

General Dentists' Knowledge about Disinfecting Dental Impressions

Mehrak Amjadi¹, Amir Hussein Shakibamehr², Kamran Sharifi³, Shima Aalaei^{1*}

Department of Prosthodontics, Dental Caries Prevention Research Center, Qazvin University of Medical Sciences, Qazvin, Iran¹

Department of Prosthodontics, Alborz University of Medical Sciences, Karaj, Iran²

General Dentist, Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran³

Corresponding author: 1*



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ABSTRACT

Considering the importance of cross-infection control, this study was performed to assess the knowledge of general dentists in Qazvin about the current practice of disinfecting dental impressions. In this cross-sectional study, questionnaires were distributed to 109 general dentists. The questionnaires consisted of 10 questions; the mean correct answers to a minimum of 8 questions were considered as good, the mean correct answers to 5–8 questions as moderate, and to <5 questions as poor. The subjects' level of knowledge under study was the percentage of subjects providing correct responses to >8 questions. Data were submitted to t-test and ANOVA on SPSS 25. The knowledge level of general dentists was 39.4%, with a mean correct response rate of 6.61 ± 1.83 . The knowledge level of female dentists was significantly higher than that of male dentists ($P=0.00$). Moreover, the dentists with a job experience of ≥ 5 years were significantly less aware than those with <5 years of experience ($P=0.00$). According to the results of this study, the general dentists in Qazvin have moderate knowledge of disinfecting dental impressions. Attempts should be made to increase their knowledge through continuous education.



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1. INTRODUCTION

In recent years, the problems posed by AIDS and hepatitis B and C and COVID-19 have necessitated greater attention to the transmission of contaminants [1]. Dental impressions, dentures, and other appliances placed in the oral cavity might transmit infections [2] therefore, they must be disinfected. Since various types of chemical disinfectant materials are available [3], it is crucial to select the proper type and technique for disinfecting impressions. Some studies have been carried out on dentists' knowledge about the disinfection of impressions in Iran and other countries. In this context, the knowledge of general dentists in [4] was reported to be 31% in 2005 and 26% in 1997 [5]. The knowledge rates were reported to be 45% in 2005 in [6], 42% in [7], 28.4% in [8], and 31% in [9]. In a similar study in Jordan by the knowledge rate was 41% [10]. [11] carried out a study in Karachi, Pakistan, in 2014 to evaluate dentists' knowledge about the materials and techniques used to disinfect impressions and reported that 44% of dentists were

adequately aware of these items. [12] reported a knowledge rate of 10.8% in Rasht, Iran, in 2014 with no significant differences between males and females. [13] reported a knowledge level of 6.45% in Ahwaz in 2013, with a decrease in awareness with years in the practice. [14] reported a knowledge rate of 32.4% for general dentists in Qazvin in 2009, with significant effects of gender, job experience, and the route of entry into the university on this rate. [15] reported a knowledge rate of 18% for disinfection of impressions in Tehran, with an inverse relationship with job experience; in addition, the university from which the dentists graduated and gender affected the knowledge rate. In a study by [16], the knowledge of general dentists in south Khorasan was 33.18%, with a moderate mean of correct answers. Since most studies in Iran have been carried out with the use of one specific questionnaire, it is possible to compare subjects in Iran at different locations and times. Because of the importance and effect of this knowledge on the general health of the community, the present study was undertaken to evaluate the knowledge of general dental practitioners in Qazvin about disinfecting impressions.

