ORIGINAL RESEARCH

Practitioner Engagement in Activities of the National Dental Practice-Based Research Network (PBRN): 7-Year Results

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Purpose: **To 1) quantify practitioner activities of the National Dental Practice–Based Research Network (Network) for which Continuing Education (CE) credits were received (study training, videos, webinars, meetings, and symposia); 2) quantify practitioner coauthoring Network publications and presentations; and 3) test whether practitioner characteristics were associated with participation in these activities.**

Methods: **A retrospective analysis of 4361 practitioners who enrolled in the Network between April 12, 2012 and October 12, 2018.**

Results: **Overall, 59% (n = 2586) of practitioners earned CE credit from the Network; among these, 68% (n = 1757) from a video, 38% (n = 993) attended an annual Network meeting, 31% (n = 798) due to training for a Network clinical study, 9% (n = 226) attended a national symposium, and 7% (n = 170) participated in a Network webinar. Members of 2 large group practices earned on average more CEs than practitioners from other practice settings. Four percent (n = 159) of practitioners coauthored a Network presentation or publication. Practitioners who received their dental degree before 2000, were general practitioners, or were members of 2 large group practices, were more likely to have coauthored a publication or presentation.**

Conclusion: **This Network used a broad range of activities to engage community practitioners. These activities were successful in sustaining a high level of practitioner engagement in clinical research and its relevance to everyday clinical practice. (J Am Board Fam Med 2020;33:687–697.)**

Keywords: **Continuing Education, General Practitioners, National Institute of Dental and Craniofacial Research, Practice-Based Research, Publishing, Retrospective Studies**

Introduction

A practice-based research network (PBRN) is a group of practices that aim to foster quality improvement through participation in research and translation of new knowledge into everyday clinical practice.[1] PBRNs have responded to the changing health care landscape by broadening their membership (eg,

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dental, primary care, pharmacy, ancillary staff, community partners) and embracing diverse research methodologies.[2] The PBRN context is a promising means of advancing clinical practice by incorporating practitioners into each step of the research process, engaging them in collegial activities, studying relevant research questions, and obtaining large amounts of clinical research data in a relatively short period.[3] Practitioner engagement is crucial to this endeavor. In 2012, the National Institute of Dental and Craniofacial Research funded a single, unified national PBRN called the "National Dental PBRN".[4]

The Network recognizes that the ability to sustain an existing PBRN is dependent on the number of studies conducted, the quality of research conducted, successful retention, and above all, recruitment and meaningful engagement of practitioners.[5–8] Results from a recent analysis of enrolled Network member participation indicated that the Network has achieved high rates of sustained study participation and has provided an effective research context to obtain data from diverse populations.[9] The Network has increased practitioner participation by including practitioners in all aspects of the research process, posing questions that improve the health of patients, minimizing time/workflow pressures, supporting participating practitioners, holding periodic annual meetings, implementing practical and feasible study designs, streamlining protocol training and using quick-reference guides, disseminating study results to practitioners and offering continuing education (CE) credit[9].

Similar to medical PBRN's that view offering continuing medical education credits to participating physicians as vital,[10] the Network offers CE credit to dental practitioners for completing a Network orientation video, human subject protection training, study protocol training, and for attending sessions about study results presented in various formats, such as videos offered via YouTube, webinars, annual regional practitioner meetings, and American Association for Dental Research (AADR) symposia. Other Network engagement activities include the opportunity to coauthor Network publications and presentations and respond to Quick Polls (brief qualitative surveys about clinical topics).

All engagement activities occur with an eye toward answering questions of daily clinical relevance that have the potential to improve clinical practice and positively affect patients' oral health.[3] The purpose of this publication is to 1) quantify practitioner activities of the Network for which CE credits were received (study training, videos, webinars, meetings, and symposia); 2) quantify practitioner coauthoring Network publications and presentations; and 3) test whether practitioner characteristics were associated with participation in these activities.

Methods

A retrospective analysis was conducted of practitioners who enrolled between April 12, 2012 and October 12, 2018 and activities as of December 17, 2018. Once these were quantified, we tested whether specific practitioner characteristics were associated with practitioner engagement in these activities. At Network enrollment, practitioners completed an Enrollment Questionnaire to describe themselves, their practice(s), and their patient population. Questionnaire items, which had documented test/retest reliability, were taken from previous work in a practice-based study of dental care.[5–8,11] The full questionnaire is publicly available.[12]

CE Credit

The Network offers free CE for its members. Network membership is also free. The Network offers this service as a courtesy to the members to assure they can maintain their required credits as well as stay engaged and informed of the latest Network study results. CE credits awarded are described by source (Table 1) and include:

- Study training: required for participation in each of the Network's clinical studies (1 CE credit per study);
- Network study results dissemination: videos (n = 4) and webinars (n = 3) were organized centrally through the University of Alabama at

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Conflicts of interest: None.

