Original Article

Assessment of knowledge, attitude, and practice with regard to evidence-based dentistry among dental students in Isfahan University of Medical Sciences

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ABSTRACT

Aim: Evidence-based dentistry (EBD) is an approach to oral health that requires the application and examination of relevant scientific data related to the patient's oral health and his priorities. The aim of this study was to assess knowledge, attitude, and practice of dental students of Isfahan about EBD. **Materials and Methods:** In this descriptive study, 168 dental students in 3 final years of their education who engaged in clinical practice by consensus sampling were recruited. For data collection, a validated questionnaire was used. The questionnaire was consisted of demographic questions and some questions about four issues: Knowledge of self-assess (KSA), evidence-based practice, actual knowledge and attitude about EBD. Data were analyzed with *t*-test, one-way ANOVA, Chi-square, and linear regression with SPSS 16. **Results:** One hundred and thirty-six students from 168 students were filled the questionnaire. The mean of KSA was 13 ± 4.3, mean of usage of useful references in EBD was 16.9 ± 7.6. One-third of students were studied their last article in last 6 months before. The mean of actual knowledge and attitude was 7.4 ± 2.3 and 24 ± 3.8, respectively. The relation between 4 main issues was significant ($P < 0.05$). **Conclusion:** By considering overall interest and positive attitude toward learning EBD in dental students, it is highly recommended that practical educational courses about EBD be planned by dental faculties.

Key word: Attitude, dental student, evidence-based dentistry, knowledge, practice

INTRODUCTION

Dentistry major included two parts of knowledge and skill of using this knowledge.[1] Evidence-based dentistry (EBD) was introduced to connect this knowledge and skill based on a scientific method with the aim of achieving an ideal treatment for patients.[2]

Evidence-based dentistry

Evidence-based dentistry is a systematic approach to sum up the dentistry literature and papers that dental practitioners need to incorporated their experiences to it.[3]

Principles of EBD consist of using the appropriate combination of scientific evidence and clinical diagnosis based on patient's medical history and oral status, clinical skills of dentist, and treatment priorities.[4] The ultimate goal of EBD includes reduction of diagnostic errors, ensure the best treatment

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decisions and achieving the best clinical judgment.[5] The dental schools are expected to provide opportunities for students to be familiar with the principles of EBD and used them during their professional life to achieve scientific and accurate diagnosis and treatment of patients according to it.[2-5]

In a pilot study, Hay *et al.* evaluated the gap between evidence-based medical approach and clinical treatment and showed that most physicians in their treatment approach use their own and their colleagues clinical experiences and have less use of scientific and evidence-based medicine resources.[6]

Khami *et al.* in a study assessed awareness, attitudes, and knowledge of dental students in Shahid Beheshti and Tehran University of Medical Sciences, Tehran toward EBD. The results showed that despite the positive attitude of students towards EBD, their awareness and knowledge in this area is weak.[7]

Sabounchi *et al.* assess dental professor's knowledge toward EBD in Dental Schools of Iran. The results indicated an average level of knowledge with regard to EBD and a positive attitude toward learning it.[8]

Since familiarity with evidence-based approach has been assessed only in Dental Schools in Tehran,[7] it is needed to review the issues in other Dental Schools in Iran. For evaluating the educational requirements and eliminating educational weaknesses in this field. Therefore, the aim of this study was to investigate self-assessment knowledge, actual knowledge, attitude, and practice of dental school students in the 3 final last years of their education in clinical Departments of Isfahan Dental School toward EBD and its application in diagnosis and treatment of patients.

MATERIALS AND METHODS

In this cross-sectional descriptive study, 168 students in the last 3 years of dentistry who had been advocated in the clinical Departments of Dental School were recruited. The study conducted at Dental School of Isfahan, University of Medical Sciences in 2014.

The instrument used in this study was a questionnaire which is reliability and validity had been approved by Sabounchi *et al.*[8] The questionnaires were distributed during theoretical classes and after, a short explanation about the research purposes, they were asked to fill the anonymous questionnaires and return it to the researcher. The sampling method was a census, and the students who did not interest in participant were excluded.

