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Gender differences in practice patterns for diagnosis and treatment of dental caries: Findings from The Dental PBRN

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Abstract

Objectives—A number of articles have addressed gender differences in the productivity of dentists, but little is known about differences in practice patterns for caries management. This study compared the use of a comprehensive range of specific diagnostic methods, preventive agents, and restorative decision making for caries management between male and female dentists who were members of The Dental Practice-Based Research Network(DPBRN).

Methods—This study surveyed general dentists who were members of DPBRN and who practiced within the United States. The survey asked about dentist, practice, and patient characteristics, as well as prevention, assessment, and treatment of dental caries. Differences in years since dental school graduation, practice model, full/part-time status, and practice owner/employee were adjusted in the statistical models, before making conclusions about gender differences.

Results—Three hundred ninety-three male (84%) and seventy-three female (16%) dentists participated. Female dentists recommended at-home fluoride to a significantly larger proportion of their patients, whereas males had a preference for using in-office fluoride treatments with pediatric patients. Female dentists also choose to restore interproximal lesions at a significantly later stage of development, preferring to use preventive therapy more often at earlier stages of dental caries. There were few differences in diagnostic methods, time spent on or charges for restorative dentistry, and busyness of their practices.

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The DPBRN Collaborative Group comprises practitioner-investigators, faculty investigators, and staff members who contributed to this DPBRN activity. A list of these persons is at http://www.dpbrn.org/users/publications/Default.aspx

Conclusion—DPBRN female dentists differ from their male counterparts in some aspects of the prevention, assessment, and treatment of dental caries, even with significant covariates taken into account. Practice patterns of female dentists suggest a greater caries preventive treatment philosophy.

Keywords

Caries; Prevention; Fluoride; Female; Practice patterns; Sealant; Adult; Pediatric; Radiographs; Caries risk assessment

1. Introduction

As is true for other professions, an increasing number of women are entering the practice of dentistry. In 1990, women constituted approximately 12% of practicing dentists, and it has been projected for 2010 that women will account for 22% of all practicing dentists (1). Furthermore, the proportion of women graduates of dental schools in the United States (US) was up to 44% in 2008, suggesting there may be even greater proportions of female dentists in future years (2).

Many articles have addressed issues of productivity, with the subtle implication that male dentists provide more dental care, and therefore serve the needs of the community to a greater extent than female dentists. These studies report that women dentists have lower incomes, work less hours per week, see fewer patients, and are more likely to work part-time (3–11). Fewer studies have reported specifically on female dentists' clinical decision patterns. A report about Australian dentists by Brennan found higher rates of caries prevention used by female dentists (12); however, Atchison (6) did not find gender differences in services that were grouped into a single category of "sealants/fluoride varnish/ topical varnishes." The Brennan study did not find gender differences for general categories of diagnostic or restorative treatment(12). These studies combined specific services into higher-order categories for each area of service provided, so inferences about preferences for one treatment or preventive method over another are not possible. Studies of female physicians show greater attention to the preventive aspects of patient care (13,14).

Scientific findings have supported a shift towards greater use of prevention and more-conservative management of caries by dental practitioners (15–19). Considering that on average, female dentists are younger and are more-recent graduates (5,12,20), we would expect to find that as a group they may be using more caries prevention and a more-conservative management approach to caries consistent with current recommendations. Understanding these practice patterns are particularly relevant as the treatment of dental caries is the most common procedure performed by general dentists (21).

To our knowledge, no study has compared the use of a comprehensive range of diagnostic methods, preventive agents, and restorative decision making for caries management between male and female dentists. We have such an opportunity with the data from the current study, in which we survey dentist practitioner-investigators in The Dental Practice-Based Research Network (DPBRN). The aim of this study was to test the hypothesis that, with key covariates already taken into account, female dentists 1) use caries prevention agents in a larger percentage of their patients, 2) prioritize caries risk factors differently, 3) practice caries risk assessment differently, 4)use different caries diagnostic techniques, and 5) make restorative decisions using restorative case scenarios that are more-conservative than male dentists.

2. Population and methods

2.1. Network Dentists

The DPBRN is a consortium of participating practices and dental organizations committed to advancing knowledge of dental practice and finding ways to improve it. DPBRN mainly comprises dentist practitioner-investigators in five regions: Alabama/Mississippi; Florida/Georgia; dentists employed by HealthPartners and private practitioners in Minnesota; Permanente Dental Associates in cooperation with Kaiser Permanente Center for Health Research; and Denmark, Norway, and Sweden (22). Participants of DPBRN were recruited through continuing education courses and mass mailings to licensed dentists from the participating regions.