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Table 1. Sources of Continuing Education for Dentists: National Dental Practice–Based Research Network, April 2012 through December 2018

		Any Study Training
Studies for which the practitioner received training	N	(n = 798)
Cracked tooth registry (CTR)	242	30%
Factors in successful crowns	179	22%
Management of dentin hypersensitivity (MDH)	165	21%
Management of painful temporomandibular disorders (TMD)	149	19%
Predicting outcomes of root canal treatment (PREDICT)	127	16%
Suspicious occlusal caries lesions (SOCL)	100	12%
Anterior openbite malocclusions in adults (AOB)	97	12%
Quit advisor DDS	74	9%
Risk of oral cancer study (ROCS)	38	5%
		Any video
Video topic	N	(n = 1757)
Orientation	1560	89%
International oral health conference	248	14%
Human subjects protection	169	10%
ROCS study results	120	7%
PREDICT study results	64	4%
Opioid prescribing study results	6	<1%
Knowledge networks study results	5	<1%
		Any webinar
Webinar topics: study results for	N	(n = 170)
Opioid prescribing	67	39%
PREDICT	43	25%
SOCL	41	24%
Factors in successful crowns	35	21%
Knowledge networks	26	15%
		Any network Symposium
Network symposium attendances (Number)	N	(n = 226)
1	149	66%
2	49	22%
3 or more	28	12%
		Any regional network meeting
Network meeting attendances (Number)	N	(n = 993)
1	519	52%
2	222	22%
3	111	11%
4	74	7%
5	45	5%
6 or more	22	2%

Birmingham but available online to all members in each region of the Network (1 CE each). The videos were offered via YouTube;

- Network orientation: participants could view an orientation video after completing the Enrollment Questionnaire (0.5 CE);
- Human Subject Protection Training: the Southwest region offered a video on protection of human subjects, a training required by Institutional Review Boards (IRBs) for clinical study participation (1 CE);
- Practitioner Network Meetings: each regional node typically had an annual meeting to which members were invited to meet with fellow colleagues, learn about study results, and earn 4 to 7 CE credits;[13]

- AADR symposia: practitioners attended these symposia and represented their respective regions to learn more about the breadth of oral health research (2 to 7 CEs).

Publications and Presentations

The Network makes a point of giving practitioners opportunities to serve as authors on peer-reviewed and nonpeer-reviewed publications and presentations at scientific and clinical meetings. For each practitioner, we ascertained whether they coauthored a presentation or publication, and categorized it as whether or not it was peer reviewed.

Statistical Analysis

We describe the number of CE sources with which practitioners engaged as well as the distribution of the number of times each practitioner engaged in a given CE source type. We calculated descriptive statistics, namely, mean with standard deviation (SD), and median with interquartile range (IQR), of the total number of CEs and for each type of CE source. The frequencies of whether a practitioner earned a CE credit, separately for those earning only 0.5 for the orientation video and for those earning 1 or more CEs, were obtained according to practitioner and practice characteristics; chi-square tests were used to assess the significance of the differences. To identify independent associations, logistic regression was used with an entry criterion of $P < .10$ and a retention criterion of $P < .05$. Odds ratios and 95% CIs were calculated from the models. Some categories were collapsed based on bivariate analysis. These analyses were repeated for whether a practitioner coauthored a publication or gave a presentation. For total number of CEs, general linear models, with analysis of variance (ANOVA) was used. Pearson's correlation coefficients were used to evaluate possible collinearity of characteristics before entering them into a general linear model. All analyses were performed using SAS software (SAS v9.4, SAS Institute Inc., Cary NC).

Results

Network Members

Overall, 4361 dentists were Network members. Table 2 shows members' demographic characteristics. The mean age at enrollment was 50 years (SD = 12), with a median of 51 years (IQR, 39 to 59 years) and a range of 24 to 92 years. Most members (74%, n = 3227) were general practitioners, and 82% (n = 3512) were in private practice, of whom 2917 were owners. Few (5%, n = 201) were in large preferred provider/managed care plans of HealthPartners Dental Group (HPDG) or Permanente Dental Associates (PDA) practices, or in public/community health practices 4% (n = 179). Slightly more were in academic, federal, or other managed care plans (10%, n = 412). Network regional representation ranged from 13% to 20%.

Quick Polls

Forty Quick Polls were conducted from June 2014 to June 2018. The mean number of responses was 476 (SD = 130), with a median of 444 (IQR, 394 to 549) and a range of 277 to 782. The number of Quick Polls conducted per calendar year was 6 in 2014, 11 in 2015, 9 in 2016, 7 in 2017, and 7 in 2018. Response was less in 2016 than in other years (377 vs 505, $P = .007$).

CE

Overall, 59% (n = 2586) of practitioners earned some CE; among these, 68% (n = 1757) did so through a video, 38% (n = 993) through an annual Network meeting, 31% (n = 798) through training for study participation, only 9% (n = 226) through national symposia, and 7% (n = 170) through a Network webinar. Table 3 shows the number of CE sources (eg, videos, meetings) in which a practitioner earned CEs, and for each source type, the number within that type for which the practitioner earned CE credit. Overall, 61% (n = 1580) earned CEs through 1 type of source, 28% (n = 724) through 2 types, and 8% (n = 215) through 3 types. This was similar for regional meetings, symposia, and study trainings, while for videos and webinars a higher majority earned a CE through only 1, namely, 82% (n = 1444) for videos and 85% (n = 144) for webinars.