2. MATERIALS AND METHODS

The subjects in this study consisted of 109 volunteer general dental practitioners in Qazvin, of 140 dental practitioners introduced by the Deputy for Health and Treatment of Qazvin University of Medical Sciences. This cross-sectional study was carried out in spring 2020, and the relationship between knowledge and gender, the route of entry into the university, and the years in practice were evaluated. The validity and reliability of the questionnaire were evaluated (Pearson's correlation coefficient = 91.03, Cronbach's α = 0.86). In the present study, the questionnaire was prepared similar to previous studies [4- 10], [14], [15] to facilitate the comparison of the results. The questionnaire consisted of 10 questions. The first question was a general one, and the remaining questions were divided into four categories based on the type of the impression material (alginate, additional and condensational silicones, polyether, and zinc oxide-eugenol). The questionnaires were completed in person in the presence of the researcher. Each impression material was questioned concerning the best methods for disinfection, the proper concentration of the disinfectant, and the time required. The dentists' knowledge was classified based on the results of previous studies [4-10], [14], [15]. In this context, the mean correct answers to a minimum of 8 questions were considered good, 5-8 questions as moderate, and <5 questions as poor. The level of knowledge of the subjects under study was the percentage of subjects providing correct responses to >8 questions. Data were analyzed with SPSS 25 (IBM Corporation, USA, 2017). Student's t-test and ANOVA were used to compare knowledge separately for gender, job experience (<5 years and \geq 5 years), and the route of entry into the university (University Entrance Exam, the specific entrance exam for oral hygienists, and transferred from other countries). Statistical significance was set at $P < 0.05$.

3. RESULTS

Of 140 dentists on the list, 109 (77.8%) replied to the questions on the questionnaire, with 84 (77.1%) and 25 (22.9%) being male and female, respectively. In addition, 69 dentists (63.3%) had entered the university by taking the University Entrance Exam, 13 (11.9%) were transferred from other countries, and 27 (24.8%) had passed the specific entrance exam for dental hygienists. Of all these 109 dentists, 69 (63.3%) had been in practice for <5 years, and 40 (36.7%) had a job experience of 5 years or more. The knowledge of 39.4% of the participants was good, with 51.4% and 9.2% exhibiting moderate and poor knowledge, respectively. The mean correct response rate was 6.61, with a standard deviation of 1.83. Table 1 shows the frequently distribution of dentists' answer to the questions. The means and standard deviations of female and male dentists' knowledge scores were 7.8 ± 1.58 and 6.26 ± 1.75 , respectively, with significantly higher scores in female dentists compared to male dentists ($P = 0.00$). Evaluation of knowledge in terms of job experience showed a significant and negative effect on knowledge; in this context, dentists with five years or more in practice exhibited lower knowledge scores than those with less than five years (6.03 ± 2.03 vs. 6.96 ± 1.61)

($P=0.00$). The mean knowledge scores of dentists entering the university through the University Entrance Exam, those taking part in the specific entrance exam for oral hygienists, and those transferred from universities in other countries were 6.94 ± 1.69 , 5.7 ± 2.02 , and 6.77 ± 1.59 , respectively, with significant differences between the scores ($P=0.01$), with oral hygienists exhibiting the least scores ($P=0.01$).

4. DISCUSSION

This study showed that the knowledge level of general dentists in Qazvin was 39.4%, with a mean of 6.61 ± 1.83 for correct answers. Studies available on dentists' knowledge in this field have yielded different results, with a range of 6.5– 48% (4-16). In most studies that have used a questionnaire similar to that used in the present study, a knowledge range of 26–48% has been reported [4- 10], [14], [15]. The results of the present study with 39.4% are in the high range because most studies in this field have indicated an increase in dentists' knowledge in recent years. In this context, a study by [7] in Hamadan in 2006 showed a knowledge rate of 42%, which indicated an increase in knowledge compared to a study by (31%) [4] (26%) [5] in the same city in 2005 and 1997, respectively. The knowledge in Qazvin, too, increased compared to a study carried out in 2009 [10] (39.4% vs. 32.4%). Some studies have used other questionnaires, which have yielded very diverging results in terms of the difficulty of the questions. Studies by [12], [13], [15], [16] have yield knowledge scores of 10.8%, 6.45%, 18%, and 33.8%, respectively. It should be pointed out that the study populations have been different in these studies, and studies have shown different knowledge levels in different populations [17]. Virtually in most studies, female dentists have exhibited higher knowledge levels than male dentists [4- 11,13-15], which might be explained by the fact that female dentists pay more attention to such matters and are more sensitive about them. Furthermore, in the present study, job experience was evaluated as a confounding factor, and it was shown that there was no significant difference in knowledge scores between female and male dentists with five years or more of work experience. However, there was a significant difference in knowledge scores between male and female dentists with job experiences <5 years ($P<0.05$). [12], [16] did not report any significant differences in knowledge between male and female dentists. It was explained by the confounding role of work experience. There was no significant difference between knowledge and job experience in these studies. In the present study, dentists' knowledge with job experience <5 years was significantly higher than that of dentists with ≥ 5 of job experience. Most similar studies in different cities in Iran, too, have shown that knowledge decreases with an increase in job experience [4- 9], [13- 15], which might be attributed to the increase in daily professional activities of this group of dentists and their separation from the university and also the shortcomings of continuous education programs and the fact that such individuals do not take part in such programs.

