# Participants in this study

The previous web-based questionnaire was conducted in Japan and Brazil between December 2021 and June 2022. By the end, 136 dentists in Japan and 111 dentists in Brazil had participated. The table below presents the characteristics of the participants. The mean numbers of years after graduation from dental school were approximately 19 in Japan and approximately 16 in Brazil. Dentists in Japan were mostly male, with 84% male and 16% female, while those in Brazil were mainly female, with 29% male and 71% female.

Looking at all dentists in the two countries, it is true that male dentists are more numerous in Japan and female dentists are more numerous in Brazil. (Sources: Japan; Ministry of Health Labour and Welfare. Survey of Physicians, Dentists and Pharmacists in 2020. Brazil; Morita et al., Current profile and trends of Brazilian dentists, Dental Press, 2010.)

	Japan	Brazil
	(n=136)	(n=111)
	Mean value ± standard	Mean value ± standard
	deviation or N (%)	deviation or N (%)
Mean numbers of years after	18.5±13.7	16.1±11.3
graduation from dental school		
Gender		
Male	114 (83.8%)	32 (28.8%)
Female	22 (16.2%)	79 (71.2%)
Type of practice		
Employed by another dentist	44 (32.4%)	30 (27.5%)
Self-employed	71 (52.2%)	52 (47.7%)
Public dental care facility	21 (15.4%)	27 (24.8%)
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Table: Participant Characteristics in Japan and Brazil

# Please read the following questions (Q1-3) that you answered in the

previous questionnaire and read the commentary.

#### Q1: Restoration diagnosis and treatment

[Scenario] The patient is a 30-year-old female with no relevant medical history. She has no complaints and is in your office today for a routine visit. She has been attending your practice on a regular basis for the past 6 years. Except for the teeth in the photos below, the patient has no dental restorations, no dental caries, and is not missing any teeth.



Question 1: What is the lesion depth at which you think it is best to transfer from preventive therapy to a permanent restoration (e.g., composite resin)? Please choose the one that is most applicable to your opinion among the 5 photos above.

0	Case 1
0	Case 2
0	Case 3
0	Case 4
0	Case 5

#### Q2: Deep caries diagnosis and treatment

[Deep Caries Patient Scenario]

[Deep Carles Patient Scenario] Patient Edwards is a 25-year-old male with a visible cavitation into the dentin in the central fossa of tooth #30 (right mandibular first molar according to the ADA coding system). Overall patient Edwards has just two enamel lesions on smooth surfaces, in addition to the lesion on #30, which the bitewing radiograph indicates is deep. The tooth responds to cold and the pain lasts < 3 seconds. The bitewing radiograph of the tooth #30 is shown below.



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Question 2: Upon opening the tooth and during excavation of the caries, you realize that the lesion is deeper than anticipated and may involve the mesial buccal pulp horn. In this situation, what would you usually do?

0	Continue and remove all the decay.
0	Stop removing decay near the pulp horn and remove it elsewhere.
0	Perform endodontic treatment or refer to an endodontist

#### Q3: Caries risk assessment

Question 3: Do you assess caries risk for individual patients in any way?

	YES (If YES, please specify how you assess caries risk)	
	/	
0	NO	

## Results of bilateral international comparison

In this research, we assessed Evidence-Practice Gap (EPG) through three questions (Q1-3) concerning Minimal Intervention Dentistry (MID). The concordance between evidence and actual practice are as shown below.

	Japan Concordance (n=136)	Brazil Concordance (n=111)	P-value*
Q1	63% (86/136)	73% (81/111)	0.136
Q2	81% (110/136)	75% (83/111)	0.317
Q3	68% (93/136)	<mark>91%</mark> (99/109)	P<0.001
Percentage in concordance	38% (51/136)	<mark>56%</mark> (62/111)	0.00592
for all 3 questions			

\*Chi - squared test

International comparisons between the two countries using the chi-square test showed that Brazil was statistically significantly higher than Japan for the "concordance for Q3 (conducting caries risk assessment)" (p<0.001) and the "concordance for all three questions" (p<0.01). Concordance was significantly higher in Brazil (56%) than in Japan (38%) for all three questions, indicating that the evidence-practice gap (EPG) may be larger in Japan than in Brazil in the practice related to MID measured here.

