

## **Research Article**

### **Evaluation of knowledge, attitude and practice of dentists in regard to observing mercury hygiene principles in Zahedan private offices and clinics in 2012-2013**

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**Abstract:** Amalgam is the restorative material that is used widely all over the world. This substance is known as a toxic material as a result of the presence of about 50% mercury in these restorations. Hence, the aim of this study is to evaluate the knowledge, attitude and practice of dentists in regard to observing mercury hygiene principles in Zahedan private offices and clinics in 2012-2013. In this descriptive-analytical study, population statistical data were collected using a standardized questionnaire, which was completed by 64 dentists (55 general practitioner and 9 expert), at the end. To analyze data, SPSS 19 software and Chi-square and Pearson's correlation coefficient were used. In results among dentists, 53% were male and 47% were female. The knowledge score average of 24 was  $14.33 \pm 3.492$ , and the mean practice and attitude scores were  $7.41 \pm 1.95$  and  $22.69 \pm 2.678$  of 14 and 27, respectively. In conclusion the results of this study showed that the knowledge, attitude and practice of dental concerning mercury hygiene principles were almost in average.

**Keywords:** Mercury Hygiene, Amalgam, toxic material

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#### **INTRODUCTION:**

Amalgam is the restorative material that is popular all over the world [1], however, it has been known as a toxic material due to presence of about 50% mercury in these restorations [2]. The wide dental use of amalgam on the one hand and toxicity problem of mercury on the other hand, make the mercury sanitation essential. Mercury causes the increase of some human diseases through the effects on the cardiovascular and nervous system [3&4], and other organs of the body. The use of mercury could be more health threatening for dentists and other dental personnel than patients [5]. If the pollutant mercury related to the dental amalgam is not controlled properly, it may be endangered the health of people in dental clinics due to the increased amount of mercury vapor [6], since this occurs mostly during the preparation, placement and removal of amalgam [7]. In addition, the long-term exposure to mercury vapor may increase the risk of mercury poisoning [8]. As a result, awareness of principles of mercury optimized hygiene points and practicing them in order to protect the health of dental working staffs and the living environment should be at the top of the comprehensive clinics agenda. Hence, the aim of this study was to

evaluate the knowledge, attitude and practice of dentists in regard to observing mercury hygiene principles in Zahedan private offices and clinics in 2012-2013.

#### **METHOD & MATERIALS:**

The population of this cross-sectional study included general practitioners and specialists working in the private offices and clinics in Zahedan who had amalgam dental devices in their workplace and work with amalgam, and they were determined 96 people. Sampling was carried out according to the census test, in which 64 dentists cooperated with the study who was 55 general practitioners and 9 specialists.

Data were collected by questionnaires that were designed using the sources, results of other studies and references [9] and their reliability and validity were confirmed by an expert group. The questionnaires were consisted of two parts; the first part involved questions about the dentist demographic information (such as age, sex, years of employment, graduation and working place) and second part included questions related to knowledge (12 questions), attitude (9 items) and practice (11 items). The final implementation plan was

performed through visiting physicians' private offices and clinics in Zahedan and delivering questionnaire. Dentists cooperated in the study voluntarily and the research was conducted confidentially with no mentioning the names and addresses. At end of the study the answers were sent to e-mail of dentists.

Scoring the questions was as follows: 2 points for "True" answer, 1 for "do not know" and 0 for "false". The questions about attitude were three choices (agree, no idea and disagree) and they were got 1-3 points, 3 for "True", 1 for "False" answers. In the questions 24-27-28-32, the answer "true" means I agree, and in the questions 25-26-29-30-31, the "true" answer means "I disagree"; in the practice part, 1 point is given to TRUE and 0 for "FALSE". Except Question 13, in that a score of 4 is considered for "only capsulated", 3 for "more capsulated", 2 for "both equally" option, 1 for "more powdered" and 0 is set for "just powdered". In order to analysis the data statistically SPSS 19 software and Chi-square and Pearson's correlation coefficient were used.

**RESULTS:**

In the study group, 53% of dentists were male and 47% female. Mean and standard deviation about the

knowledge, attitude and practice of dentists are present in Table 1. The average level of knowledge, attitude and practice of the male dentists were 724.15±, 22.82± 2.15 and 7.12 ± 1.788 respectively, and 13.40 ± 3.568, 22.53± 2.662 and 7.73± 2.1 for female group respectively. According to (t-test) test, the difference between knowledge of men and women groups shows a significant relationship between gender and their knowledge (P-value = 0.045). While there was no significant difference between attitude and practice averages of male and female dentists (P-value > 0.05) (Table 2).

