

Knowledge, Attitudes, and Barriers toward Evidence-based Dentistry among Moroccan Dental Professionals

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Abstract The aim of the study was to assess Moroccan dental professionals' knowledge and attitudes towards evidence-based practice and investigate their perception toward evidence-based dentistry (EBD) and barriers that compromise its use. A cross-sectional survey was conducted by means of a questionnaire among Moroccan dentists. The questionnaire included questions on demographics data, attitudes, awareness and current practice, resources to guide clinical practice, understanding of terms, clinical situations to assess awareness of EBD and barriers. Quantitative variables were described in terms of numbers and percentages, and qualitative variables were compared using a Chi-square test. A p-value of less than 0.005 was considered significant. 208 participants were invited to take part in the study, corresponding to a response rate of 67.53%. 167 participants were general practitioners (GP) (80.3%) and 40 participants (19.7%) were specialist. 86.5% of the participants were graduates of national dental schools, and 13.5% graduated from other countries. Moroccan dental professionals expressed positive attitudes toward EBD, but a relatively a fair understanding of evidence-based practice. 57.7% of dentists indicated they had never heard of EBD. There were no significant differences between age groups or places of graduation. The most reported means of discovering EBD was through lectures (16.3%), a colleague or the internet (6.7%). Poor language and communication skills and lack of knowledge of information technology were the major barriers identified in this study. To overcome existing barriers and the lack of competencies relevant to dental practitioners, it is essential that EBD be incorporated into dental curriculum and in continuing professional education. Such a curriculum will increase the understanding and use of evidence-based dentistry.

Keywords: *evidence-based dentistry, evidence-based practice, dentist, dentist-patient relations, morocco, health education, dental, problem-based learning*

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1. Introduction

Today, evidence-based dentistry (EBD) is gradually being recognised as the best available research evidence in making efficient clinical decisions. The American Dental Association defines EBD as "an approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating to the patient's oral and medical condition and history, with the dentist's clinical expertise and the patient's treatment needs and preferences" [1,2]. Despite its popularity, EBD remains poorly understood, as many barriers prevent its implementation in clinical practice.

The integration of EBD involves five major steps: (1). to convert a clinical problem into an answerable question, (2). to search for the relevant best available evidence in the literature, (3) to critically assess the validity (degree of reliability) and usefulness (practical feasibility) of the evidence, (4) to translate the evidence into practice based on clinical expertise, and apply the findings reached in clinical practice, (5) to determine whether the application of the best evidence to the patient is consistent with the expected outcomes, and whether it meets the imperatives of clinical ethics.

EBD requires certain skills of dental practitioners, including literature search, and the application of rules of evidence in appraising clinical literature. Acquisition of EBD skills should provide practitioners with the ability to

use available resources and to apply critical thinking skills to respond to a problem. It should also encourage independent learning and foster the development of critical thinking and problem-solving skills. However, the integration of EBD into clinical practice presents many challenges, involving lack of time, inadequate skills, lack of knowledge and financial barriers.

There have been many studies that investigated awareness, attitude and barriers towards evidence-based dentistry [3,4,5]. To date, there is dearth of information regarding Moroccan dental professionals' knowledge and attitudes towards EBD. Hence, the aim of present study was to assess the knowledge and attitude of Moroccan dental professionals toward evidence-based dentistry, and to identify the barriers to implementing EBD in clinical practice

2. Method

A cross-sectional survey was conducted among Moroccan dentists attending the 1st. Moroccan Congress of Moroccan Dental Meeting in Marrakesh in October 2015. All Moroccan dentists working in the public and private sectors were included in the study. Dentists who did not wish to fill out the questionnaire, and non-Moroccan dentists were excluded. A questionnaire pertaining to the use of scientific evidence in orthodontics [6] was used; in some cases, some parts of the questionnaire were modified following guidelines from similar studies [7,8]. The final version consisting 35 items, were divided into 6 domains: demographics data, attitudes/awareness and current practice, resources to guide clinical practice, understanding of terms, clinical situations to assess awareness of EBD and barriers. A pilot study was carried with a sample of 10 residents to create a valid and reliable assessment of the survey. In order to assess the test-retest reproducibility, the questionnaire was administered twice at 2 week-interval to a group of 10 interns and residents. The Kappa coefficient of this questionnaire was calculated to be between 0,737 and 1.