DPBRN has a wide representation of practice types, treatment philosophies, and patient populations, including diversity with regard to the race, ethnicity, geography and rural/urban area of residence of both its practitioner-investigators and their patients (23). The DPBRN dentists, while intended to draw on a diverse geographical area and practice types, are not a random sample. However, we have demonstrated that they have much in common with dentists at large, and in fact the only characteristic that was statistically different from American Dental Association survey data was the number of years since graduation from dental school (23).

The main objective of the use of the “DPBRN Enrollment Questionnaire” was to provide estimates of the frequency of key characteristics of DPBRN dentists with the goal to develop a pool of 200 dentists who would be appropriate for inclusion in subsequent studies envisioned for the DPBRN. To develop this pool of about 200 dentists, a target of at least 300 to complete the Enrollment Questionnaire was set. Ultimately, that number was exceeded by having more than 500.

2.2. Procedure

As part of enrollment in DPBRN, all practitioner-investigators completed an Enrollment Questionnaire about their practice characteristics and themselves. An “Assessment of Caries Diagnosis and Caries Treatment” questionnaire was sent to DPBRN dentists who reported in the Enrollment Questionnaire doing at least some restorative dentistry. A pilot study documented comprehension and item test-retest reliability across 15 days using a sample of 35 network dentists. All items in the final version met a test-retest reliability cutoff of kappa > 0.7. These questionnaires are available at http://www.dpbrn.org/users/publications/Supplement.aspx. Practitioner-investigators were asked to return the questionnaire within three weeks, with a second reminder sent after an additional three weeks.

2.3. Use of caries preventive agents

The following selected questions queried use of preventive agents: For adults; of patients more than 18 years old with at least one posterior tooth, for what percentage do you: Apply dental sealants on the occlusal surfaces of at least one tooth? Administer an in-office fluoride application, such as fluoride gel, fluoride varnish, or fluoride rinse? Recommend a non-prescription (over-the-counter) fluoride rinse? Provide a prescription for some form of fluoride? Recommend an at-home regimen of Chlorhexidine rinse? For children; of patients 6 to 18 years old for what percentage do you: Apply dental sealants on the occlusal surface of at least one of their permanent teeth? Administer an in-office fluoride application, such as fluoride gel, fluoride varnish, or fluoride rinse? Recommend a non-prescription (over-the-counter) fluoride rinse? Provide a prescription for some form of fluoride?

2.4. Caries risk assessment and caries-related diagnostic methods

Items asked about the importance of caries risk factors and the use of caries risk assessment and are presented in Table 1 and Table 2 respectively. Questions administered about the frequency of caries-related diagnostic methods are listed in Table 3.

2.5. Restoration cases scenarios

Dentists were asked to select the treatment codes they would recommend for each of a set of five radiographs of interproximnal and occlusal lesions that varied on lesion severity/depth (Figure 1). Each set of radiographs also had accompanying clinical scenarios that described patients of low and high caries risk. The interproximal series also had a pediatric case scenario. The scenarios are described in Figure 1. Treatment codes categorized as conservative/preventive were: no treatment today, follow the patient regularly; instruct the patient in plaque removal for the affected area; in-office fluoride; prescription fluoride; recommend non-prescription fluoride; use sealant or unfilled resin over the tooth; chlorhexidine treatment. Codes categorized as repair/replace were: polish, resurface, or repair restoration but not replace; replace entire restoration. When multiple codes were selected, the treatment was scored as “repair/replace” if either of the repair or replace restoration codes were endorsed. Each of the clinical scenarios were initially scored based on the least severity/depth (see Figure 1)at which the dentist would first select to restore the lesion rather than perform only preventive therapy. Because of small cell sizes, E1/E2 and D2/D3 were collapsed and the level for restoration was recoded as E1/E2=1, D1=2, and D2/D3=3.

These five scores(occlusal/low-risk scenario; occlusal/higher-risk scenario; pediatric occlusal; interproximal/low-risk; interproximal/higher-risk) reflect a treatment continuum based in lesion severity/depth, and were used to create a variable we refer to as the “restoration index” for each of the five scenarios. A higher restoration index means that the dentist intervenes surgically on lesions of greater depth, and is consistent with a more-conservative caries treatment philosophy for each case.