The questionnaire consisted of two main sections and a total of 44 questions; in the first section there were seven demographic and background questions; and the second section included main questions in four domains. The first

domain assessed self-perceive knowledge of individuals on critical evaluation of studies. This section consists of six questions with 5-point Likert scale (1 = i do not have the awareness to 5 = i have a lot of awareness). Thus, total score knowledge of self-assessment (KSA) was obtained from 6 to 36.

The grades 6–18 were considered poor, 18–24 average, and 24–26 as good. In practice domain, in first section, the students were asked to rate their use of different EBD knowledge resources (for example teachers' experiences, original articles, systematic reviews, EBD guidelines and the Cochrane library, etc., each resource rated with the standard visual assay scale (VAS) from 0 to 10 and then average score of this section was calculated and considered as a basis for the rest of the comparisons.[9]

In the next part of practice domain, two questions regarding rate and interval of using articles in last year were asked, and its frequency was recorded. The third area was assessing real knowledge of students toward EBD that included 7 actual, 10 true or false questions and four multiple-choice questions (total 11 questions) in relation to different aspects of the EBD knowledge the score of actual knowledge was evaluated as the sum of correct answers ranged from 0 to 11.

In the last part, students' attitudes were assessed over eight questions with 5-point Likert scale (1 = very good, 5 = very disagreed). The total score of attitude ranged from 0 to 36 was allocated to each one; the scores were classified as the following:

0–9: Poor attitude, 9–18: Average attitude, 18–27: Good attitude, 27–36: Excellent attitude. At last, the students were asked to rate interest for passing EBD courses as VAS criteria from 0 to 10.

The data collected by questionnaires were entered into SPSS version 16 software and descriptive analysis and independent *t*-test, one-way ANOVA test, pair *t*-test, Chi-square, and linear regression analysis were used to analyze the data.

Findings

A total of 138 of 168 students completed the questionnaires (response rate = 83.6) who were participated in the study. Their stage of education and response rate were showed separately in Table 1.

The majority of participants (65%, 48/88) were female. Sixty-eight students were resident in students hostages. Most of the respondents (78%) knew about EBD, and 53% of them stated that they learned about it through community dentistry courses. Near half of them (47%) had research experience. Based on chi analysis, there were significant differences ($P = 0.000$) between stage of their educations and their research experiences [Table 2].

Knowledge self-assessment

The mean score of respondents in KSA was 4.3 ± 13 (in the range of 6–36) and 45.5% of students obtained a higher score than the average.

In total, 90% of students reported that they had no or little knowledge regarding critical appraisal skills, and 10% were in an average level. Their least competency was in evaluating statistical tests, and the most one was in assessing general worth of studies. Percentage of different levels of perceived knowledge on critical appraisal is shown in Table 3.

Practice

The mean score of usage of different sources of knowledge showed in as it shows Figure 1. Maximum score belonged to consulting experts.

Table 1: Frequency and response rate of participants based on year of education

Year of education	Number (*n*)	Percentage	RR (%)
4th year	62	45/6	95
5th year	41	30/1	82
6th year (the last year)	33	24/3	71
Total	136	100	81

RR=Response rate

Table 2: Frequency of demographic characteristics of dental students

	Entrance year *n* (%)			Sum
	1386	1387	1388	*n* (%)
Sex				
Woman	15 (45)	14 (34)	19 (31)	48 (35)
Man	18 (55)	27 (66)	43 (69)	88 (65)
Residence				
Nonnative	26 (79)	30 (73)	36 (58)	92 (68)
Native	7 (21)	11 (27)	26 (42)	44 (32)
Familiarity with FBD				
Yes	30 (91)	38 (93)	37 (60)	105 (78)
No	3 (9)	3 (7)	25 (40)	31 (23)
Research work experience				
Yes	21 (70)	25 (68)	10 (19)	56 (47)
No	9 (30)	12 (32)	42 (81)	63 (53)