Data collected from the participants' questionnaire were analysed using SPSS software 20. Quantitative variables were described in terms of numbers and percentages, and qualitative variables were compared using a Chi-square test. A p-value of less than 0.005 was considered significant. Test-retest reproducibility was assessed by calculating Kappa coefficients; reproducibility was considered good when the Kappa coefficient was greater than 0.6. Data analysis was performed by Casablanca Medical Informatics Laboratory at Hassan II University.

Approval for conducting the study was obtained from the Research Ethics Committee of Casablanca College of Dentistry. All participants were informed about the purpose of the study. The questionnaires were completed anonymously to ensure the confidentiality of the information provided.

3. Results

A total of 208 of 308 Moroccan dentists completed the questionnaire for a response rate of 67.53%. 144 dentists

(69%) were in the age range of 25-40 years old; 35 (17%) dentists were over 41 years, and only 29 dentists (14%) were under 25 years of age. About 167 participants were general practitioners (GP) (80.3%) obtained their degrees from Moroccan universities, and only 13.5% graduated from universities abroad. The years of graduation ranged between 1987 and 2015 and were grouped into 3 groups relative to the 3 age groups. 69.2% graduated after 1997 and 16.9% had more than 20 years' clinical experience (Figure 1).

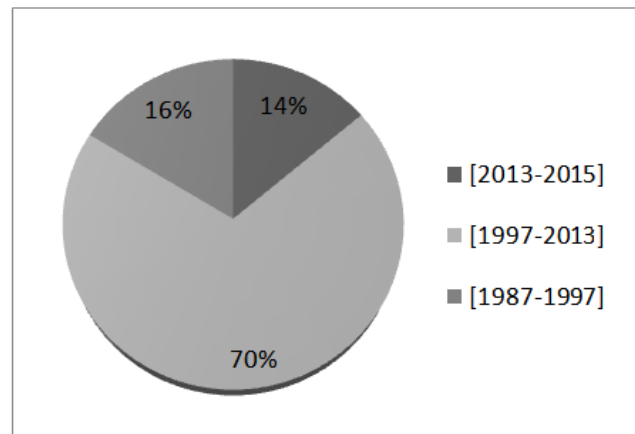


Figure 1. Sample distribution by year of graduation

Out of the total respondents, 57.7% of the survey participants reported to have never heard of EBD before this study. In particular, more GP reported no knowledge of EBD (61.2%) than did dental specialists (42.1%) ($p=0.031$). There were no significant differences between age groups or place of graduation. In addition, the most reported means of discovering EBD was through lectures (16.3%), through a colleague (13%), and through internet search (6.7%). For 71.6% of the respondents, EBD was not a familiar concept. For those who were familiar with the concept, there was no significant difference between age groups ($p=0.939$) or between specialization ($p=0.023$). However, a significant difference between place of graduation was found ($p=0.023$), (Table 1). Dentists who graduated from overseas dental institutions reported receiving more instruction in EBD than did dentists who graduated from Moroccan dental institutions.

When confronting clinical difficulties, 97.6% of participants claimed they looked for a solution and plan the evidence. Concerning the use of the PICO model, (Problem/Population, Intervention, Comparison and Outcome), 20.2% reported that PICO was familiar. Among them, 15.4% claimed the PICO helped them to formulate clinical questions and facilitate literature search, while only 4.8% were completely unaware of the PICO. Over 88% of Moroccan dentists reported reading the literature. In fact, 62.9% indicated that they read scientific articles at least once a month, however, only 4.3% claimed that they did not read any scientific articles. 56.7% identified systematic reviews as the best source for searching the best evidence for clinical questions. For 51.4% of the dentists, reference books were the most frequently used source of information, followed by practical guides (38.5%), and original studies (20.2%). An interest in having more information about EBD was expressed by 82.2% of the participants. The most

commonly reported resource used was the internet (71.6%), followed by continuing education (36.5%), and journals (10.6%). Other means mentioned by the

respondents included scientific meetings and workshops. Approximately 48.5% wanted to know more about EBD, while only 13% did not express an interest (Table 1).

