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# A study of knowledge, attitude and self-assessment of residents on evidence-based dentistry at Faculty of Dentistry of Tabriz University of Medical Sciences

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## Abstract

**Introduction:** Evidence-based dentistry is the combination of individual clinical experiences with the highest-quality evidence available as the result of systematic studies. Evidence-based dentistry is an approach in which the clinician uses the best evidence available to make the most appropriate decision for the patient. In this descriptive study, the knowledge, attitude and self-assessment of Tabriz dental school residents were examined on evidence-based dentistry in the academic year 2014-2015.

**Methods:** All residents of Tabriz Dentistry Faculty (100 in total) were enrolled in the study. The data collection tool was a questionnaire, and the validity of the questionnaire was determined in previous studies. To determine the reliability of the questionnaire, it was distributed among the 20 residents in a pilot study. Descriptive statistical methods were used to study the data obtained. Chi-square, *t* test, and Kruskal-Wallis tests were used to assess the relationship between variables using SPSS 20.

**Results:** The results showed that the level of residents' knowledge on evidence-based dentistry was moderate and 94.4% of residents had a positive attitude toward EBD. The highest and lowest self-assessments were related to the terms PubMed and Cochrane Collaboration (95% CI: 29.27-30.73, 42.06-43.32, 28.69-31.09, respectively).

**Conclusion:** Given the increasing importance of evidence-based dentistry and considering the moderate knowledge of the residents on the topic, a need is felt for proper planning to teach it at Tabriz University of Medical Sciences. Considering dentists' positive attitude toward EBD, it seems that there is an appropriate background for EBD education in the country.

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## Introduction

In 1976, a new process called evidence-based medicine was introduced by Canadian epidemiologist Gordon Guyatt at McMaster University to review scientific evidence in the field of medical sciences,<sup>1,2</sup> although more detailed studies indicate the use of this method by Razi and Avicenna centuries ago.<sup>3</sup> Like all medical specialists, dental specialists make decisions on clinical care every day. The best scientific evidence available should be integrated to maximize the probability of success on patient care outcomes. The ability to find, differentiate, assess and use information is the most important skill that should be learned by an expert.<sup>4</sup>

Evidence-based medicine is a five-stage process as follows:

1) devising answerable clinical inquiries, 2) finding the evidence, 3) critical appraisal of the evidence, 4) employing the evidence and 5) performance assessment.

One of the most important cases in clinical decision-making is the critical evaluation and judgment of the evidence because the use of false evidence can mean the loss of a human life.<sup>5,6</sup> It is essential that clinicians have the ability to search and retrieve relevant evidence, combine it with their own experiences and apply it to their own patients.<sup>7</sup> The use of evidence-based medicine significantly improves patient care, leads to shared decision-making among physicians and increases the satisfaction and trust of patients with the doctor.<sup>8</sup> According to the American Dental Association, "evidence-based dentistry" is a meth-

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od of oral health care that involves meticulous integration of regular evaluations of clinically applicable scientific evidence pertinent to patient history, both oral and medical, the dental practitioner's knowledge and the wants and needs of each patient.<sup>4</sup>

PubMed, The Cochrane Library and BMJ Clinical Evidence databases are the most common and important databases in medicine and meet the clinical needs of most physicians. In addition, it seems that people can visit other sites and databases after mastering the use of the aforementioned three.<sup>9</sup>

In the study carried out by Zare et al in Tabriz University of Medical Sciences on evidence-based approaches among faculty members, it was shown that 45.3% of people had no knowledge of evidence-based medicine.<sup>10</sup> Also, the study of Roohani et al done on faculty members in Yasouj showed that 85% of the respondents were not familiar with evidence-based medicine and 98% had no particular way to search and evaluate scientific papers.<sup>11</sup> Sadeghi et al studied the knowledge, attitudes and use of evidence-based medicine among medical residents in Kerman, and they found out that only 29.8% of residents were familiar with evidence-based medicine and the most common source for diagnosis and clinical decision-making was reference books.<sup>12</sup> In the study of Moeintaghavi et al conducted on the assessment of knowledge and attitudes of residents on evidence-based dentistry in Mashhad, they showed that despite positive attitudes toward evidence-based dentistry, only 5% of them practiced evidence-based dentistry in a routine manner.<sup>13</sup>

A review of the literature showed that in recent years, the training and development of evidence-based medicine and the effectiveness of training courses were taken into consideration. Evidence-based medicine in the universities of the country both at the undergraduate and postgraduate levels, especially after 2012, was paid attention by the Ministry of Health, Treatment and Medical Education.<sup>14</sup>

As some of the most important teachers, residents play a dominant role in the use of evidence-based dentistry concepts in daily activities and clinical decision-making and in transferring the information to the students. This study was done to evaluate the knowledge, attitude and self-assessment of the residents in Tabriz Dentistry Faculty in terms of evidence-based dentistry. Necessary investments and measures can then be provided to improve future planning in this regard as the strengths and weaknesses of the knowledge and use of evidence-based dentistry among residents is revealed.

