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Use of clinical practice guidelines by dentists: findings from the Japanese dental practice-based research network

Naoki Kakudate, DDS, PhD, MPH^{1,2}, Yoko Yokoyama, MPH, PhD³, Futoshi Sumida, DDS⁴, Yuki Matsumoto, DDS⁵, Valeria V Gordan, DDS, MS, MS-Cl⁶, and Gregg H Gilbert, DDS, MBA, FAAHD, FICD⁷

¹Professor and Director, Division of Clinical Epidemiology, Kyushu Dental University, Kitakyushu, Fukuoka, Japan

²Visiting Professor, University of Florida College of Dentistry, Gainesville, FL, USA

³Project Assistant Professor, Graduate School of Media and Governance, Keio University, Fujisawa-city, Kanagawa, Japan

⁴Dentist, Mikami Dental & Orthodontics Clinic, Tomakomai, Hokkaido, Japan

⁵Director, Matsumoto Dental Clinic, Okazaki, Aichi, Japan

⁶Professor, Department of Restorative Dental Sciences at the University of Florida College of Dentistry, Gainesville, FL, USA

⁷Professor & Chair, Department of Clinical and Community Sciences, School of Dentistry, University of Alabama at Birmingham, Birmingham, AL, USA

Abstract

Aims—The objectives of this study were to: (1) examine differences in the use of dental clinical practice guidelines among Japanese dentists, (2) identify characteristics associated with the number of guidelines used by participating dentists.

Methods—We conducted a cross-sectional study consisting of a questionnaire survey in Japan between July 2014 and May 2015. The study queried dentists working in outpatient dental practices who are affiliated with the JDPBRN (n=148). They were asked whether they have used each of 15 Japanese dental clinical guidelines. Associations between the number of guidelines used by participants and specific characteristics were analyzed via negative binomial regression analysis.

Results—The mean number of guidelines used by participating dentists was 2.5 ± 2.9 (SD). Rate of use of guidelines showed substantial variation, from 5% to 34% among dentists. The proportion of dentists that used guidelines was the highest among oral medicine specialists, who had the highest proportion for 10 of 15 guidelines. Negative binomial regression analysis identified three

Corresponding author: Naoki Kakudate, DDS, MPH, PhD, Professor and Director, Division of Clinical Epidemiology, Kyushu Dental University, Address: 2-6-1, Manazuru, Kokura-kita, Kitakyushu, Fukuoka, 803-8580, Japan, Phone: +81-93-285-3022 FAX: +81-93-285-3170; r13kakudate@fa.kyu-dent.ac.jp.

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factors significantly associated with the number of guidelines used: “years since graduation from dental school”, “specialty practice”, and “practice busyness”.

Conclusions—These results suggest that the use of clinical practice guidelines by Japanese dentists may still be inadequate. Training in the use of the guidelines could be given to dental students as undergraduate education and to young clinicians as continuing education.

Keywords

clinical guidelines; evidence-based medicine; health service research

INTRODUCTION

Evidence-based care involves the integration of best evidence, patient preference and clinical judgment when making a treatment decision, and is now considered the “gold standard” in the delivery of health care [1]. The evidence pyramid displays the quality of evidence according to the type of study. Clinical practice guidelines are at the top of this evidence pyramid and offer clinicians a simplified mechanism for obtaining and potentially using the knowledge identified in this pyramid [2]. Clinical practice guidelines are statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options [3]. Standardizing the level of treatment and enhancing the quality of dental care should be aided by practitioners’ use of clinical practice guidelines.

Although a wide variety of guidelines has been developed, guidelines have had limited effect on changing physician behavior [4–6]. Potential barriers to physician guideline adherence include awareness, familiarity, agreement, self-efficacy, outcome expectancy, ability to overcome the inertia of previous practice, and absence of external barriers to implementing the recommendations [4]. In addition, physicians’ adherence to guidelines can vary with guideline content or practice specialty [4]. In Japanese dentistry, currently there are more than 15 dental clinical guidelines [7–21]. To be consistent with the concept of evidence-based care, Japanese dentists should make use of as many clinical practice guidelines as are applicable to the areas of clinical care that they provide to their patients. However, use of dental clinical practice guidelines has not been measured in Japan.