2.6. Practice variables

The “years since dental school graduation” variable was created by subtracting the reported year of graduation from the year the survey was completed. Practices were characterized by “type of practice” for each dentist as being in either: (1) a solo or small group private practice (SPP); (2) a large group practice (LGP); or (3) a public health practice (PHP). “Small” practices were defined as those that had 3 or fewer dentists. Public health practices were defined as those that receive the majority of their funding from public sources.

2.7. Statistical methods

The general linear model (GLM) was used to test for dentist gender differences in the percentages of patients receiving each caries treatment(hypothesis 1). Logistic regression was used to test for differences in the priority given to each of the caries risk factors (hypothesis 2) once the rating of importance was dichotomized to allow comparisons between very or extremely important with less important categories (not at all, slightly or moderately important). Differences in caries risk assessment and individualized caries prevention (hypothesis 3) were tested using GLM for parametric models and logistic regression for dichotomous responses. GLM was also used to test for differences in the frequency of use of specific diagnostic methods for caries(hypothesis 4). Differences in the restoration index as a function of patient risk and lesion site were tested using generalized estimating equations to adjust for multiple responses from each dentist(hypothesis 5).

Males were coded=0 and females=1. Years since graduation, practice type (LGP/PHP=0, SPP=1), part-time practice (32+hours=0, less than 32 hours=1), and practice ownership (not owner/partner=0, owner/partner=1) were adjusted in all statistical models to ameliorate bias related to different training experiences or practice situations that may account for gender differences in practice patterns. The presence of two-way interactions between gender and both years since graduation and practice type were also tested and where significant, separate models by gender were used to interpret the interaction effects.

A "DPBRN region" variable was also created, but multicollinearity with the practice type variable precluded using both in the same regression model. Statistical models were tested substituting the region variable for the practice type variable with no substantive differences in the results. All tables and figures show adjusted means. Analysis was performed using SPSS 16.0 (24).

3. Results

A total of 932 DPBRN dentist practitioner-investigators were eligible, of whom 534 responded, for an overall return rate of 58 percent. There were no participation differences by gender or years since dental school graduation. This study reports on the 466 practitioner-investigators who reported performing non-implant restorative treatment, practiced within the United States, and were general dentists. Dentists from the Scandinavian region were excluded because of potential differences in practice patterns associated with greater prevention orientation of these countries (25). Dentist, patient, and practice characteristics are presented in Table 5. There were no gender differences in the race/ethnicity of the dentists. Female dentists were more-recent graduates from dental school ($p < .001$), and were more likely to be working part-time ($p = .002$). However, when only full-time dentists were considered, there were no differences in the number of patients seen each week by male or female dentists. Male and female dentists were distributed equally across the three practice models, but female dentists were less likely to be a practice owner or partner ($p < .001$). There were no gender differences in the number of days a patient waited for an examination appointment or treatment appointment. Male and female dentists treated an equal proportion of pediatric and geriatric patients. There were no differences in the percentage of time spent on restorative treatment, the fees charged for a 2-surface amalgam, or the percentage of patients with dental insurance.

3.1. Preventive agents

Figure 2 presents the percentages of pediatric patients who received various preventive agents by network dentists(hypothesis 1). Female dentists were significantly more likely to have recommended an at-home regimen of non-prescription fluoride (adjusted means; male, 30%, female, 36%; $\beta = 5.932$, $p = .041$) on pediatric patients than male dentists. Male dentists were significantly more likely to have applied an in-office fluoride (male, 86%, female, 78%; $\beta = -7.673$, $p = .015$) than female dentists. In addition, a significant gender × graduation year interaction resulted, in that a negative association between years since graduation and the frequency of the use of in-office fluoride on pediatric patients was only significant for female dentists ($\beta=1.156$, $p = .013$). There were no gender differences for recommending a prescription fluoride regimen or having applied a dental sealant. Readers are reminded that in this context, the interpretation of a beta would be the change in the dependent variable (percentage) comparing male to female dentists when adjusting for covariates.