## Materials and Methods

In this cross-sectional descriptive study, the knowledge, attitudes and self-assessment of residents on evidence-based dentistry in Tabriz dental school were evaluated in April in the academic year 2014-2015.

### Study population

All residents of Tabriz dental school (100 in total) were enrolled in the study if they agreed to. To prevent any poten-

tial sources of bias all participants completed and returned the questionnaires in the presence of the researcher.

### Study tool and procedure

A questionnaire including four sections with closed questions was used for data collection. The first part was for the demographic information, the second part contained 10 questions on the knowledge of evidence-based dentistry, the third part contained 12 questions on attitudes toward it and the last part included questions on the self-assessment of the target group in relation to evidence-based dentistry.

### Validity and reliability of questionnaire

The validity of the questionnaire was determined in previous studies (i.e., Khami et al<sup>15</sup>). To determine the reliability of the questionnaire, it was distributed among the 20 residents in a pilot study. Results showed that the Cronbach alpha for knowledge questions was 0.81 and it was 0.76 for attitude, which means that questions and items were appropriate enough to measure the concept.

For scoring the questions, a score from one to five was given to each using the Likert scale, and the total scores of the second, third and fourth parts of the questionnaire, knowledge, attitude and self-assessment, were in the possible ranges of 10-50, 12-60 and 9-45, respectively. The knowledge scores were ranked as follows: poor (below 25), medium (25-40) and good (40-50), and attitude scores were ranked as follows: negative (below 36) and positive (36-60).

### Data analysis

Descriptive statistical methods were used to examine the frequency, percentage, mean and standard deviation. Chi-square, Kruskal-Wallis and independent *t* tests were used to analyze the relationship between variables. SPSS 20 was used for data analysis ( $P < 0.01$ ).

## Results

The study population was 100 dental residents of Tabriz Dental School of whom 89 completed the questionnaires; 64% of the residents were female and 36% were male. The mean age of the residents was 29.45 years, ranging from 25 to 46 years. The percentages of the residents graduated in various years were as follows: 6.7% in 1995-1999, 9.1% in 2001-2005, 39.3% in 2006-2009 and 34.8% in 2011-2014. The study of undergraduate schooling showed that 51.1% of the residents graduated from Tabriz University, 14.8% from Tehran University and 14.8% from other universities.

### Knowledge

The results showed that the average knowledge of dental residents on evidence-based dentistry was 30 (minimum 19 and maximum 41). The qualitative study on the residents' knowledge on evidence-based dentistry showed that the knowledge of 4.5% of the residents was poor, 93.3% was moderate and 2.2% was good. A chi-square test showed significant differences in the levels of knowledge

among residents ( $P < 0.01$ ; Table 1).

The  $t$  test showed no significant difference on the knowledge between the male and female residents. The Kruskal-Wallis test indicated no significant difference in the average knowledge based on residents' years since graduation (95% CI: 29.27-30.73).

### Attitude

A five-point Likert scale ranging from strongly disagrees to strongly agrees was used to answer the questions on attitude toward evidence-based dentistry. Attitude scores ranged from 12 to 60. The results showed that the mean attitude of the residents on evidence-based dentistry among the study residents was 42.69 (minimum 34 and maximum of 53). The attitude scores were ranked on the basis of a negative attitude (scores less than 36), and a positive attitude (scores 36-60). The type of attitude review showed that 5.6% of residents had a negative attitude toward evidence-based dentistry and 94.4% had a positive attitude. Based on the  $t$  test, there was no significant difference in the attitude of male and female residents and both had a positive attitude toward evidence-based dentistry. In addition, a Kruskal-Wallis test revealed no significant differences in the mean attitude based on the year of graduation, undergraduate and residency background (95% CI: 42.06-43.32;  $P < 0.01$ ).

### Self-assessment

Nine terms were used to determine Tabriz dental school residents' self-assessment on evidence-based dentistry. The terms were ranked in the form of a five-degree scale used to evaluate the residents' knowledge of the terms, including lack of knowledge, low knowledge, understanding the term, understanding and use of the term without the ability to define and understanding with the ability to define the term. Self-assessment scores of the nine terms ranged from 9 to 45. The results showed that the average of residents' self-assessment score on evidence-based dentistry was 29.89 (minimum 8, maximum 44).