Therefore, the objectives of this study were to examine differences in the use of dental clinical practice guidelines by Japanese dentists, and identify characteristics associated with the number of guidelines used by dentists.

METHODS

Study Design

We conducted a cross-sectional study consisting of a questionnaire survey in Japan between July 2014 and May 2015. This study was approved by the Ethics Committee of Kyushu Dental University (IRB protocol No. 13-73) in full accordance with the World Medical Association Declaration of Helsinki.

Participants

The Dental Practice-Based Research Network Japan (JDPBRN) [22] is a consortium of dental practices with a broad representation of practice types, treatment philosophies, and patient populations. It has a shared mission with the U.S. National Dental PBRN to investigate research questions and share experiences and expertise [23]. The network regions of the JDPBRN represent all seven districts of Japan (Hokkaido, Tohoku, Kanto, Chubu, Kansai, Chugoku-Shikoku, and Kyushu). Each region has a Regional Coordinator, who distributed and gathered the questionnaires. Dentists were asked to complete the questionnaire by hand and return it to the assigned Regional Coordinator in a pre-addressed envelope. Upon receipt, the Regional Coordinator reviewed the questionnaire for completeness [24].

Study subjects were dentists working in outpatient dental practices who were affiliated with the JDPBRN (n=148). Participants were recruited from the JDPBRN website and mailings. They were asked whether they had used each of the 15 dental clinical guidelines in current use [7–21]. All participants provided written informed consent prior to participation in the study.

Outcome Measurement

In this study, “use of dental clinical guideline” is the main outcome of interest. We asked the participants to select the dental clinical guidelines which they use out of a total of 15 guidelines [7–21].

Statistical Analysis

We determined the number and percentage of dentists for each question. Regarding practice busyness, practices were asked to self-report according to the following classification: “too busy to treat all people requesting appointments” or “provided care to all, but the practice was overburdened” (re-categorized as “busy”), or “provided care to all, but the practice was not overburdened or “not busy enough” (re-categorized as “not busy”). Negative binomial regression analysis was performed to examine the association between the number of guidelines used and specific characteristics for independent variables. Coefficients were calculated together with the 95% confidence intervals (CIs). All statistical analyses were performed with STATA/SE® version 13 (STATA Corp.; College Station, TX, USA). Statistical significance was set at $p < 0.05$.

RESULTS

Demographic information of participants

Questionnaires were distributed to 148 dentists, and 112 (76%) responses were collected. Participants represented all seven districts of Japan (Hokkaido, Tohoku, Kanto, Chubu, Kansai, Chugoku-Shikoku, Kyushu). Demographic characteristics of the study participants are shown in Table 1. Mean age (SD) and years since graduation from dental school was 44 ± 11 and 23 ± 11 years, respectively. Participants were predominantly male (N=91, 83%), and all were Asian by race/ethnicity. Although all had reported doing at least some restorative dentistry, only 35% (N=38) reported being general dentists.

Number of guidelines used by participating dentists

The mean number of guidelines used by participating dentists was 2.5 ± 2.9 (SD). A histogram of these data is shown in the Figure. The negative binomial regression model was selected to account for the overdispersion of the outcome variable.

Rates of use of the dental clinical practice guidelines

Rates of use of the dental clinical practice guidelines are shown in Table 2. “Guideline for dental caries treatment (n=37, 34%)”, followed by “Clinical practice guidelines for periodontitis patients with diabetes (n=32, 29%)”, were rated as the most frequently used guidelines, whereas “Guidelines for intravenous sedation in dental practice (n=5, 5%)” and “Guidelines for the deglutition disorders treatment” (n=5, 5%)” were rated as the least frequently used. When dentists were classified by specialty, the proportion of dentists that used guidelines was the highest among oral medicine specialists, who had the highest proportion for 10 of 15 guidelines.

Factors affecting the decision to use clinical practice guidelines

The results of negative binomial regression analysis are shown in Table 3. Three factors were significantly associated with the number of guidelines used by participating dentists. Coefficients (CI) were “years since graduation from dental school”, 0.02 (0.002-0.04), “specialty practice”, 0.71 (0.23-1.18), and “practice busyness”, 0.51 (0.07-0.95).