Figure 2 presents the use of preventive agents on adult patients by network dentists (hypothesis 1). Female dentists were significantly more likely to have recommended an at-home regimen of either non-prescription (adjusted means; male, 25%, female, 34%; $\beta =$

6.567, p = .029) or prescription fluoride treatment (male, 21%, female, 33%; β = 7.650, p = .005) for adult patients than male dentists. A significant gender × graduation year effect was found, in that a negative association between years since graduation and the frequency of the use of in-office fluoride on adult patients was only significant for female dentists (β = −1.103, p = .041). There were no differences for the use of a dental sealant, in-office fluoride, or chlorhexidine rinse.

3.2. Caries assessment

Table 1 presents the odds ratios from logistic regression analysis testing for gender differences in the importance of risk factors for use in treatment planning(hypothesis 2). For pediatric patients, female dentists rated recent caries (OR = 1.8, p= .012), presence of several large restorations (OR = 2.3, p= .006), and the current use of fluorides (OR = 1.5, p = .049) as very or extremely important factors to consider in a treatment plan than male dentists. For adult patients, female dentists rated one or more active caries (OR = 2.1, p= .018), recent caries (OR = 1.6, p= .001), current use of fluorides (OR = 1.4, p = .034), and recession or root exposure (OR = 2.9, p < .001) as very or extremely important factors to consider in a treatment plan than male dentists. Ratings of importance for patient's age, decreased salivary flow, current oral hygiene, current diet, the dentist's subjective assessment, or the patient's socioeconomic status were not different for both pediatric and adult patients.

Table 2 presents the practice of caries risk assessment and individualized caries prevention treatment by dentist's gender(hypothesis 3). There were no differences in caries risk assessment, but females reported that their patients were more interested in individualized caries prevention (β = 8.212, p = .035)and more likely to receive individualized caries prevention (β = 14.816, p < .001) than patients of male dentists. There was not a gender difference in agreement that the use of caries risk assessment is predictive of whether or not patients will develop caries in the future.

Table 3 presents the use of diagnostic methods commonly used for assessment of caries. The only significant gender difference in caries diagnostic methods was that male dentists reported a greater frequency of use of magnification to diagnose a carious lesion (63%) of their patients compared to females (48%).

3.3. Caries treatment decisions

Table 5 shows the significant predictors for each dentist's restoration index (threshold for performing a restoration)for each clinical scenario. Female dentists were significantly more conservative (e.g., restore at greater lesion depth) than male dentists on the interproximal lesion (p = 0.031) scenarios. There were no gender differences on the occlusal scenarios.

4. Discussion

To our knowledge, this is the first study to examine the use of a comprehensive range of diagnostic methods, preventive agents, and restorative decisions for caries between male and female dentists. Overall, among general dentists who were members of The Dental Practice-Based Research Network and practicing in the US, female dentists had a greater orientation for caries prevention and made more-conservative clinical decision in caries treatment in some situations than male dentists. However, there were as many areas of practice where they are similar as different.

It has been shown that male and female dentists both performed similar numbers of procedures per patient and received similar income per patient seen in practice (4). In further support of this conclusion, this study shows that when only full-time dentists were

considered, males and females had equal amounts of patients. Although total income was not asked, these data also showed that fees charged by female dentists for restorations were similar to their male counterparts, and female dentists were equally likely to see patients with dental insurance. If differences in income per patient do exist, they could relate to the types of procedures performed, as one previous study has found that female dentists refer complex and potentially more-profitable cases to specialists more often than male dentists (6).

Although the dental literature is mixed (6,12), female dentists had a greater overall preventive orientation than male dentists for both adult and pediatric patients. Consistent with increases in the proportion of females graduating from US dental schools, female DPBRN dentists were younger and more-recent graduates than their male colleagues. These graduation patterns coincide with findings from other DPBRN studies that show dentists with fewer years since graduation were more likely to have recommended preventive treatment than those with more years since graduation (26). Brennan and Spencer found that for both genders, dentists aged 29 years and younger had higher preventive treatment rates than those over 65 years of age (12). Adjustments for gender-related differences in the graduation year and related interactions were made in the statistical analysis. The only finding contrary to the hypothesis for greater prevention among female dentists was that males tend to use in-office fluoride more often on pediatric patients.