Table 1. Attitudes, awareness and current practices

	understand and could explain it to others	Some understanding	Don't understand but would like to	Don't understand and don't want to	Age	Place of graduation	Field of activity
Factual Dentistry	17%	32%	47%	4%	NS (P=0,625)	NS (P=0,873)	Yes>No (P=0,043)
MedLine	35%	35%	27%	3%	1>2>3 (P=0,047)	NS (P=0,245)	Yes>No (P=0,003)
Systematic Review	40%	31%	26%	3%	NS (P=0,791)	NS (P=0,804)	NS (P=0,574)
RCT	29%	25%	43%	3%	NS (P=0,321)	NS (P=0,571)	NS (P=0,081)
Strengths of Evidence	24%	31%	43%	2%	NS (P=0,740)	NS (P=0,670)	NS (P=0,295)
Meta-analysis	27%	24%	45%	5%	1>2>3 (P=0,085)	Yes>No (P=0,042)	Yes>No (P=0,355)
Cochrane Collaboration	13%	16%	63%	8%	NS (P=0,828)	NS (P=0,530)	No>Yess (P=0,002)

NS, Not significant; RCT, randomized controlled trial; >, more likely to agree with the statement in the question.

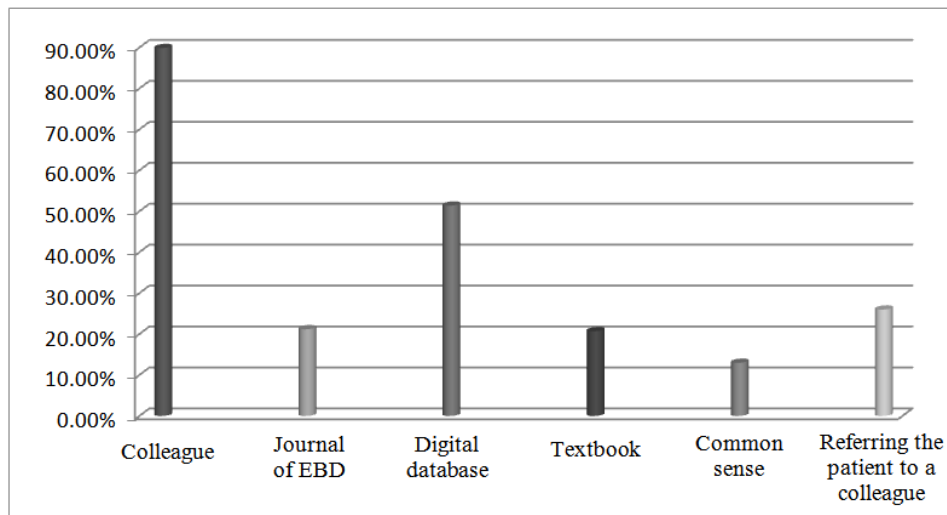


Figure 2. Resource(s) used to guide clinical practice. Age > 25 years; less likely to refer to another dentist (p= 0.041)

Table 2. Resources to guide clinical practice

	Yes	No	Age	Field of activity	Place of graduation
Discovery of EBD during the course of study	42,3%	57,7%	NS (P=0.782)	Yes>No (P=0,031)	NS (P=0,195)
Using the PICO model	20,2%	4,8 %	-	-	-
When in doubt about a clinical situation, you look for an answer...	Always 87%	Sometimes 10,6%	Never 2,4%		
The influence of reading scientific articles on the daily practice of dentists	88%	12%	0%		
Frequency of reading scientific articles	Once a week 29%	1 time/month 34%	Less than once a month 33%		
What source for information?	Systematic Reviews 56,7%	Reference books 51,4%	Practical Guides 38,5%	Original studies 20,20%	Don't read scientific journal 4,3%
Interested or not by more information	Internet 71,6%	Journal 10,6%	Continuing education 36,5%	Others 1%	I'm not interested. 1,4%
Is EBD useful?	Useful 27%	Neutral 4%	Useless 3%	66%	Don't know what it is.