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Please read the following question (Q4) that you answered in the previous questionnaire and read the commentary.

Q4 Information sources for evidence

Question 4:

When you seek to answer a question you have in your clinical practice, how frequently do you use the information sources listed below to obtain necessary information? (For each item, please choose <u>the one</u> that is best applicable to your case.)

4: frequently, 3: sometimes, 2: rarely, 1: never

	4	3	2	1
1. Colleague	0	0	0	0
2. Textbook	0	0	0	0
3. Non-academic Journal	0	0	0	0
4. Internet information sources (e.g., websites, blogs)	0	0	0	0
5. Scientific journal articles in non-English language	0	0	0	0
6. Scientific journal articles in English	0	0	0	0
7. Clinical Practice Guideline	0	0	0	0
8. Seminars and workshops	0	0	0	0

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### Bilateral International comparison of information sources for evidence

Sources of evidence and their frequency were evaluated using the questions in Q4 above. For each source of information, respondents who answered "frequently" or "sometimes" were analyzed as "obtaining information". The following are the results of a bilateral international comparison of the percentage of dentists using the chi - square test.

Information sources for evidence	Percentage of dentists obtaining information Japan (n=136)	Percentage of dentists obtaining information Brazil (n=111)	P-value*
Colleague	82% (111/136)	81% (90/111)	1
Textbook	92% (125/136)	71% (78/110)	P<0.001
Non-academic Journal	67% (91/136)	21% (22/107)	P<0.001
Internet information sources (e.g., websites, blogs)	62% (84/136)	58% (63/108)	0.680
Scientific journal articles in non-English language	66% (90/136)	57% (62/108)	0.204
Scientific journal articles in English	49% (66/136)	82% (89/109)	P<0.001
Clinical Practice Guidelines	79% (107/136)	74% (80/108)	0.489
Seminars and workshops	86% (117/136)	57% (61/107)	P<0.001

\*Chi-squared test

Information was obtained from "Textbook", "Non-academic Journal", and "Seminars and workshops" more often in Japan than in Brazil (p<0.001), while information was obtained from "English-language journal articles" more often in Brazil than in Japan (p<0.001).

Regarding English-language journal articles, which are considered the most important source for obtaining the latest evidence, the percentage of respondents in Japan who obtained evidence from English-language articles was 33% significantly lower than that in Brazil. Therefore, the EPG in Japan could be improved by creating an environment that facilitates the use of evidence from English-language articles by clinical dentists.

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These questions concern English-language journal articles.

1. Which methods do you use to obtain English-language journal articles? (Multiple answers allowed)

Searching on PubMed (https://pubmed.ncbi.nlm.nih.gov/)

□ Searching repositories in the libraries of universities etc.

□ Subscription to specific English-language academic journals

□ Other (Please specify:

□ I have never obtained English-language journal articles.

2. Do you experience any difficulties when searching for English-language journal articles on

PubMed (<u>https://pubmed.ncbi.nlm.nih.gov/</u>)?

I Yes (Proceed to question 2-1)

□ No

□ I have never used PubMed

2-1. For those who selected "Yes" to the question above:

What aspects do you find difficult? Please choose from the options below (multiple answers allowed).

□ It is difficult to search in English.

 $\Box$  It is difficult to use the site.

□ Other (Please specify:

3. Do you experience any difficulties when reading English-language journal articles?

□ Yes (Proceed to question 3-1)

□ No

□ I have never read English-language journal articles.

3-1. For those who selected "Yes" to the question above:

What aspects do you find difficult? Please choose from the options below (multiple answers allowed).

□ It is difficult to read text in English.

□ It is difficult to understand the content of journal articles (study design, statistical analysis, etc.).

□ Other (Please specify:

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4. Have you ever read an English-language journal article concerning a systematic review / meta-analysis (a research design to systematically collect existing literature evidence and draw comprehensive conclusions) in order to answer a clinical question?

□ Yes

□ No

5. Please select one of the following that best describes your use of web-based translation tools (Google Translate, DeepL, etc.) when reading English-language journal articles.