There are many elements that can affect rate of preventive services in dental offices which could be associated with gender (27). For example, residing in a lower socioeconomic status location was associated with a lower preventive rate among Australian dentists (12). Another study found that 62% of the dental respondents indicated that the patient's behavior influenced decisions to place a sealant (28). Other important factors could include whether the patient has dental insurance, local norms for prevention, caries risk of the dentist's patient pool, or even that patients with a high priority for caries prevention also seek out a female dentist (29). One study has linked reimbursement rates and the use of in-office administered fluorides by dentists (28) and another found that increased financial incentive significantly increased sealant use on the molars of children, whereas education in evidenced-based practice did not (30). Neither of these studies tested for gender effects. There were no gender differences in the percent of patients seen in a practice who have dental insurance in this sample, suggesting minimal gender bias associated with financial incentives.

Caries risk assessment has been examined in several recent studies. Caries risk assessment determines the probability of caries incidence in a certain period of time (29), and this study suggests that female dentists consider caries history as more important in treatment planning than male dentists. There were few differences in diagnostic methods employed by male and female dentists, and both agreed on the effectiveness of caries risk assessment. However, our previous report has indicated that while gender was not associated with the practice of risk assessment, it did show considerable variability in how risk was determined (31). There were few gender differences in diagnostic methods. Although not differing by gender, 90% of network dentists reported that they use an explorer to probe the margin of an existing restoration, a procedure thought to be inadequate for caries detection and with potential for iatrogenic injury (32).

Female dentists took a more-conservative approach to restoration on the case scenario that involved patients with interproximal lesions. However, it was fewer years since graduation, and not gender, that was associated with restoration at a greater lesion depth (more-conservative approach) for the occlusal lesion scenarios. One reason for avoiding early restorations is that it reduces the probability of multiple replacements, which in turn further

weakens the tooth structure (33). However, as stated previously, another study found no difference between male and female dentists with regard to the number of procedures performed per patient (4).

Some limitations to these data should be noted. The study sample is not a random sample of general dentists in the United States. However, based on comparisons to dentists who responded to the 2004 ADA Survey of Dental Practice, DPBRN dentists have much in common with dentists at large (23). DPBRN dentists represent a substantial diversity with regard to practice settings, patient populations, rural-urban area of residence, and geographic locations. Participation rate was lowest in the AL/MS region and the majority of dentists recruited in that region were enrolled in DPBRN to participate in other studies before DPBRN became a network that comprises five regions, and this may explain their lower participation rate. The questions about preventive treatments were asked separately; consequently, we are unable to infer to what extent individual patients were given or had recommended single or multiple treatments. It should be noted that the gender tests on the importance of caries risk were comparing a binary coded variable moderately or less important with very or extremely important and that we do not imply that dentists differed on whether caries risk in a treatment plan is of general importance.

Conclusion

The hypotheses that female dentists would differ from male dentists on caries diagnosis and treatment were only partially supported. We found that female dentists who were members of The Dental Practice-Based Research Network have a greater preference than male dentists for individualized caries preventive regimens and are more likely to recommend at-home fluoride treatments for both pediatric and adult patients. Female dentists also took a more-conservative approach, choosing to restore interproximal lesions at a later stage of their development, while preferring to use preventive therapy at earlier stages. The data indicated that there were few gender differences in diagnostic methods, time spent doing restorative dentistry, and busyness of their practices. It appears that female dentists differ from their male counterparts in only some aspects of the prevention, treatment, and assessment of dental caries (25,33).

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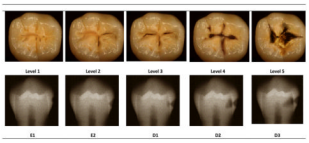

Figure 1. Images* for evaluating case scenarios for occulusal and interproximal dental caries lesions

Instructions for adult scenarios. 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 attended your practice on a regular basis for the past 6 years.

Occlusal lesion. Low-risk: No other restorations than the one shown, no dental caries, and is not missing any teeth. High-risk: Has 12 teeth with existing dental restorations, heavy plaque and calculus, multiple Class V white spot lesions, and is missing 5 teeth.

Interproximal lesion. Low-risk: No dental restorations, no dental caries, and is not missing any teeth. High-risk: Has 12 teeth with existing dental restorations, heavy plaque and calculus, multiple Class V white spot lesions, and is missing 5 teeth. Pediatric patient: A 12-year old child with no relevant medical history. The patient is in your office today for the first time for a routine visit. She has 5 restorations and moderate plaque. A rubber dam cannot be used.

*Reproduced with permission(34).

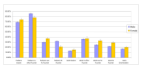

Figure 2.
Distribution of preventive agents (%, SE) used in pediatric patients by male and female DPBRN dentists.