DISCUSSION

The results of the study showed that the rates of use by participants of clinical practice guidelines, which were developed by the relevant Japanese dental societies, ranged from a low of 5% to 34%, suggesting that use of the guidelines is far from prevalent in dental practice in Japan. Negative binomial regression analysis suggested that years since graduation from dental school, busyness, and specialty practice were associated with the use of clinical practice guidelines.

Regarding the years since graduation from dental school, the study result showed that the rate of use of the clinical practice guidelines significantly increased with years since graduation. This suggests that dentists better understand the importance of the guidelines and use them with increasing clinical experience.

The result on busyness showed that busier dentists tended to use the clinical practice guidelines more often. This result is consistent with previous analyses of dental practice patterns [25, 26], which also demonstrated that busier dentists are more likely to practice evidence-based dentistry.

With regard to the results on specialty practice, the study result showed that the dentists with specialty training would use guidelines more than those without specialty training. When dentists were classified by specialty, the proportion of dentists that used guidelines was highest among oral medicine specialists, who had the highest proportion for 10 of 15 guidelines, although the total number of oral medicine dentists was small (n=8). One

possible reason is that their practice includes the association of the oral disease with systemic disease, requiring an understanding of various kinds of guidelines.

Previous studies have revealed that physician adherence to guidelines can be hindered by a variety of barriers, such as awareness, familiarity, agreement, self-efficacy, outcome expectancy, ability to overcome the inertia of previous practice, and absence of external barriers to implementing the recommendations [4]. The current study adds to this literature by measuring guideline use among dentists in Japan and by suggesting that “years since graduation from dental school”, “specialty practice (whether or not specialist)”, and practice busyness are related to guideline use.

This study featured a relatively wide variety of participants, with respondents from all over Japan. The age and gender distribution of this study sample was similar to the actual distribution in Japan [27], thereby enhancing the generalizability of the findings. However, this study has several limitations. First, participants were not selected by random sampling. Second, given the cross-sectional nature of our study, causative relationships between factors and a dentist’s decision to use clinical practice guidelines were difficult to assess.

Gaps between evidence and practice exist [28–32]. Improving this situation may be aided by the wide dissemination of the clinical practice guidelines. Our results suggest that young clinical dentists should be advised to use the guidelines, and trained in their use as a component of continuing education. Dental students should be educated on the benefit of systematic evidence-based dentistry, including the use of guidelines, as part of their dental education.

CONCLUSION

These results suggest that the use of clinical practice guidelines by Japanese dentists remains inadequate. Evidence-based dentistry education, which includes the use of guidelines, should be provided to dental students as part of their undergraduate education and to young clinicians as continuing education.

