knowledge level of most dentists about the studied subject was moderate. The mean knowledge of participants based on gender, age categories and work history did not show significant statistically differences ($P > 0.05$). The average knowledge of participants based on universities graduation showed significant differences ($P = 0.003$) so that graduates from Zahedan university had the highest level of knowledge about the subject (Table 2).

Table 2. Mean Knowledge Score Based on Age Categories, Work Experience and University Graduation

Parameters	Percentage
Gender	
Male	31.84 ± 3.89
Female	31.61 ± 3.86
P value	> 0.05
Age categories	
Less than 30 years old	31.52 ± 3.83
31 - 40 years old	30.58 ± 2.87
More than 40 years old	32.32 ± 4.12
P value	> 0.05
Work experience	
Less than 5 years	31.78 ± 3.80
6 - 15 years	30.76 ± 3.16
More than 16 years	31.75 ± 4.42
P value	> 0.05
University	
Mashhad	32.81 ± 3.48
Tehran	30 ± 4.82
Zahedan	33.15 ± 2.81
Rafsanjan	31.50 ± 3.87
Kerman	28.75 ± 2.05
P value	0.003

4. Discussion

According to the results of the present study, there was not a significant difference between the average knowledge of dentists and gender as well as work experience but the mean of knowledge based on universities, showed a significant difference.

Because of dentists' exposures with blood, mucous and saliva, their equipment and work environment are permanently exposed to contamination. For this reason and according to lack of cognition of all infectious patients, dental impressions and prostheses should be disinfected before sending them to laboratory and after delivery from the lab (13). Laboratory processes that performed on impressions, contaminated casts and non - disinfected prostheses can cause a dangerous cycle of cross - contamination which involves dentists, laboratory technicians, patients and auxiliary personnel (14).

Knowledge level of male dentists participated in this study about infection control of dental impression (49 people) was 31.84 ± 3.89 and 31.61 ± 3.86 for female dentists (31 people), there was no significant statistically difference between them. This result was the same as Alipour et al. study who report no significant statistically difference in mean knowledge scores about infection control between male and female dentists (15). In Haghanifar et al. study, although the level of awareness about sterilization principles and disinfecting in female dentists was more than male dentists but it was not significant (10). Also the results of Mahdi pour et al. study and Ehsani et al. study based on gender were in line with the result of the current study (16, 17).

The mean knowledge of participants based on age categories did not show significant statistically differences in Taheri et al. study. In their research with the aim of evaluation of knowledge and attitude of Tehran dentists about disinfectant solutions; a reverse and significant relation between age and number of correct answers was shown (9). Also according to the results obtained in the current study, no significant difference was found between dentists' work experience and their knowledge level about infection control of dental impressions. The probable reason could be that dentists who have less work experience and graduated recently; still have enough theoretical knowledge in the field of infection control in their mind and people with more work experience keep their knowledge up to date through attending in continuous education courses. Alipour et al. reported no significant correlation between two parameters; work experience and infection control awareness (15). In Haghanifar and Heydari study, dentists with 5 years' work experience or less had the most awareness about disinfection principles and sterilization although, this difference was not meaningful (10). Authors believe that achieving this result is because of increasing importance of infection control, also awareness of dentists to these principles is an obvious matter. However, in some studies, this relationship was significant. Results of Mahdi pour et al. study showed that in parallel with increasing of dentists' work experience, their awareness about infection control methods decreases (16). Also, in Leggat et al. study with the aim of assessing infection control of Thai-

land's dentists, it was concluded that dentists with more experience are more successful in infection control compared with their young coworkers (17).

The mean score of participants' awareness about infection control of dental impressions showed a significant difference base on universities graduation. In this study graduates from Zahedan university had the most awareness and graduates from Kerman University had the least awareness. According to these items it can be concluded that educating in main universities does not mean of more awareness about infection control necessarily. In Haghanifar et al. study, dentists' awareness graduated from main universities was less than other universities although the difference was not meaningful (10).

Overall, the mean knowledge of individuals in this study was 31.75 $\pm$ 3.85 out of 40 score so that the most dentists' awareness was related to moderate level (60%). Also in Alipour et al. study, the average knowledge of Bandar Abbas's dentists about infection control was estimated moderate (15). In Haghanifar et al. study, the average awareness of Sari's dentists about sterilization principle and disinfection was 11.8 out of 20 score (10). Taheri et al. reported that the level of Tehran's dentists' awareness about disinfectant solutions and their application is weak (9). Factors affecting the rate of awareness could be the university graduation, work experience, the person's attitude about this issue and participating in continuous education programs. Yuzbasioglu et al. identified the lack of dentists' interest in infection control issue and enough continuous education as the main reasons for weak awareness of Turkish dentists in this field (18).

According to Benley George study, students should be communicated the associated risks and importance of transmission of infectious diseases and exposures during dental treatments. Dental schools should focus on constantly motivating students in the correct and routine use of infection control measures and strictly monitor the adherence to the guidelines (19). Although, the students of dental technology who become dental technicians in future, should be educated in this field as well (20). Gupta et al. reported that most of the technicians were not aware of basic infection control protocols (21). According to Moradi Khanghahi et al. systematic review, the knowledge, attitudes and practice of infection control in Iranian dental settings were found to be inadequate. Therefore, dentists should be educated more on the subject and special programs should be in place to monitor the dental settings for observing infection control standards (2). Also, Tada stated that it is necessary to monitor whether compliance with infection control practices (ICPs) among dentists has improved over time and to elucidate factors associated with the improvement of ICPs (22).

4.1. Conclusion

According to the importance of infection control in dentistry and results of this study, more emphasize on teaching this subjects during general dentistry course and more accurate monitoring on the observation of infection control by students in therapeutic departments are suggested. Also, in order to improve dentists' knowledge in this domain, planning continuing education courses and the use of educational brochures are recommended.

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Footnote

Conflict of Interest: The authors declare no conflict of interest.

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