Table 1

Importance of caries risk factors for use in a treatment plan.

	Pediatric patients		Adult patients	
	Very or extremely important (M%, F%) ***Sample size (M, F)***	**Odds Ratio(95% CI)**	**Very or extremely important (M%, F%)** ***Sample size (M, F)***	**Odds Ratio(95% CI)**
Patient's age	52%, 48% *(M=381, F=72)*	1.1 (0.6, 1.8), p =.709	39%, 45% *(M=380, F=73)*	1.9(1.1, 2.8), p = .034
Decreased salivary flow	83%, 89% *(M=381, F=71)*	1.4 (0.8, 2.6), p =.198	89%, 90% *(M=381, F=72)*	1.6(0.6, 3.3), p =.266
Current oral hygiene	69%, 71% *(M=380, F=72)*	1.4(0.7, 2.7), p =.289	55%, 66% *(M=381, F=72)*	1.9(1.1, 2.5), p = .043
Current diet	70%, 76% *(M=381, F=72)*	1.7 (0.9, 3.1), p = .113	67%, 72% *(M=381, F=73)*	1.4 (0.8, 2.3), p =.143
One or more active caries	79%, 83% *(M=381, F=72)*	1.2(0.7, 2.0), p =.457	75%, 86% *(M=380, F=73)*	2.0(1.2, 3.2), p = .024
Recent caries	72%, 81% *(M=380, F=72)*	1.8 (1.2, 3.2), p = .012	*68%, 82% (M=380, F=73)*	2.3(1.3, 4.1), p = .014
Presence of several large restorations	56%, 69% *(M=381, F=71)*	2.3 (1.3, 4.0), p = .008	55%, 61% *(M=380, F=73)*	1.7(0.9, 2.3), p =.079
Current use of fluorides	51%, 59% *(M=381, F=72)*	1.5 (1.1, 2.5), p = .042	43%, 54% *(M=380, F=73)*	1.8(1.1, 2.3), p = .029
Dentist's subjective assessments	69%, 73% *(M=380, F=72)*	1.5(0.8, 2.6), p =.205	71%, 72% *(M=381, F=73)*	1.3(0.7, 2.3), p =.462
Patient's socioeconomic status	15%, 20% *(M=382, F=72)*	1.4(0.8, 3.1), p =.206	20%, 20% *(M=379, F=72)*	1.1 (0.6, 2.3), p =.764
Recession or root exposure		Not asked	54%, 69% *(M=380, F=72)*	3.0(1.6, 4.8), p =.001

[a] Network dentists were given the following instructions before rating these risk factors. How important is each of the factors when you decide on a treatment plan? These questions were asked for patients 6–18 years of age and for patients with more than 18 years of age.

[b] Original response choices were: Not at all important=1, Slightly important=2, Moderately important=3, Very important=4, Extremely important=5. Responses were dichotomized to allow comparisons between very or extremely important (coded for analysis=1) with less important categories (not at all, slightly or moderately important; coded=0).

[c] Oral hygiene was recoded to "not at all important-very important=0 and extremely important=1".

[d] Separate analyses were performed for each variable using the general linear model. Gender × years since graduation and gender × practice type interactions were tested. Analyses were adjusted for years since graduation, practice type, part-time practice, and practice ownership. No interaction effects were significant.

[e] Gender was coded Male=0 and Female=1with males used as the reference category. An odds ratio of greater than one represents the increase in the probability of selecting very or extremely for female dentists compared to male dentists.

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Table 2

Use of caries risk assessment and individualized caries prevention treatment.

Variable. ***Sample size (M, F)***	**Male** **n (%)**	**Female** **n (%)**	**P. value**
Do you assess caries risk in any way? *(M=393, F=73)*	264 (70%) [a]	54 (74%)	.340 [c]
If yes: Do you record the assessment on a special form that is kept in the patient chart?	45 (17%) [a]	14 (26%)	.068 [d]
Mean percent of patients in practice who are interested in an individualized caries preventive treatment. *(M=386, F=73)*	39% (SE=2.0)	48% (SE=3.5)	.019
Mean percent of patients given individualized preventive treatment specifically for their needs. *(M=387, F=73)*	49% (SE=1.6)	69% (SE=4.0)	<.001
How strongly do you agree with this statement: "A dentist's assessment of caries risk for a patient can predict whether or not that patient develops new caries in the future." (dichotomized into strongly disagree, somewhat disagree, neither agree or disagree=1, somewhat agree, strongly agree=2). *(M=388, F=73)*	292 (75%) [ab]	56(77%) [b]	.596 [e]

[a] Males were the reference category

[b] Dentists who endorsed somewhat/strongly agree.