NS, Not significant; >, more likely to agree with the statement in the question.

In terms of learning about the effectiveness of a drug, approximately 32.7% reported searching the MEDLINE database for clinical trials and critical review articles. Almost 29.8% reported checking the opinions of organizations independent of the pharmaceutical industry. 37% indicated that they relied on the information provided by the pharmaceutical representative. Other options mentioned by the respondents were expert and peer review, experience, internet forums, comparison of the effectiveness of medicines on patients and internet search without critical analysis. Furthermore, 89.0% of Moroccan dentists claimed that their most frequent source of information was electronic databases (51.4%), followed by consulting fellow practitioners (26%). This attitude was more adopted by dentists over 25 years of age ($p = 0.041$) (Figure 2). 21.2% of dentists reported consulting a journal of EBD, 20.7% referred to a textbook while 13% relied on their clinical experience (Table 2).

When the participants were asked whether they understood some common terminologies used in EBD, the majority of the respondents reported that they had some knowledge of all terms except "COCHRANE Collaboration"; however, only 13% of Moroccan dentists were able to explain "Cochrane Collaboration". Less than one-third of participants understood and were able to explain EBD, randomized clinical trial, strength of evidence and meta-analysis. However, the majority of participants who reported not understanding these terms expressed an interest in doing so. In addition, specialist dentists were more likely to understand the terms than were GP (Table 3).

In respect of the clinical situations to assess awareness of EBD, we noted the following results (Table 4):

- First situation "Extraction of the mandibular wisdom tooth was necessary to prevent incisor crowding". 63.9% said they disagreed with this statement.
- Second situation, "patients who need to be irradiated for the treatment of cancer of the cervical-facial region, performing extractions after the procedure is safe". Approximately 80.8% of dentists reported that performing extractions on an irradiated field was risky.
- Third situation, "there is limited evidence on the effectiveness of techniques that reduce changes in ridge height and width after 6 months of extraction". This was confirmed by 21.2% of the participants.

- Fourth situation, "sealing of pits and fissures gives better results than topical application of fluoride for the prevention of caries on occlusal surfaces". To prevent cavities on occlusal surfaces, 65.4% of dentists believed that sealing pits and fissures were more effective than topical application of fluoride.
- Fifth situation, "there is good reason to recommend the use of dental floss in combination with brushing to fight gingivitis in adults, but it is not effective in preventing gingivitis in children". About 39.4% of respondents agreed with this statement; 24.5%, however, disagreed.
- Last situation "there is strong evidence that oral health education/ oral health promotion can effectively improve the knowledge of populations". To have maximum impact, this process must be continuous over time. This was confirmed by 87% of the participants.

When the respondents were asked to identify perceived barriers to EBD, the majority of participants (68.3%) claimed that the most commonly reported barrier was ambiguous and conflicting literature, followed by financial constraints (61.1%), and lack of specific language skills to evaluate articles (50.50%). In fact, 48.10% stated that they were not familiar with critical evaluation of scientific resources, and 38% reported having difficulty in evaluating the level of evidence. Lack of time was also seen as a barrier to the use of EBD for 37.50% of the respondents. 36.50% of Moroccan dentists reported not having access to full published research articles, while 26.90% noted that EBD required communication and information literacy and was considered unnecessary in practice by 34.60% of the sample, and a threat to the clinician's autonomy and experience by 29.30% of the participants.