Concerning the route of entry into the university, since most transferred students from other countries did not volunteer to participate in the study, a definitive opinion cannot be expressed about this group. However, the knowledge of those entering the university through the University Entrance Exam was higher than that of oral hygienists. However, it should be pointed out that the results reported are on a questionnaire like many other studies and the subjects performance is much poorer than their knowledge [18], [19]. In a study by 91.2% of dentists claimed that they rinsed and disinfected impressions but 40.7% of them were nearly satisfied with our performance [20], indicating a lack of consonance between their claim and performance. Considering the results of studies concerning the possibility of transmission of pathogenic microorganisms through dental impressions, it is necessary for authorities and supervising organizations to get further involved in informing and educating dentists and monitoring their performance in such a field.

5. REFERENCES

- [1] Simiari H. Infection Control in Dentistry. Tehran: Azma Publishing; 2005. p.10.
- [2] Aslanimehr M, Mojarad N, Ranjbar S, Aalaei S. In vitro comparison of the effects of microwave irradiation and chemical and mechanical methods on the disinfection of complete dentures contaminated with *Candida albicans*. Dent Res J (Isfahan) 2018; 15(5): 340-6.
- [3] Mojarad N, Khalili Z, Aalaei S. A comparison of the efficacy of mechanical, chemical, and microwave radiation methods in disinfecting complete dentures. Dent Res J (Isfahan) 2017; 14(2): 131-6.
- [4] Jalili M. Evaluation of general dentist's knowledge of patient mouth made impressions disinfection. [Thesis]. Hamedan: Hamadan University of Medical Sciences; 2005, Thesis NO.395.
- [5] Ahmadian M. Evaluation of impression's disinfection quality in dental office and lab in Hamadan. [Thesis]. Hamadan: Hamadan University of Medical Sciences; 1997, Thesis NO.53.
- [6] Moali Rodsarei M. Evaluation of general dentist's knowledge of patient mouth made impressions disinfection. [Thesis]. Mashhad: Mashhad University of Medical Sciences; 2005, Thesis NO.1439.
- [7] Tavakoli A. Evaluation of general dentist's knowledge of patient mouth made impressions disinfection. [Thesis]. Hamadan: Hamadan University of Medical Sciences; 2006, Thesis NO.385.
- [8] Bazaz S. Infection control of dental office (Ghaemshahr). [Thesis]. Babol: Babol University of Medical Sciences; 1999-2000, Thesis NO.61.
- [9] Alborzina H. Evaluation of general dentist's knowledge of patient mouth made impressions disinfection. [Thesis]. Babol: Babol University of Medical Sciences; 1998, Thesis NO.28.
- [10] Al-Omari MA, Al-Dwairi ZN. Compliance with infection control programs in private dental clinics in Jordan. J Dent Educ 2005; 69(6): 693-8.
- [11] Amin F, Sheikh AA, Qureshi A, Abbas M. Prevailing Knowledge and practices about dental impressions disinfection. J Pak Dent Assoc 2014; 23(4): 164-9.
- [12] Zaker Jafari H, Dadashi S, Aghajani R, Pourhabibi Z. Knowledge and Practice of Dentists Regarding Disinfection of Impressions Sent to Laboratory. Journal of Dentomaxillofacial Radiology, Pathology and Surgery 2014; 3(3): 1-7.
- [13] Lavaf SH, Azizi A, Shantia M. Knowledge and attitude of general dentists of Ahwaz about disinfection of dental impressions. J Isfahan Dent Sch 2013; 8(7): 676-83. [Persian]
- [14] Bayat F. Evaluation of general dentists' knowledge of patients' dental impression disinfection in Qazvin. [Thesis]. Qazvin: Qazvin University of Medical Sciences; 2009.
- [15] Mokri M. Evaluation of knowledge dentists about disinfection dental impression. [Thesis]. Tehran: Islamic Azad University, Tehran Medical Branch; 2005.
- [16] Mostafavi A S, Motahary Moghadam G, Hajjani N. General Dentists' Knowledge About Infection

Control of Dental Impressions Between Clinic and Laboratory in South Khorasan Province, Zahedan J Res Med Sci 2018; 20(3): e22031.