[c] Odds ratio = 0.98, 95% CI=0.55, 1.73

[d] Odds ratio = 1.20, 95% CI=0.98, 1.55

[e] Odds ratio = 1.02, 95% CI=0.89, 1.30

Separate analyses for each variable were performed using the general linear model for parametric models and logistic regression for dichotomous variable. Gender × years since graduation and gender × practice type interactions were tested. Analyses were adjusted for years since graduation, practice type, part-time practice, and practice ownership. No interaction effects were significant. Adjusted means are reported.

Table 3

Use of diagnostic methods for dental caries.

Variable. *Sample size (M, F)*	Male mean % (SE)	Female mean % (SE)	P. value
When you examine patients to determine if they have a:			
Caries lesion on a proximal (mesial or distal) surface, on a posterior tooth, on what percent of these patients do you use radiographs to help diagnose the lesion? *(M=382, F=73)*	94% (0.4)	93% (1.0)	.309
Caries lesion on the occlusal surface: on what percent of these patients do you use radiographs to help diagnose the lesion? *(M=381, F=73)*	58% (1.7)	53% (4.0)	.210
Primary occlusal caries lesion: on what percent of these patients do you use a dental explorer to help diagnose the lesion? *(M=382, F=73)*	91% (1.0)	90% (2.6)	.728
Caries lesion at the margin of an existing restoration (recurrent/secondary caries): on what percent of these patients do you use a dental explorer to help diagnose the lesion? *(M=381, F=73)*	92% (0.8)	91% (1.8)	.695
Primary caries lesion on the occlusal surface: on what percent of these patients do you use laser fluorescence (for example, Diagnodent ®)? *(M=38, F=73)*	7%(1.1)	7% (2.7)	.882
Primary caries lesion: on what percent of these patients do you use air-drying to help diagnose the lesion? *(M=38, F=73)*	69% (1.6)	67% (3.8)	.464
Approximately for how long do you dry the tooth surface? (mean seconds) *(M=264, F=50)*	1.2 (0.1)	1.0 (0.2)	.151
Caries lesion on a proximal (mesial or distal) surface of an anterior tooth: on what percent of these patients do you use fiber optic transillumination to help diagnose the lesion? *(M=380, F=73)*	22% (1.4)	17% (3.3)	.088
Caries lesion: on what percent of these patients do you use some sort of magnification to help diagnose the lesion? *(M=384, F=73)*	63% (2.1)	48% (5.2)	.010

Separate analyses were performed using the general linear model for each variable. Gender × years since graduation and gender × practice type interactions were tested. Analyses were adjusted for years since graduation, practice type, part-time practice, and practice ownership. No interaction effects were significant. Adjusted means are reported.

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Table 4

Dentist, patient, and practice characteristics.

Variable	Male, n=393	Female, n=73	P. value
Race/ethnicity of dentist *(n=463)*			
White	358(92%)	60 (82%)	.154
African American	10 (3%)	5 (7%)	
Hispanic	8 (2%)	3 (4%)	
Asian	7 (2%)	2 (3%)	
Other	7 (2%)	3 (4%)	
Years since graduation from dental school	24.4 (SD=10.4)	16.0 (SD=7.9)	<.001
Full-time (32+ hours per week in patient care) *(n=464)*	348 (89%)	55 (75%)	.002
Number of patients seen each week (among full-time)	51.0 (SD=25.6)	48.6 (SD=37.6)	.412
Number of dental chairs per office *(n=464)*	4.5 (SD=2.3)	4.2 (SD=2.3)	.362
Practice model			
Private practice	333 (85%)	55 (75%)	.109
Large group practice	56 (14%)	17 (23%)	
Public Health	4 (1%)	1 (1%)	
Practice owner or partner *(n=460)*	287 (74%)	38 (54%)	<.001
Days wait for examination appointment *(n=453)*	11.6 (SD=15.7)	11.1 (SD=11.7)	.851
Days wait for treatment appointment *(n=454)*	11.1 (SD=15.9)	11.6 (SD=11.2)	.720
Percent of patients ages 1–18 years *(n=454)*	19% (SD=11)	22% (SD=16)	.041
Percent of patients ages 65 years and older *(n=454)*	22% (SD=12)	21% (SD=14)	.622
Percent of time spent on non-implant restorations *(n=403)*	60% (SD=18)	62% (SD=21)	.387
Fee for restoration for a 2 surface amalgam (dollars) *(n=367)*	95.19 (SD=63)	98.10 (SD=21)	.612
Percent of patients who have dental insurance *(n=452)*	66% (SD=22)	67% (SD=24)	.757