FBD=Familiarity-based design

Table 3: Percentage of different levels of perceived knowledge on critical appraisal among dental students

	Poor (%) range (6-18)	Average (%) range (24-18)	Good (%) range (36-24)
Assessing study design	65	25	10
Evaluating bias	66	27	7
Evaluating sample size	65	30	5
Assessment of generalizability	67	23	10
Evaluating the statistical tests	72	23	5
Assessing general worth	50	37	13
Total assessment	90	10	0

Usage of four sources of evidence that are known as more valuable sources in EBD (original articles-systematic reviews - EBD guidelines and the Cochrane library) was measured separately (ranged: 0–40). Mean score of using this valuable resource in EBD among students was reported as/16/9 ± 7 and in 51% of individuals using these resources was lower than average. Among these valuable resources, using review articles and original articles was more than two other ones.

The majority of students (76%) studied none or one article per week and only 3.7% read 4–5 articles per week. 34% reported the last time they had studied a paper was in last week.

Actual knowledge on evidence-based dentistry concepts

Mean score of actual knowledge was obtained as 3/2 ± 4/7 (range: 0–11); 40% of individuals were above the average. Only about 4% of students answered all questions correctly.
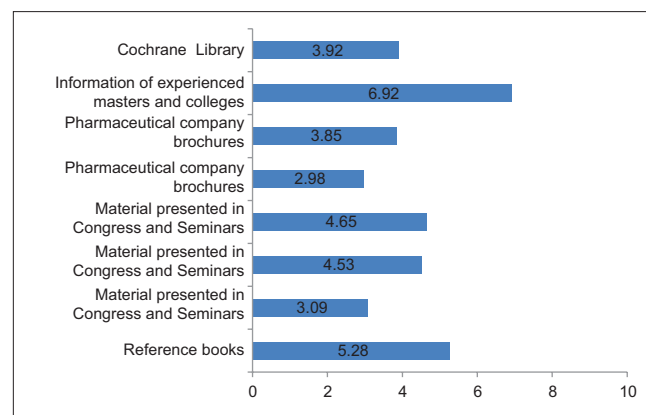
Attitude toward evidence-based dentistry

Based on the results, the mean score of students' attitudes toward EBD was reported as 24 ± 8.3 (range: 36–0), which is categorized in a good level of attitude. The lowest attitude scores were 15 and the highest score was 33; 61% were above the average. About 87% considered themselves as requiring achievement of skills to evaluate their evidence [Figure 2].

The students who were trained in EBD through community dentistry courses had more research experience than the others ($P = 0.005$).

Based on independent *t*-test analysis, there is no significant difference between gender and the mean score of KSA ($P = 32/0$) and practice ($P = 0.397$) and attitude ($P = 0.2$), but the actual knowledge, in women was higher than men ($P = 0.02$).

According to the independent *t*-test, the students who had lived with their family were better significantly in

Figure 1: Mean scores of using each of the various sources of evidence-based dentistry knowledge

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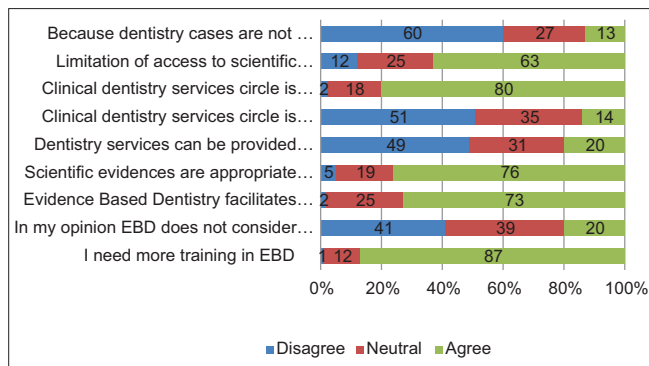
Figure 2: Frequency of students who agree or disagree with each statement in the attitude section about evidence-based dentistry