 $\hfill\square$  I use them now, and am satisfied with the results of translation into my mother tongue.

□ I use them now, but am not satisfied with the results of translation into my mother tongue.

□ I have used them in the past, but do not use them now, because I was not satisfied with the results of translation into my mother tongue.

□ I do not use web-based translation tools because I can read English-language journal articles without them.

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□ I do not use them because I have never read English-language journal articles.

□ Other (Please specify:

6. What improvements do you think should be made to help clinical dentists in your country to read English-language journal articles? Select all applicable responses. (Multiple answers allowed)

Pre-university English education

Education on how to obtain and read English-language journal articles at dental schools

□ Continuing education on how to obtain and read English-language journal articles after graduation from dental schools

□ Usability of English-language journal article search websites (PubMed, etc)

□ Performance of web-based translation tools (Google Translate, DeepL, etc.)

□ Other (Please specify:

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Please read the following question (Q5) that you answered in the previous questionnaire and read the commentary.

Q5. Major causal factors of EPG

Check the one response which you consider the most applicable from among the 20 potential causes of EPG.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. Insufficient knowledge of how to obtain evidence such as quidelines, scientific papers, etc.	0	0	0	0	0
<ol> <li>Insufficient knowledge of how to evaluate the quality of scientific papers or the evidence level.</li> </ol>	0	0	0	0	0
3. Insufficient case reports in which evidence-based dentistry (EBD) is applied to clinical practice.	$\odot$	0	0	0	0
4. Insufficient opportunity to learn about evidence in dental education at universities.	0	0	0	0	0
5. Insufficient opportunity to learn about evidence after graduation from universities.	0	0	0	0	0
6. Image-based information and devices used for diagnosis vary depending on individual dentists.	0	0	0	0	0
7. Dentists' own thoughts are sometimes given priority over evidence.	0	0	0	0	0
8. Dentists' own experiences are sometimes given priority over evidence.	0	0	0	0	0
9. Even though dentists understand the evidence, they want to avoid the risks associated with changing the treatment they have used so far.	0	0	0	0	0
10. Dentists have insufficient time to keep up-to-date on evidence in areas other than their own specialty area.	0	0	0	0	0
11. Evidence-based treatments are sometimes not covered by the dental insurance system.	0	0	0	0	0
12. Insufficient time to thoroughly explain and obtain the patient's understanding of an evidence-based treatment	0	0	0	0	0

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strategy.					
13. Dental practice revenues are sometimes given priority over	$\bigcirc$	$\bigcirc$	$\bigcirc$	0	$\bigcirc$
evidence when deciding treatment strategy.					
14. Considering the reputation of the clinic, even non-evidence-	0	$\bigcirc$	$\bigcirc$	0	$\bigcirc$
based methods may be used to ensure that symptoms such as					
pain are removed.					
15. The nation and society as a whole do not recognize the	$\bigcirc$	$\bigcirc$	$\bigcirc$	0	$\bigcirc$
importance of EBD.					
16. Evidence-based treatment does not always agree with the	$\bigcirc$	$\bigcirc$	$\bigcirc$	0	$\bigcirc$
patient's need.					
17. Potential overtreatment may be a concern for patients who	$\bigcirc$	$\bigcirc$	$\bigcirc$	0	$\bigcirc$
do not make regular visits for dental checkups; in these					
patients, follow-up observation cannot be performed.					
18. Insufficient evidence which helps dentists choose an	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	0
appropriate treatment for a patient after careful consideration of	f				
his/her own background.					
19. Evidence-based treatment cannot be proposed to patients	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
who do not have a good understanding of evidence.					
20. Depending on the patient, evidence cannot be always	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
prioritized because treatment does not always proceed					
smoothly, as indicated by evidence.					

## Results of bilateral international comparison

The results are shown below, sorted from highest to lowest in terms of the percentage of dentists who agreed with each item, with "strongly agree" and "agree" being analyzed as "agreed" in the response to Q5 above.