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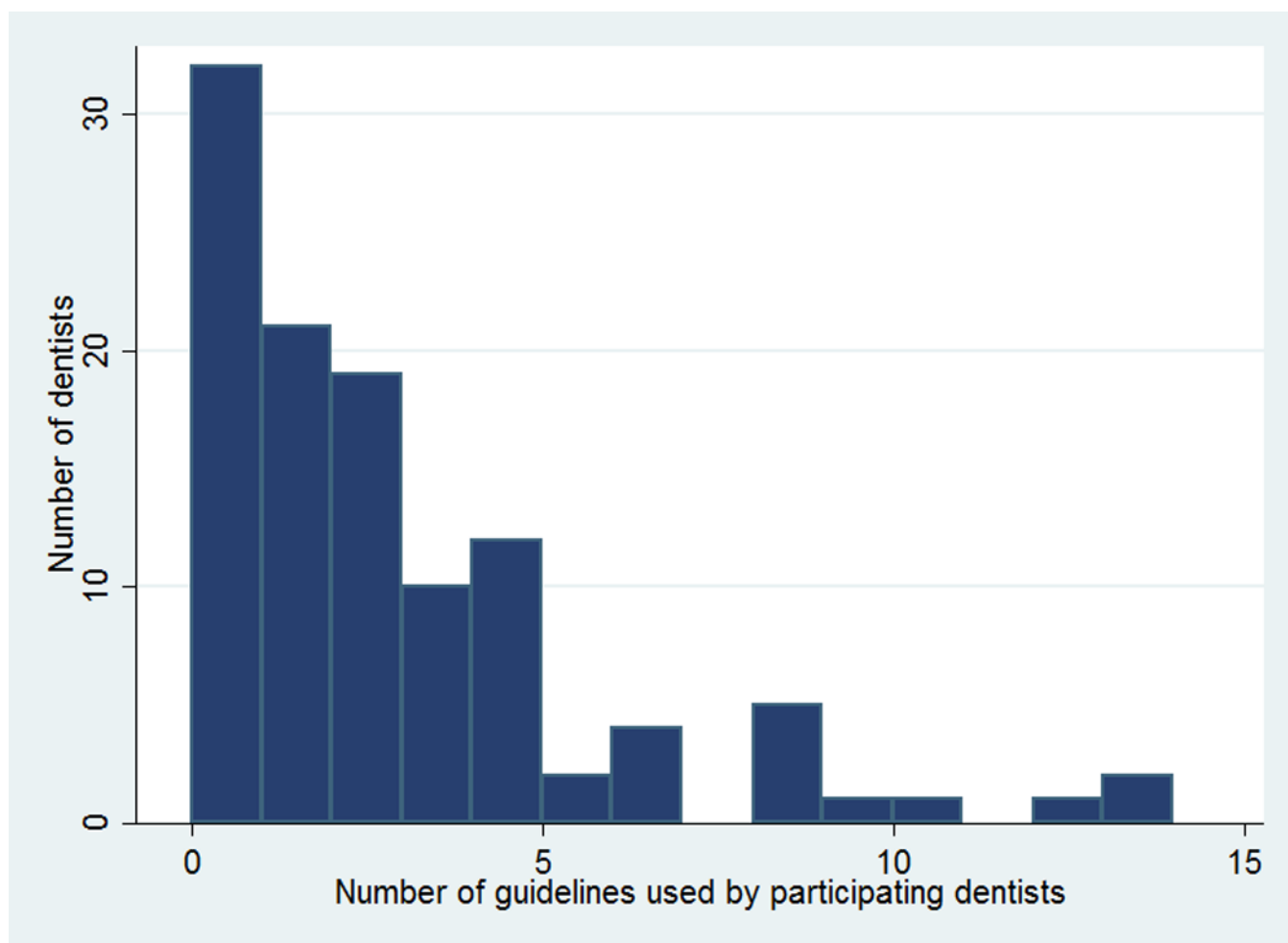


Figure.

Table 1

Distribution of dentist, practice, and patient characteristics (N=112)

	Number (%) or Mean±SD
Dentist Characteristics	
<i>Age (years)* (N=109)</i>	44±11
<i>Years since graduation from dental school</i>	23±11
<i>Gender (male) (N=109)</i>	91 (83%)
<i>Race/ethnicity, n (%) (N=109)</i>	
Asian	109 (100%)
White	0 (0)
Native Hawaiian or Other Pacific Islander	0 (0)
<i>Area of specialty, n (%) (N=109)</i>	
None (General Practitioner)	38 (35%)
Prosthodontist	38 (35%)
Oral surgeon	31 (28%)
Periodontist	22 (20%)
Pedodontist	19 (17%)
Conservative Dentistry	17 (16%)
Endodontist	15 (14%)
Orthodontist	10 (9%)
Oral medicine	8 (7%)
Other	4 (4%)
Practice Setting	
<i>Practice busyness, n (%) (N=108)</i>	
Too busy to treat all people requesting appointments	15 (14%)
Provide care to all, but the practice is overburdened	50 (46%)
Provide care to all, and the practice is not overburdened	33 (31%)
Not busy enough	10 (9%)
<i>City population (>700,000), n (%) (N=108)</i>	40 (37%)
<i>Type of practice, n (%) (N=109)</i>	
Employed by another dentist	45 (41%)
Self-employed without partners and without sharing of income, costs, or office space	43 (39%)
Self-employed without partners but share costs of office and/or assistants, etc.	8 (7%)
Self-employed as a partner in a complete partnership	6 (6%)
Other	7 (6%)
Patient Population	
<i>Gender (male) (%)* (N=109)</i>	43±9
<i>Patient age distribution 65 years (%)* (N=108)</i>	28±17