Table 4: Relationship between different areas of FBD approach in dental students

	Self-assessment knowledge	Practice	Actual knowledge	Attitude
Self-assessment knowledge				
r	1	0.397	0.365	0.290
P		0.000	0.000	0.001
Practice				
r	0.397	1	0.367	0.255
P	0.000		0.000	0.006
Actual knowledge				
r	0.365	0.367	1	0.412
P	0.000	0.000		0.000
Attitude				
r	0.290	0.255	0.412	1
P	0.001	0.006	0.000	

P=Significant/r=Pearson correlation. FBD=Familiarity-based design

Table 5: Factors affecting student practice regard to EBD based on coefficients from multiple linear regression

Predictive variables in practice	B	Significant
Native or hostel	2.55	0.08
Year of education		
Students in 5th year against others	0.411	0
Students in 6th year against others	0.327	0.005
Having research experience	−3.8	0.013
Mean score of self-assessment knowledge	0.175	0.326
Mean score of knowledge	1.05	0.001
Mean score of attitude	−0.024	0.88

EBD=Evidence-based dentistry

actual knowledge ($P = 0.032$) and practice ($P = 0.001$), than students who lived in dormitories. ANOVA test there was no significant difference between mean score of attitude ($P = 0.05$) and actual knowledge ($P = 0.08$), but the students in 5th and 6th year of education had significantly higher self-assessment knowledge and practice than the students in 4th year.

About research work experience, the results showed significant relationship between research experience and all 4 areas subdomains, KSA ($P = 0.000$), actual knowledge ($P = 0.014$), practice ($P = 0.000$), and attitude ($P = 0.016$).

Based on Pearson correlation test, the relationship between the mean scores in all four areas with each other was significant ($P < 0.05$) and the relationship between actual knowledge and attitude was stronger than the other subdomains ($r = 0.41$) [Table 4].

The relationship between interest in participating in training courses with each of four areas of actual knowledge ($P = 0.018$, $r = 0.2$), practice based on EBD ($P = 0.000$, $r = 0.35$), self-assessment knowledge ($P = 0.006$, $r = 0.24$), and attitude ($P = .002$, $r = 0.27$) was direct and statistically significant.

Multiple linear regression analysis was used for assessing, the factors affecting on dental students practice, regard to EBD. According to this regression model, among the factors, research experience with $B = -3.8$, $P = 0.013$ and actual knowledge with $B = 1.05$, $P = 0.01$ up to 35% ($R^2 = 0.35$) can predict the practice of dental students [Table 5].

DISCUSSION

With the aim of determining a standard treatment approach, EBD has been introduced based on changes in therapeutic approach and specific clinical needs in the field of medical sciences. The main steps in applying this approach are determining requirements, searching literature, identifying evidence, and practice based on evidence.[10,11]

The application of EBD is an integral part of medical students' education, especially that of doctors and dentists all over the world. Dental schools are expected to teach their students this approach.[5-8]

The present study assessed the knowledge, attitude, and practices of students of the Isfahan Dental School in relation to EBD. It was found that the self-assessments knowledge among the students was low, and their actual knowledge of EBD left much to be desired; these results are consistent with those obtained in a study by Sabounchi et al.[8] which focused on dental faculty members at dentistry faculties in Iran.

One reason for the difference between self-assessments of knowledge and actual knowledge can be related to the high expectations of students from themselves. Another reason could be the fact that a person does not properly judge his awareness and level of knowledge, and so considers his skills in EBD in clinics as lacking.

The results of this study indicated that all dentistry students were reluctant to use the evidence-based approach and tended to use the experiences and lessons of their own

mentors. Several studies confirm this result.[6,12-17] In a study by Moeintaghavi et al.[16] which examined attitudes toward and the application of EBD among specialized dental assistants at Mashhad University, results demonstrated that, despite being familiar with the EBD approach and having access to evidence-based specialized sites such as Cochrane library, students did not use this approach in their diagnostic and therapeutic procedures; this was confirmed by the results of the present study.