Of the dentists participating in the present study, 42.8% expressed their dissatisfaction with their EBD knowledge. Specialist dentists were more likely than GP to consider EBD as a threat to their clinician's autonomy and previous experience ($p=.005$). To address these barriers, 64.4% of participants endorsed the provision of easily understandable protocol summaries, 62% endorsed the adoption of an evidence-based curriculum that would help stimulate dentists to implement EBD into their daily practice, while journal clubs and peer review sessions were chosen by 26% of participants as a means to optimize the incorporation of EBD into the practice of dentists.

Table 3. Understanding of terms

	Age			Place of graduation		Field of activity	
	< 25 y	25-40 y	> 41 y	Moroccan	Foreign	G	Specialist
Colleague advice	82,8%	92,4% P=0,195	85,7%	88,9% P=0,218	85,7%	90% P=0,922	89,5%
Journal of EBD	13,8%	23,60% P=0,406	17,1%	21,10% P=0,969	21,4%	21% P=0,673	23,7%
Electronic database	41,4%	55,60% P=0,204	42,9%	52,8% P=0,329	42,9%	50% P=0,379	23,70%
Manual	24,1%	19,40% P=0,800	22,9%	21,10% P=0,692	17,9%	21% P=0,705	18,4%
Relying on common Sense	6,9%	11,80% P=0,126	22,9%	12,80% P=0,825	14,3%	12% P=0,270	18,40%
Referring the patient to a colleague	6,9%	29,20% P=0,041	28,6%	24,40% P=0,20	35,7%	25% P=0,642	28,9%

Table 4. Clinical situation to assess awareness of EBD

	agree	neutral	disagree
Extraction of the mandibular wisdom tooth is necessary to prevent overlapping of the incisors.	16%	20%	64%
For patients who need to be irradiated for the treatment of cancer of the cervical-facial region, performing extractions after the procedure is safe.	4%	15%	81%
There is limited evidence on the effectiveness of techniques that reduce changes in ridge height and width after 6 months of extraction.	21%	61%	18%
Sealing of pits and fissures gives better results than topical application of fluoride for the prevention of caries on occlusal surfaces.	65%	24%	11%
There is good reason to recommend the use of dental floss in combination with brushing to fight gingivitis in adults, but it is not effective in preventing gingivitis in children.	39%	36%	25%
There is strong evidence that oral health education/ oral health promotion can effectively improve the knowledge of populations. To have maximum impact, this process must be continuous over time.	87%	9,10%	3,8%

4. Discussion

The present study targeted Moroccan dental practitioners with the objective to assess their awareness on evidence based dental practice, overall attitude and perceived barriers towards it. The majority of the participants had a positive attitude towards EBD though a significant number of participants had never heard of it.

The response rate of the present study was 67.53% similar to McColl et al (67%) [9], and Iqbal's et al. study (69.6%) [7], but more than the study of Yusof et al [5], which indicated response rates between 32% and 50.3%. This rate was seen as a considerable achievement, especially that response rates to questionnaires from physician surveys were declining. About 69.2% of the total participants had clinical experience between 3 and 19 years while 17% had working experience of more than 20 years. This was higher than the results of Iqbal et al., in which the majority of the participants had 15 years of clinical experience [7].

In Malaysia, [5] more 36.8% of the respondents had working experience for at least twenty years or more.

In terms of place of graduation [10], 86.5% of the respondents graduated from a national university, while the remaining 13.5% graduated from universities abroad. A study conducted in Malaysia indicated that 59.1% graduated from universities abroad.

A study conducted in Malaysia indicated that 59.1% graduated from local universities, while the other participants graduated from countries such as Australia, England, India, Singapore, Indonesia, Taiwan and New Zealand [5]. When the dentists were asked whether they had heard of EBD before, 57.7% of participants reported to have never heard of EBD and that EBD was not currently a part of their dental curricula. This finding was in agreement with previous studies. For example, McColl et al. [9], found that more than a third of their participants received training in critical appraisal. Similarly, Al-Motairy et al. found that a quarter of the physicians in Saudi Arabia received some formal training in evidence-based medicine and critical appraisal [11]. In fact, Morris et al. claimed that clinicians who did not receive any formal training in EBD generally lacked adequate knowledge and skills to seek out information [10]. In their study, 48.6% of students had completed an evidence-based practice module [10]. In a cross-sectional study in Iran, it was found that a majority indicated that EBD was a decision-making process based on scientifically approved evidence and allowed dentists to

improve their clinical knowledge and skills. Nevertheless, 46.5% stated that all evidence from all articles published in systematic reviews can be used in EBD [3]. It is clear that without better current evidence, medical practice risks become outdated to the detriment of the judicious care of the patient [9].