The results of the self-assessment on the nine terms showed that the highest score was for self-assessment of the term PubMed, with 89.9% showing a grasp of the term (understanding and using terms without the ability to define and understanding with the ability to define the word), and Medical Subject Headings (MeSH), with 66.26% more than understanding the term. The lowest assessment was related to the term  $P$  value, with 70.78 percent not understanding the term (lack of knowledge and low knowledge), and the Cochrane collaboration with 53.94 percent not understanding the term (95% CI: 28.69-31.09;  $P < 0.01$ ).

### Discussion

This study was to determine the knowledge, attitude and self-assessment of the residents in the Tabriz Dentistry Faculty in terms of evidence-based dentistry in the academic year 2014-2015. The results of this study showed that 93.3% of residents had moderate knowledge on evi-

**Table 1.** Frequency of evidence-based dentistry knowledge among residents

|                            | Number | Percent | Chi-square test |       |
|----------------------------|--------|---------|-----------------|-------|
|                            |        |         | df              | P     |
| Poor knowledge (20>)       | 4      | 4.5     | 143.82          | 0.000 |
| Moderate knowledge (21-40) | 83     | 93.3    |                 |       |
| Good knowledge (41-50)     | 2      | 2.2     |                 |       |
| Total                      | 89     | 100.0   |                 |       |

dence-based dentistry.

A study conducted at Mashhad Dentistry School in 2012 on dental residents found that residents did not have exact knowledge of evidence-based dentistry.<sup>13</sup> Although the content of questionnaires is relatively similar in these two studies, in our study the majority of residents had moderate to good knowledge. This could be related to the difference between workshops about EBD in these universities. Sadeghi et al studied the knowledge, attitudes and use of evidence-based medicine among medical residents in Kerman in 2010, and they found that only 29.8% of residents were familiar with evidence-based medicine, only 23.4% of people were able to provide a definition of evidence-based medicine and 80.6% of respondents stated that evidence-based medicine and its use in practice can be effective in patients' treatment. Only 3.5% of respondents stated that they have used evidence-based decision-making in practice. The most common source for diagnosis was reference books (59.6%), and clinical experience was second (44.1%), with only 19.2% using the latest papers.<sup>12</sup> However, the difference between the study population and the date of study can justify the results. Also, Roohani's study done on faculty members in Yasouj in 2012 showed that 85% of respondents were not familiar with evidence-based medicine, 98% had no particular way to search and evaluate scientific papers and only 35% were familiar with the National Digital Library.<sup>11</sup> A study carried out by Zare et al at Tabriz University of Medical Sciences in 2006 on evidence-based approaches among faculty members indicated that 45.3% of people had no knowledge about evidence-based medicine. It also found that 46.1% of the individuals used PubMed databases to search for information, 29.7% of who used the databases specifically for evidence-based medicine and about 2.5% used public sites.<sup>10</sup> In a study done in Shiraz in 2007, it was reported that 70% of residents were not familiar with evidence-based medicine and 60.9% of participants declared that they used MEDLINE and other search engines for clinical decisions less than 10 times in the past year.<sup>16</sup> In another study also carried out in Shiraz in 2005, it was shown that despite the accessibility of all the residents to MEDLINE and Internet, they did not use it optimally, and only 10% claimed that they were able to critically evaluate medical texts.<sup>17</sup> In a study on the knowledge of undergraduate dentistry students on EBD, Khami et al found that 80% of the students knew little or very little about EBD, and more than 85% of them had little or very little knowl-

edge on the databases used in evidence-based dentistry.<sup>15</sup> In a 2012 cross-sectional study, Prabhu et al assessed post-graduate dental students' knowledge, outlook and obstacles concerning the practice of evidence-based dentistry in Saveetha University in India. The results showed that the postgraduates were acquainted with EBD sources, but they had a limited understanding of the terms associated with EBD. Researchers reported that respondents showed positive attitudes toward using EBD in clinical practice, but possible barriers still exist.<sup>18</sup> Bahammam et al did a cross-sectional study of final-year dental and medicine students and new graduates at King Abdul Aziz University, Jeddah. The knowledge and attitude toward evidence-based practice of 297 students was assessed. The reported knowledge and attitudes among the dental students did not meet the required competency standards. These findings illustrate the pressing need for new educational approaches for successful application of EBP in Saudi Arabia.<sup>19</sup> In another study Haron et al evaluated the awareness, knowledge and use of EBD among public-sector dentists in Kuwait. While 60.9% of the group said they practiced EBD most of the time, tested knowledge showed that 40.8% showed a reasonable understanding of EBD-related topics. Clinicians used individual judgment for most decision (73.3%), instead of utilizing evidence-based sources such as PubMed (28.3%) or the Cochrane Library (6.7%).<sup>20</sup>