_			Percentage of
	Rank	Japan (n=136)	dentists who
			agreed (%)
	1	Q8: Dentists' own experiences are sometimes given priority over evidence.	88
	2	Q7: Dentists' own thoughts are sometimes given priority over evidence.	80
	3	Q11: Evidence-based treatments are sometimes not covered by the dental insurance system.	76
	4	Q16: Evidence-based treatment does not always agree with the patient's need.	75
	5	Q5: Insufficient opportunity to learn about evidence after graduation from universities.	74
	6	Q2: Insufficient knowledge of how to evaluate the quality of scientific papers or the evidence level.	72
	7	Q20: Depending on the patient, evidence cannot be always prioritized because treatment does not always proceed smoothly, as indicated by evidence.	71
	8	Q14: Considering the reputation of the clinic, even non-evidence-based methods may be used to ensure that symptoms such as pain are removed.	69
	9	Q1: Insufficient knowledge of how to obtain evidence such as guidelines, scientific papers, etc.	63
	10	Q9: Even though dentists understand the evidence, they want to avoid the risks associated with changing the treatment they have used so far.	62
	11	Q17: Potential overtreatment may be a concern for patients who do not make regular visits for dental checkups; in these patients, follow-up observation cannot be performed.	60
	12	Q10: Dentists have insufficient time to keep up-to-date on evidence in areas other than their own specialty area.	59
	12	Q18: Insufficient evidence which helps dentists choose an appropriate treatment for a patient after careful consideration of his/her own background.	59
	14	Q15: The nation and society as a whole do not recognize the importance of EBD.	57
	15	Q4: Insufficient opportunity to learn about evidence in dental education at universities.	54
	15	Q12: Insufficient time to thoroughly explain and obtain the patient's understanding of an evidence-based treatment strategy.	54
	17	Q19: Evidence-based treatment cannot be proposed to patients who do not have a good understanding of evidence.	53
	18	Q3: Insufficient case reports in which evidence-based dentistry (EBD) is applied to clinical practice.	52
	19	Q6: Image-based information and devices used for diagnosis vary depending on individual dentists.	51
	20	Q13: Dental practice revenues are sometimes given priority over evidence when deciding treatment strategy.	48

Rank	Brazil (n=111)	Percentage of
i vanik		agreed (%)
1	Q2: Insufficient knowledge of how to evaluate the quality of scientific papers or the evidence level.	85
2	Q8: Dentists' own experiences are sometimes given priority over evidence.	84
3	Q7: Dentists' own thoughts are sometimes given priority over evidence.	80
4	Q1: Insufficient knowledge of how to obtain evidence such as guidelines, scientific papers, etc.	73
5	Q9: Even though dentists understand the evidence, they want to avoid the risks associated with changing the treatment they have used so far.	70
6	Q15: The nation and society as a whole do not recognize the importance of EBD.	67
6	Q13: Dental practice revenues are sometimes given priority over evidence when deciding treatment strategy.	67
8	Q17: Potential overtreatment may be a concern for patients who do not make regular visits for dental checkups; in these patients, follow-up observation cannot be performed.	64
9	Q6: Image-based information and devices used for diagnosis vary depending on individual dentists.	58
10	Q20: Depending on the patient, evidence cannot be always prioritized because treatment does not always proceed smoothly, as indicated by evidence.	53
11	Q11: Evidence-based treatments are sometimes not covered by the dental insurance system.	49
12	Q5: Insufficient opportunity to learn about evidence after graduation from universities.	48
13	Q4: Insufficient opportunity to learn about evidence in dental education at universities.	47
14	Q14: Considering the reputation of the clinic, even non-evidence-based methods may be used to ensure that symptoms such as pain are removed.	46
15	Q3: Insufficient case reports in which evidence-based dentistry (EBD) is applied to clinical practice.	43
16	Q18: Insufficient evidence which helps dentists choose an appropriate treatment for a patient after careful consideration of his/her own background.	37
17	Q19: Evidence-based treatment cannot be proposed to patients who do not have a good understanding of evidence.	33
18	Q16: Evidence-based treatment does not always agree with the patient's need.	32
19	Q10: Dentists have insufficient time to keep up-to-date on evidence in areas other than their own specialty area.	31
19	Q12: Insufficient time to thoroughly explain and obtain the patient's understanding of an evidence-based treatment strategy.	31

In Japan, the top two responses were "Q8. Dentists' own experiences are sometimes given priority over evidence" and "Q7. Dentists' own thoughts are sometimes given priority over evidence", in that order, suggesting that the main causal factor of EPG is that dentists prioritize their own ideas and experience.