When the participants were asked whether they understood some common technical terms used in EBD, a majority of the respondents reported some or no understanding of 7 out of 9 terms related to EBD. This finding was in line with previous studies. For instance, a study conducted by the American Association of Orthodontists [1], found that most respondents had some or no understanding of 6 out of 10 terms used in the evidence-based literature. Similarly, participants in McColl's study demonstrated a partial understanding of technical terms used in evidence-based medicine [9]. Similar to results in Saudi Arabia [11], and Iran [3], participants in these studies reported a lack of familiarity with terms related to evidence-based practice. In their study involving Iranian dentists, Navabi reported that EBD was not a familiar concept to the Iranian dentists [3]. In Malaysia, [5] however, the percentages of understanding of 'evidence-based dentistry', 'systematic review', and 'critical appraisal' were 80%, 71% and 61.5%, respectively. Note that these rates were higher than those obtained in Iran [3], and in our study (17.3%). Given the complexity of determining the meaning of the concept by respondents, it appeared that participants were familiar with EBD rather than with understanding. It is possible that the respondents wanted to give a good impression rather than declare their true attitude, despite the anonymity of the study. It so happened that a quarter 24% of our respondents believed that EBD was a practice, based solely on good quality research evidence.

Although a few participants reported being able to define EBD terms, the majority showed some understanding, or a desire to know more about EBD. Initiatives that promote the practice of EBD could therefore be promising, especially since almost half of the participants found EBD useful and almost all expressed an interest in having more information on the topic. Thus, we noted that the vast majority of Moroccan dentists participating showed a positive attitude towards EBD. A study conducted in Saudi Arabia [11], also noted a positive and supportive attitude of its participants on this subject.

With regard to clinical practice, our respondents stated that they sought answers to their clinical questions by reading scientific articles. Nevertheless, it appeared that

reading was not a daily routine for the majority of our participants, this may be due to the limited time practitioners devoted to this activity. The participants in our study were divided into three thirds, with the first third reading scientific articles once a month, the other third reading less than once a month and just under a third reading scientific articles once a week. Hadley et al [12], reported that 19.9% of their sample read medical articles more than once a week, 38.2% read regularly each week to stay up-to-date, a quarter read once every 1-2 weeks, and the rest read less frequently or not at all. To the question "how many hours per week do you use a website to promote your knowledge of dentistry?", 42.8% of Iranian dentists indicated they read less than once a week and only 0.8% read more than 10 hours a week [3]. In this regard, Davidoff et al. suggested that one should read scientific articles every day to keep up with current medical literature, and they indicated that the average number of articles to be read was 17 [13].

Addressing a clinical problem through evidence-based practice involves asking a searchable and answerable question about it. Nevertheless, what helps us to do effective research is to know how to phrase our question correctly. To help us formulate this question, Sackett et al. advised structuring it into 4 main criteria in an acronym PICO [14]. This model was used by 15.4% of respondents, and only 20.2% were familiar with it. Even when compared to the U.S, the survey of orthodontists, found that only 6% had an understanding of what PICO was [6].