* Mean±SD

Table 2

Rates of use of the dental clinical practice guidelines

Clinical Practice guideline use (N=110)	Total Number (%)	Proportion of the dentists with area of specialty		
		1 st (%)	2 nd (%)	3 rd (%)
1. Dental caries treatment (The Japanese Society of Conservative Dentistry)	37 (34%)	Pedodontist (42%)	Oral Medicine (38%)	General Practitioner (37%)
2. Periodontitis patients with diabetes (Japanese Association for Dental Science)	32 (29%)	Oral Medicine (63%)	Orthodontist (40%)	Periodontist (36%)
3. Antimicrobial therapy to the patients with periodontal disease (Japanese Society of Periodontology)	31 (28%)	Periodontist (55%)	Oral Medicine (50%)	Endodontist (47%)
4. Antithrombotic therapy requiring dental extraction (Japanese Society of Dentistry for Medically Compromised Patient, Japanese Society of Oral and Maxillofacial Surgeons, and Japanese Society of Gerodontology)	28 (26%)	Oral Medicine (50%)	Oral Surgeon (39%)	Conservative Dentistry (29%)
5. Primary treatment of temporomandibular disorders (The Japanese Society for Temporomandibular Joint)	24 (22%)	Oral Medicine (50%)	Prosthodontist (37%)	Periodontist (36%)
6. Removable Prosthodontic treatment (Japanese Prosthodontic Society)	18 (16%)	Prosthodontist (32%)	Endodontist (27%)	Oral Medicine (25%)
7. Image Diagnosis in Implant Dentistry (Japanese Society for Oral and Maxillofacial Radiology)	16 (15%)	Oral Medicine (38%)	Pedodontist (21%)	Orthodontist (20%)
8. Palatal Augmentation Prosthesis to the eating, deglutition, and articulation disorders (Japanese Prosthodontic Society)	15 (14%)	Oral Medicine (38%)	Conservative Dentistry (29%)	Periodontist (27%)
9. Prosthodontic treatment (Japanese Prosthodontic Society)	15 (14%)	Oral Medicine (25%)	Prosthodontist (21%)	Oral Surgeon (16%)
10. Oral cancer treatment (Japanese Society of Oral Oncology, and Japanese Society of Oral and Maxillofacial Surgeons)	12 (11%)	Oral Medicine (50%)	Oral Surgeon (32%)	Endodontist (13%)
11. Oral appliances for obstructive sleep apnea (The Japanese Academy of Dental Sleep Medicine)	12 (11%)	Oral Medicine (25%)	Periodontist (18%)	Prosthodontist (16%)
12. Antiinflammatory analgesics in joint pain of TMD (Japanese Society of Oral Therapeutics and pharmacology)	10 (9%)	Oral Medicine (50%)	Oral Surgeon (23%)	Periodontist (14%)
13. Non-odontogenic toothache treatment	8 (7%)	Oral Medicine (25%)	Oral Surgeon (19%)	Periodontist (9%)

Clinical Practice guideline use (N=110)	Total Number (%)	Proportion of the dentists with area of specialty		
		1 st (%)	2 nd (%)	3 rd (%)
(Japanese Society of Orofacial Pain)				
14. Intravenous sedation in dental practice (The Japanese Dental Society of Anesthesiology)	5 (5%)	Oral Surgeon (7%)	Pedodontist (5%)	Prosthodontist & General Practitioner (3%)
15. Deglutition disorders treatment (The Oto-Rhino-Laryngological Society of Japan)	5 (5%)	Periodontist (9%)	Prosthodontist (8%)	Oral Surgeon (3%)

Table 3

Factors affecting dentist decision to use clinical practice guidelines

Variable	Coefficient	Standard Error	95% CI		p value
			Lower	Upper	
Gender (reference male)	0.33	0.28	-0.21	0.87	0.227
Years since graduation from dental school *	0.02	0.01	0.002	0.04	0.033
Specialty practice (reference: none)	0.71	0.24	0.23	1.18	0.004
Practice busyness (reference: not busy)	0.51	0.22	0.07	0.95	0.023
Percentage of patients aged over 65 years (%) *	0.0034	0.0066	-0.0096	0.016	0.612

CI, confidence interval

Pseudo $R^2=0.05$

* Continuous variable