"Q11. Evidence-based treatments are sometimes not covered by the dental insurance system" was in third place, suggesting that early recognition of evidence-based treatments by the insurance system would be important for improving EPG.

"Q16. Evidence-based treatment does not always agree with the patient's need",

concerning matching with patient needs was in fourth place, and "Q5. Insufficient opportunity to learn about evidence after graduation from universities", concerning continuing education about evidence, was in fifth place.

In Brazil, on the other hand, "Q2. Insufficient knowledge of how to evaluate the quality of scientific papers or the evidence level" and "Q1. Insufficient knowledge of how to obtain evidence such as guidelines, scientific papers, etc." were in first and fourth place, respectively. These suggest that the main causal factor of EPG is that clinical dentists do not know how to obtain evidence and how to assess its quality.

Also, "Q8. Dentists' own experiences are sometimes given priority over evidence", "Q7. Dentists' own thoughts are sometimes given priority over evidence", and "Q9. Even though dentists understand the evidence, they want to avoid the risks associated with changing the treatment they have used so far" were in second, third, and fifth place, respectively, suggesting that in Brazil, as in Japan, the major causal factor of EPG is the prioritization of dentists' own experiences and ideas over the evidence.

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Please read the following question (Q6) that you answered in the previous questionnaire and read the commentary.

Q6. What do dentists want to ask society to do in order to improve EPG?

Question 6: Do you have anything you want to ask society (e.g., the national government, universities, scientific societies, dentistry-related associations) to do in order to improve the EPG in your country?

0	YES (If YES, please specify)		
0	NO		

The results of Q6 are shown below.

	Percentage of dentists who would like			
	society to do something to improve EPG			
Japan (n=136)	<b>66% (90/136</b> )			
Brazil (n=107)	56% (60/107)			

More than half of dentists in both Japan and Brazil indicated that there are things they would like society to do to improve EPG. We performed a qualitative analysis on free descriptive comments in which dentists stated "what dentists specifically want to ask society to do in order to improve EPG" in both countries. Analysis of 112 comments from dentists in

Japan and 72 comments from dentists in Brazil identified the following seven categories in common between Japan and Brazil.

## Things dentists in Japan and Brazil want to ask society to do in order to improve EPG: Seven categories identified through qualitative analysis

1. Encourage dental research that is useful to clinical practice and disseminate its findings

2. Establish an environment in which it is easier for dentists to obtain evidence.

3. Review the insurance system and reimbursement to enable the practice of evidencebased dentistry

4. Develop the ability to provide evidence-based dentistry in dental education at dental schools.

5. Develop and disseminate easy-to-understand clinical practice guidelines

6. Enhance continuing education programs to enable dentists to practice evidence-based dentistry

7. Inform the nation about the evidence and the importance of oral health

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Please answer the following questions, based on the commentary on the preceding page.

Select three options from the following which you believe should be prioritized as measures to improve EPG in your country.

Encourage denta	al research that is	useful to clinical	practice and dis	seminate its findings
Lincourage denie	a i cocai chi that is	a userur to cirricar	practice and us	seminale its infulligs

 $\hfill\square$  Establish an environment in which it is easier for dentists to obtain evidence.

□ Review the insurance system and reimbursement to enable the practice of evidence-based dentistry

□ Develop the ability to provide evidence-based dentistry in dental education at dental schools.

□ Develop and disseminate easy-to-understand clinical practice guidelines

Enhance continuing education programs to enable dentists to practice evidence-based dentistry

□ Inform the nation about the evidence and the importance of oral health

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Please feel free to describe any comments, opinions or impressions you may have concerning this study in the box below (optional).



The questionnaire is now completed. Please click the [Submit] button to finalize your response.

Back	Submit
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