A large proportion of participants' responses agreed with the best current evidence for 4 out of 6 clinical situations:

- There was no significant association between third molar impact and lower anterior tooth crowding to justify wisdom tooth extraction to prevent incisor crowding.
- There was good reason to recommend the use of flossing in combination with brushing to control gingivitis in adults. Not effective in the prevention of gingivitis in children.
- There was evidence that oral health education/promotion can be effective in bringing about changes in people's knowledge. This process must be continuous for maximum effect. However, there was weak evidence that increased knowledge leads to improved behavior.
- There was limited evidence on the effectiveness of techniques that reduced changes in ridge height and width after 6 months of extraction.
- For patients who needed to be irradiated for the treatment of cancer of the cervico-facial region, performing extractions after the procedure was at risk. "It is accepted that teeth with a questionable prognosis may be removed prior to irradiation. Extractions should be atraumatic ... Extractions during and after radiotherapy should be sparing and medically supervised". Factors contributing to osteoradionecrosis include "extractions after radiation therapy without precaution".
- Fluorinated topicals were reported to be more effective on smooth carious surfaces than on fissure and fissure surfaces. Pits sealing remains the most effective preventive treatment at this level.

In several studies [5,6,7], conducted among general dental practitioners, a low level of familiarity with evidence based practice was found. Most dentists in our study consulted fellow practitioners when faced with clinical uncertainties. This source of information was the most frequently chosen because it was fast, did not involve any financial means, and provided support and guidance as well as other psychological benefits that computerized sources could not provide. However, it was a biased source of information and represented a conflict of interest [6]. There were also the opinions of experts, which, despite their experience, could also be a source of bias. Indeed, Choudhry et al. demonstrated that practitioners with a long practice had a lower quality of care than novice practitioners [15]. In addition, an Iranian study identified the sources used by dentists to solve a clinical problem, in descending order: textbooks, colleagues, followed by electronic databases, and finally own judgment and personal experience [3]. In Malaysia, too, almost half, 45.2% reported continuing treatment without seeking evidence, based on their own judgement and experience [5]. In our study, 13% relied on their common sense when faced with a clinical issue. A study conducted by Richard et al. [16] identified the 3 most frequent actions taken by dentists when faced with clinical uncertainty. These included asking a colleague for advice, referring the patient to a colleague and consulting manuals. Like our study and studies conducted in other countries, a few participants also reported using textbooks. This can be problematic as textbooks were often published with adjournments. Practitioners should consult an electronic database (PubMed, Cochrane...) and find evidence in systematic reviews and meta-analyses. However, these were not always accessible and may not discuss the clinical issue. In England, for instance, only 2% consulted an electronic database. This was due to the fact that this source was not easily accessible and did not necessarily discuss all subjects [7]. At the same time, the difficulty of accessing complete published research articles was an obstacle detected in our study. O'donnell's study found that all practitioners had easy access to electronic databases [17]. Further, the findings revealed that most dentists showed a keen interest in EBD. Although the respondents seemed to value EBD, they appeared to face a number of challenges. Ambiguous and the conflicting nature of the literature was the most frequently noted barrier, followed by lack of time, which made it difficult for practitioners to identify the most appropriate answer to a clinical question. Dentists may not have enough time to detect the information, to reliably discriminate trustworthy from untrustworthy sources.

Several studies were conducted to identify the barriers involved in implementing EBD. For example, Spallek et al. identified lack of recent evidence, lack of clear answers to clinical questions, and contradictory information in the scientific literature as major barriers [8]. This was quite similar to the findings of Smedt et al. who claimed that although his participants had a positive attitude, they reported the overwhelming mass of literature and difficulties of integrating evidence into practice as the most common obstacles [18].

When Moroccan respondents were asked to identify perceived barriers to EBD, the most commonly reported

barrier was poor language and communication skills, followed by lack of knowledge of information technology. With respect to comfort with evaluating research findings and integrating evidence and research findings into practice, our participants reported difficulty in assessing the level of evidence and in conducting critical analysis. A study by Bhattacharya et al. [19] reported a low level of confidence in evaluating research studies among health care practitioners and allied health professionals. The participants were then asked about whether EBD was a threat to their autonomy, 10.1% 13% felt that the concept was a threat to clinical freedom.