In our study, the vast majority of residents (95.2%) had moderate to good knowledge on evidence-based dentistry. A comparison of the results of this study with the results of previous studies, including the 2006 study of Zare et al. in Tabriz, shows that the knowledge of evidence-based medicine in the last several years has grown dramatically,<sup>10</sup> which may be due to courses and workshops organized in Tabriz University of Medical Sciences and university activities about evidence-based medicine. In total, 61.8% of residents in the study stated that they have moderate, high and very high knowledge on the databases used in evidence-based dentistry, and 58.4% of them hoped to find the answers for their questions by searching in the scientific papers. However, 78.7% of residents stated that they rely on their scientific knowledge to provide desirable and appropriate treatment and they found it an efficient and useful method to provide an effective treatment plan. Evidence-based medicine is a multidimensional concept, and after identifying the main question, the appropriate search and critical appraisal skills are the most basic and most essential skills necessary to function on the basis of evidence. In this study, 56.2% of residents had little or very little knowledge and 34.8% had moderate knowledge on the important criteria for a critical review of a scientific paper. Therefore, despite familiarity with databases, the majority of residents limit their treatment to their own knowledge due to their low ability to critically evaluate. The results of the residents' self-assessment showed that the highest level of self-assessment was related to the term PubMed with 73.03% able to understand and define the term, and systematic review was second to it with a sig-

nificant difference (35.96%). Only 6.74% and 5.62% of respondents were capable of understanding and defining the terms *P* value and Cochrane Collaboration, respectively. Little knowledge on some fundamental terms like Cochrane Collaboration and some common epidemiological terms in evidence-based medicine such as odds ratio, bias, *P* value and systematic review has also been observed in other studies, showing a need for training courses in the field. Based on the results, 94.4% of dental residents had a positive attitude on evidence-based dentistry.

Dental residents' positive attitude shows an appropriate basis for teaching evidence-based dentistry and ultimately its clinical application. By integration of EBD in education curriculum, the shortcomings in this area can be overcome. As mentioned, the combination of clinical evidence with research evidence is called evidence-based dentistry. Without this method, practitioners may decide on patients' problems using old and outdated information. In today's world of new dental information, residents should fully and effectively learn the use of information and guidance skills to diagnose and treat their patients applying the best medical evidence. It seems that there is a need for training dentistry residents in terms of epidemiological concepts and the terms used in EBD to enhance their ability to critically analyze the studied research articles to increase their ability to make appropriate and correct practical clinical decisions. Therefore, careful theoretical and practical planning, such as a class or workshop, seems necessary in the field. In the next step, it is important that an interaction occur between students and residents in terms of designing appropriate clinical questions and searching, retrieving and evaluating the validity of the evidence.

### **Recommendations**

There are strategies on evidence-based dentistry that are recommended for dentistry residents to learn more about. For instance, in each training method for residents, such as journal clubs and the grand rounds for clinical residents, a part of the time can be devoted to theoretical and practical training of EBD, such as asking residents to make decisions on at least one patient based on evidence-based dentistry for the coming week or month and explaining the process. Access to computers and the Internet at work can encourage dentists to use correct and updated evidence as well. Hence, increasing awareness, knowledge, attitudes and the use of evidence in health care through the provision of appropriate training, financial and non-financial incentives, proper culture making and other necessary actions are crucial in this regard, and the authorities and policy makers should pay more attention to the field.<sup>2,17</sup> Since residents have very little time to participate in workshops and courses outside of the medical centers in which they are working, it seems that holding evidence-based dentistry workshops and systematic courses at regular intervals is a good solution to this problem.<sup>2,17</sup> Finally, creating a positive attitude about EBD in health management, along with material and spiritual encouragement and supporting the

dentists who use this method for treating their patients can be good strategies for encouraging other dentists to follow them.<sup>2,17</sup>

### Conclusion

Based on the results of the present study, it can be concluded that the level of residents' knowledge of Tabriz dental school on evidence-based dentistry was moderate and 94.4% of residents had a positive attitude toward EBD. The "highest" and "lowest" self-assessments were related to the terms PubMed and Cochrane Collaboration, respectively.

### Ethical approval

The present study was approved by Medical Research and Ethics Committee of Tabriz University of medical Sciences, Iran.

### Competing interests

The authors declare that there is no conflict of interests.

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