[17] Jain AR, Fauzi N. Knowledge, attitude, and practice on various disinfectants used for impression materials among dental students and dental practitioners. Drug Invention Today 2018; 10: 23-8.

[18] Ghahramanloo A, Sadeghian A, Sohrabi K, Bidi A. A microbiologic investigation following the disinfection of irreversible hydro colloid materials using the spray method. J Calif Dent Assoc 2009; 37(7): 471-7.

[19] Sarchami R, Rajaei S, Aalaei S. Evaluation of the relationship between religious beliefs and academic achievements of dental students. J Educ Health Promot 2020; 9: 305.

[20] Halawani R, Aboalshamat K, Alwsaidi R, Sharqawi S. Awareness and Practices of Dental Students and Dentists Regarding Infection Control in Prosthodontic Clinics. The Open Dentistry Journal 2020; 14(1): 184- 90.

Table 1. Frequently distribution of dentists' answer to the questions Question

Question	Correct answer		Incorrect answer	
	Number	Percentage	Number	Percentage
No. 1	11	10.1	98	89.9
No. 2	31	28.4	78	71.6
No. 3	64	58.7	45	41.3
No. 4	46	42.2	63	57.8
No. 5	55	50.5	54	49.5
No. 6	50	45.9	59	54.1
No. 7	22	20.2	39	35.8
No. 8	39	35.8	70	64.2
No. 9	24	22	85	78
No. 10	27	24.8	82	75.2

Questionnaire [Reference of the answer: 16]

1. Which action is taken to disinfect the impression first?
 - A) Rinse with water ✓
 - B) Rinse with sodium hypochlorite
 - C) Rinse with saline solution
 - D) Spray with a disinfectant

2. To disinfect the alginate impression, which method is recommended?
 - A) Rinse with water, dip in a disinfectant
 - B) Rinse with water, dip in a disinfectant, rinse again ✓
 - C) Spray with a disinfectant, rinse with water
 - D) Rinse with saline solution, spray with disinfectant, rinse again

3. Which of the following materials is used to disinfectant all types of impression materials?
 - A) Dipping in 2% glutaraldehyde
 - B) Iodophor
 - C) Sodium hypochlorite ✓

- D) Phenolic compounds
4. How long is recommended to disinfectant alginate impression by immersion in the disinfectant?
A) 5 minutes B) 10 minutes ✓ C) 15 minutes D) 20 minutes
5. Which one is recommended for disinfecting a zinc oxide impression material?
A) Alcoholic solutions
B) Complex phenolic compounds
C) Spraying with sodium hypochlorite
D) Dipping in 2% glutaraldehyde ✓
6. Which one is recommended for disinfecting a polyether impression material (like Impergam)
A) Spraying with 2% glutaraldehyde
B) Spraying with sodium hypochlorite ✓
C) Spraying with alcohol
D) Spraying with iodophor
7. Which method is recommended for disinfecting condensational silicone impression material?
A) Rinsing with water, immersing in a disinfectant
B) Rinsing with water, immersing in a disinfectant, rinsing again ✓
C) Spraying with a disinfectant, rinsing with water
D) Rinsing with saline solution, spray with a disinfectant
8. Which sentence is correct about the remnants of disinfectants on the impression?
A) Must be washed with water
B) Must remain on the impression ✓
9. Which method is recommended for disinfecting the hydrophilic type of additional silicone?
A) Dipping for >10 minutes
B) Dipping for <10 minutes
C) Spraying for >10 seconds
D) Spraying and wrapping in plastic bags for 10 minutes ✓
10. Which option is correct when disinfecting the impression?
A) The contact of the disinfectant with the tray is also necessary. ✓
B) The contact of the disinfectant with the tray is not necessary.