To overcome existing barriers and the lack of competencies relevant to dental practitioners, it is essential that EBD be incorporated into dental curriculum and in continuing professional education. 62% believed that the integration of EBD into dental curriculum would help future dentists to adopt EBD in their clinical practice. This initiative was advocated by the majority of practitioners in Belgium [18]. EBD requires dentists to learn new skills beyond those traditionally taught in medical schools, an initiative considered time-consuming. As reported in Rawat et al.'s study, 72.4% of academicians felt that lack of time was one of the major perceived barriers and about 50.7% of academicians believed that learning EBD skills would help them to use EBD on a daily basis [4].

It was hypothesized that there may be a relationship between dentists' attitudes towards EBD and demographic characteristics, namely age, place of graduation and field of practice.

This work allowed us to empirically verify this relationship. Dental specialists in our study had a better understanding of the terms "MedLine" and "Cochrane Collaboration" than did GP. They were also more likely to see EBD as a threat to their clinical autonomy and experience. In Saudi Arabia [11], it was found that physicians practicing a specialty had a more positive and supportive attitude towards evidence-based practice and were fully aware of the influence of research on daily practice. This difference in the perception of EBD between specialist and GP was also noted by Rabe et al. who studied the attitude, awareness and perception of EBD by dental professionals in Halland, Sweden [20]. In addition, specialist dentists indicated a higher level of comfort in assessing scientific information. None of them reported being uncomfortable at all with incorporating the best current evidence into their practice. The same was true for the choice of source to retrieve information on a new procedure: Specialists were more likely to choose electronic databases to search the best facts. This finding was not in line with Alison and Bedos' study which indicated that it was rather the specialist dentists who did not find the research easily accessible [21].

With respect to location of training and age, we noted no significant differences between the participants' responses. In Iran [3] and Malaysia [5] they did not establish any relationship between participants' knowledge, age, gender and number of years since graduation. Nevertheless, although recent graduates had a part of their dental training devoted to the values and skills of evidence-based decision-making, they, nevertheless, did

not report an increase in comfort level in accessing or implementing research compared to graduates of previous decades.

5. Limitations

Some of the dentists did not have the time to fill out questionnaires. Our study, therefore, focused on Moroccan dentists who attended the 1st. Moroccan Congress of Moroccan Dental meeting in 2015, a population already aware of the need to update their evidence-based knowledge. Non-response bias may also be of a concern; we had no way to verify whether the knowledge, attitudes and behaviors of respondents were different from those of non-respondents. Nevertheless, it was possible that the true attitudes of consciousness, current practice and understanding of the terms, and the attitudes reported, may have been different.

Despite the anonymity of the study, it was possible that respondents may have wanted to give a good impression rather than declare their true views on the subject. To address these limitations, we are planning a follow-up study based on a representative sample of dentists to assess their awareness, attitudes and perceived challenge of barriers identified in this research. However, this study was able to identify the positive attitudes of dentists towards EBD, and thus to identify suggestions that could optimize the practice of this concept. By overcoming barriers and applying scientific evidence in their daily practice, dentists should be able to meet the greatest challenge: the delivery of effective quality oral care.

6. Conclusion

The purpose of this study was to assess Moroccan dentists' awareness of EBD and overall attitude and identify perceived barriers towards it. The majority of the participants expressed positive attitudes towards EBD. However, awareness of the Cochrane was low, and understanding of evidence-based practice terminology was relatively average. Most respondents turned to electronic databases (51.4%) and consulted fellow practitioners when faced with clinical issues. Lack of language and communication skills, followed by lack of knowledge of information technology were the major barriers identified in this study. With respect to comfort with evaluating research findings and integrating evidence and research findings into practice, Moroccan dentists reported difficulty in assessing the level of evidence and in conducting critical analysis.

To overcome existing barriers, it is essential that EBD be incorporated into dental curriculum and in continuing professional education. This step may be crucial in delivering effective and efficient dental care to the patients. Finally, identification of barriers may help to develop an evidence based curriculum for all dental professionals with a view to enhance their awareness, understanding, and use of it to search for the best available evidence in the literature, to deliver the care patients need.

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Disclosure Statement

The authors declare they have no conflict of interest.

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