Where the response rate was less than 100% *(n=466)*, the number of responses is indicated. Categories may not sum to 100% because of rounding errors.

Table 5

Predictors for each dentist's restoration index (severity/depth threshold for performing a restoration)for the clinical scenarios.

Occlusal lesion, adult *(n=450)*	**Odds Ratio (95% CI)**		**p. value**
Gender	1.16 (0.92, 1.41)		.349
Risk	1.40 (1.32, 1.49)		<.001
Private practice	1.59 (1.31, 1.94)		<.001
Years since graduation	1.02 (1.01, 1.03)		.008
Part-time practice	0.93 (0.78, 1.05)		.959
Ownership	1.20 (0.98, 1.44)		.088
Gender × Risk	0.96(0.93, 1.11)		.515
Gender × Private practice	0.99 (0.84, 1.21)		.643
Gender × years since graduation	0.93 (0.65, 1.35)		.715
Lesion depth for recommending a restoration	E1/E2	D1	D2/D3
Male (low-risk scenario)	44 (12%)	130 (35%)	203 (54%)
Female (low-risk scenario)	4 (6%)	24 (33%)	45 (62%)
Male (high-risk scenario)	100 (26%)	143 (38%)	134 (36%)
Female (high-risk scenario)	11 (15%)	36 (49%)	26 (36%)
Occlusal lesion, pediatric *(n=443)*	Odds Ratio (95% CI)		p. value
Gender	0.93 (0.77, 1.13)		.405
Private practice	1.38 (1.17, 1.73)		.001
Years since graduation	1.01 (1.01, 1.02)		.025
Part-time practice	0.93 (0.76, 1.15)		.579
Ownership	1.10 (0.90, 1.22)		.312
Gender × Private practice	0.97 (0.85, 1.21)		.256
Gender × years since graduation	0.93 (0.75, 1.30)		.635
Lesion depth for recommending a restoration	E1/E2	D1	D2/D3
Male	57 (15%)	155 (42%)	160 (43%)
Female	9 (13%)	29 (41%)	33 (47%)
Interproximal lesion, adult *(n=453)*	Odds Ratio (95% CI)		p. value
Gender	0.88 (0.79, 0.98)		.031
Risk	1.61 (1.50, 1.84)		<.001
Private practice	1.33 (1.17, 1.51)		<.001
Years since graduation	0.99 (0.99, 1.01)		.845
Part-time practice	1.03 (0.83, 1.25)		.752
Ownership	1.09 (.098, 1.28)		.155
Gender × Risk	0.97 (0.77, 1.21)		.971
Gender × Private practice	0.93 (0.82, 1.14)		.545
Gender × Years since graduation	0.98 (0.77, 1.24)		.770
Lesion depth for recommending a restoration	E1/E2	D1	D2/D3

Occlusal lesion, adult *(n=450)*	**Odds Ratio (95% CI)**		**p. value**
Male (low-risk scenario)	175 (46%)	197 (52%)	10 (3%)
Female (low-risk scenario)	23 (31%)	47 (65%)	3 (4%)
Male (high-risk scenario)	311 (81%)	72 (19%)	-----
Female (high-risk scenario)	47 (63%)	26 (37%)	-----

[a] Responses were coded as E1/E2=1, D1=2, and D2/D3 =3 (see Figure 1).

[b] Separate analyses were performed using general estimating equations for each set of clinical scenarios. Gender × years since graduation and gender × practice type interactions were tested. Analyses were adjusted for years since graduation, practice type, part-time practice, and practice ownership.

[c] Gender was coded Male=0 and Female=1. An odds ratio of greater than one represents the increase in the probability of selecting the next higher coded category (repair/replace at a greater lesions depth) for female dentists compared to male dentists.

[d] The number of male and female dentists responding to each clinical scenario can be determined by summing across the responses in the table.