Moeintaghavi et al.[16] also showed that despite high levels of daily Internet use, students searched less for clinical evidence for their patients. Results of a study by Amin et al.[5] are consistent with the findings of the present study and that of Moeintaghavi. Yusof et al.[13] performed a study in Malaysia that showed that most students were not even familiar with the Cochrane library. This indicates that students in Malaysia have a low level of knowledge. In the current study, however, even though students had enough knowledge, they were reluctant to use EBD in the process of clinical diagnosis and treatment.

Easy access to reference books, use of only the clinical experience of mentors, and feeling no need to search scientific databases can be as the rarely use of EBD by Iranian students.[5,16]

It should be noted that while reference books and the experience of mentors are credible resources, they are not up-to-date or sufficient resources for students, and the need to change this attitude seems necessary.

The results of this study are indicative of students' positive attitudes toward achieving EBD skills and their interest in participating in training workshops. These results are consistent with those of previous studies in Iran[7-9] and studies conducted in other countries.[12-14]

Compared to Khami et al., this study found that more students had become familiar with the concept of EBD through community courses and had more knowledge in this field.

Since the community dentistry department provides the issue related in the form of theoretical classes and workshops in the Isfahan Dental School, the higher knowledge of students in Isfahan compared to other colleges is justifiable.

It seems that students more familiar with the use of EBD in their educational curriculum can be effective in enhancing knowledge, attitude, and evidence-based practices.

The results of the present study showed a significant correlation between the four assessed domains that seem perfectly logical because an increase in a person's knowledge of EBD will be accompanied by increased levels of his skill and practice.

Sabounchi et al.[8] and De Vito et al.[17] also obtained the same results about the relationship between different aspects of actual knowledge, self-assessed knowledge, attitudes, number of studies, and interest in participating in courses on evidence-based medical training.

In this study, the knowledge score was higher in women than in men, which is consistent with a study by Khami et al.[7] Because of the differences between the two sexes, more attention should be paid to men in creating incentives and bettering education. Furthermore, the knowledge of native people was more than hostel ones. This difference could be due to the lack of access to computers, the internet, data sources, and EBD workshops and research experience. In the present study, the scores of practice and self-assessments of knowledge in upper grades students showed a significant increase. Furthermore, the difference in attitudes and actual knowledge was at the border of significance and would probably become significant if the sample size were increased. Experience in research work affected all areas of knowledge, practice, and skill.

Reasons for this difference between the different grades can be a higher level of familiarity among individuals with the processes of research and the availability of more training courses, especially in community dentistry, during the final years of study; the need for students to perform research for their academic theses in the last 2 years of study may give them more familiarity, knowledge and practice in EBD. These results are consistent with the study in the United States that investigated self-assessments of orthodontists.[12] The current study also showed that education level, experience in research, knowledge, and actual knowledge are effective in the practices of students; students also have better practice in applying EBD by increasing knowledge and the number of years of education as well as having research experience. These factors can affect their practices up to about 35%. Considering the cut-off point for score of the practice of individuals as two states (poor and acceptable), research experience was eliminated from the determinant factors. It seems quite logical that by increasing the number of years of education as well as learning more about EBD, practice will improve. On the other hand, considering the 35% effect of these factors, it is obvious that, in addition to the currently investigated factors, there are other factors in improving practice that are not discussed in this study. Other factors affecting practice, in spite of a good attitude, were not investigated in this study and addressed in other studies are limited access to international dental journals,[14] inadequate time and access to resources,[18] not enough time to find proper evidence and lack of sufficient skills in judging the quality of evidence[19] and limited training courses in evidence-based medicine.[20]

It is recommended that a broad study be undertaken at the university level in Iran to investigate the various factors related to practice. Another limitation of the current study, that is not investigated were the barriers of using EBD such as enough motivation to change therapeutic processes.[21]

CONCLUSION

Because of the high motivation of students to use evidence-based skills and considering the relatively appropriate knowledge of this group, it is recommended that the context for education at a more practical level of promoting clinical skills in using EBD in dental schools be provided.

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Conflicts of interest

There are no conflicts of interest.

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