Based on table 3 there was important relationship between the dentists' working place and their practice regarding mercury hygiene practices (P = 0.007). However, it has found no significant difference between working place and knowledge and attitude variables of dentists (P> 0.05).

In the case of the relationship between these variables and age, work experience, university, and degree, it has been understood that, there was no significant correlation between any of the knowledge, practice and attitude variables with age and experience (P-value > 0.05).

**Table 1**

	Frequently Distribution		Pearson Coefficient	
	Average	Standard deviation	Awareness	Performance
<b>Awareness(0-24)</b>	14.33	3.492	-	0.834
<b>Performance(0-14)</b>	14.7	1.950	0.834	-
<b>Attitude(9-27)</b>	22.69	2.678	0.001	0.401

**Table 2**

Variable	Male		Female		Statistical results t-test (P-value)
	Average	Standard deviation	Average	Standard deviation	
<b>Awareness</b>	15.15	3.258	13.40	3.568	0.045
<b>Performance</b>	7.12	1.788	7.73	2.1	0.21
<b>Attitude</b>	22.82	2.724	22.53	2.662	0.669

**Table 3**

Working Place Variable	Office	Clinic	Office and Clinic	Statistical results ANOVA
	Average And Standard deviation	Average And Standard deviation	Average And Standard deviation	
<b>Awareness</b>	13.98±3.8	15.29±1.254	15.08±3.288	0.478
<b>Attitude</b>	22.59±.872	23±3.055	22.83±1.899	0.914
<b>Performance</b>	7.66±1.952	5.29±1.38	7.83±1.528	0.007

**DISCUSSION:**

Amalgam has been widely used for posterior teeth restorations for more than 150 years, and there

have been particular concerns about mercury vapor which is emitted from mercury, especially in the case of office workers [10]. The World Health Organization has

set a standard for the maximum amount of mercury vapor in dental offices that is 50 µg /m<sup>3</sup> for working 40 hours in a week [9].

In order to respond to the question of whether enough knowledge and proper attitudes of dentist regarding mercury hygiene cause his/ her improved performance in the offices and private clinics or not, 64 dentists were selected for a descriptive-analytical study based on census method in Zahedan in 2012- 2013, who were 9 specialists and 55 general practitioners. Moreover, in this study the knowledge, attitude and practice (as the main variables), as well as their relation to a series of side factors (gender, educational background, work experience, the graduation and working place) of general dentists or specialists were studied. The results showed that the knowledge, attitude and practicing of the studied dentists were optimized and satisfactory, which the results of the knowledge were consistent with results of Sadig studies [11]. However, the obtained results about dental practice were inconsistent with Kulkarni *et al.*; study [12] . In the comparing the relationship between gender and knowledge, attitude and practice of dentists, a significant correlation was found between groups in the level of knowledge (P = 0.045), and the knowledge of male dentists regarding mercury was higher than of female dentists. While the practice and attitude of both genders were almost equal. It has been found a significant relationship between working place and dental practice, indicating that the proper designing and facilities in the offices will cause more considerations for health issues of mercury to dentists in private clinics. In this study, the connection between the knowledge, attitude and practicing of the participants with age, level of education, university and employment year's variables were examined and it was found no significant relationship. In order to determine whether the knowledge and attitudes of dentists as well as their practice on the knowledge and attitudes affect their performance or not; the correlation between variables was investigated but no significant relationship was seen between knowledge and attitude of dentists with their attitude and mercury hygiene practices, while it was found significant relation between dentists knowledges and attitudes (P = 0.001). It appears from these results that, some dentists are not ready to receive more information and to raise knowledge about health, in the mercury and accurate performance field.

#### CONCLUSION:

The results of this study showed that the knowledge, attitude and practice of dental concerning mercury hygiene principles were almost in average. It has understood significant relationship between knowledge and attitude of dentists, significant relationship between knowledge and gender Dentists was found as well. So that the mean score of knowledge

was higher in male dentists. A significant relationship between working place and dentists' performance was obtained. In this study, it was found no significant relationship between other demographic variables (age, work experience, university and degree).

#### Suggestions:

A high attention should be devoted for theoretical and practical training of students in dental schools in this field, substantial changes will come into operation in educational programs (to improve knowledge, attitude and practicing of dentists) in this regard. Training dentists, especially in retraining programs or through sending educational brochures as well as providing the standard model for designing offices by the relevant organizations and supporting them, consideration special associated features and facilities to dentists and officials seriousness regarding mercury dental hygiene practices can be helpful.

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