The mean number of CE credits earned, was 6.0 (SD = 9.0), median = 2.0 (IQR, 0.5 to 7.5). The descriptive statistics for each source of CEs are presented in Table 3.

As videos were the most common source of CE, and the orientation video was the mostly commonly watched video (n = 1560), overall CE analysis was repeated excluding the orientation video (n = 811, 19%). A total of 1775 (41%) practitioners earned at least 1 CE credit from engagement activities; the same number did not earn any CE. The distribution by number of types of sources of CE among the 1775 who earned at least 1 CE, excluding watching the

Table 2. Distribution of Practitioner Characteristics, by Whether the Practitioner Earned Any Continuing Education Credits and Whether the Practitioner Coauthored Any Presentation or Publication; National Dental Practice–Based Research Network, April 2012 through December 2018

Practitioner Characteristics	All (n = 4361)		Continuing Education (CE)					Any Type Publication (n = 159)		
			Orientation Only (n = 811)		≥ 1 CE (n = 1775)					
	N*	%†	N	Row %‡	N	Row %	*P*	N	Row %	*P*
Gender							<.001			.3
Male	3063	71%	598	20%	1299	42%		117	4%	
Female	1270	29%	209	16%	463	36%		40	3%	
Race-ethnicity§							<.001			.6
White	3314	76%	642	19%	1413	43%		121	4%	
African-American	182	4%	40	22%	71	39%		4	2%	
Asian	473	11%	63	13%	149	32%		16	3%	
Other/unknown	115	3%	14	12%	38	33%		4	3%	
Hispanic	277	6%	52	19%	104	38%		14	5%	
Age at network enrollment							<.001			.026
<35 years	591	14%	105	18%	205	35%		17	3%	
35–44 years	951	22%	175	18%	363	38%		26	3%	
45–54 years	968	22%	164	17%	418	43%		48	5%	
55–64 years	1298	30%	257	20%	571	44%		55	4%	
65+ years	491	11%	101	21%	203	41%		13	3%	
Year graduated dental school							<.001			<.001
Before 1980	915	21%	215	24%	414	45%		27	3%	
1980–1989	1247	29%	216	17%	553	44%		67	5%	
1990–1999	867	20%	152	18%	369	43%		36	4%	
2000–2009	948	22%	180	19%	352	37%		22	2%	
2010 or later	347	8%	43	12%	80	23%		6	2%	
General dentist/ specialist							<.001			.002
General dentist	3227	74%	635	20%	1402	43%		135	4%	
Specialist	1123	26%	172	15%	366	33%		24	2%	
Practice type							.2			.01
Owner, private	2917	68%	561	19%	1207	41%		93	3%	
Associate, private	595	14%	106	18%	227	38%		23	4%	
HP/PDA	201	5%	30	15%	90	45%		16	8%	
Public, Community Health	179	4%	32	18%	75	42%		8	4%	
Academic, other¶	412	10%	70	17%	157	38%		16	4%	
Network region							<.001			.049
Western	680	16%	52	8%	177	26%		27	4%	
Midwest	533	13%	88	16%	229	43%		29	5%	
Southwest	798	19%	147	18%	263	33%		18	2%	
South Central	770	18%	212	28%	441	57%		31	4%	
South Atlantic	554	13%	137	25%	262	47%		20	4%	
Northeast	849	20%	146	17%	304	36%		25	3%	

HP, HealthPartners Dental; PDA, Permanente Dental Associates.
*Numbers not summing to column N within characteristic due to missing values.
†Column percents, not summing to 100 due to rounding.
‡Row percents, viz., percent received CE amount, or co-authored publication within practitioner characteristic.
§Races are non-Hispanic.
¶Academic n = 301, Federal n = 70, other n = 41.

Table 3. Distribution of Continuing Education (CE) Credits Earned by Network Practitioners, by Number of Sources of CE, and by Number within Each Type of Source

CE Source	Any CE N	Any CE %	Mean	SD	Median	Interquartile Range
Type of sources of CE, n	(n = 2586)		6.0	9.0	2.0	0.5 to 7.0
1	1580	61	Excluding orientation video (now N = 1775 any CE)			
2	724	28	8.3	10.0	5.0	1.0 to 11.5
3	215	8				
4	64	2				
5	3	<1				
	Any Network Meeting					
Network meetings, n	(n = 993)		11.3	8.1	7.2	6.0 to 15.0
1	519	53				
2	222	22				
3	111	11				
4	74	7				
5	45	4				
6–15	22	2				
	Any Symposia (AADR/IADR)					
Symposia (AADR/IADR), n	(n = 226)		6.3	5.3	5.0	2.0 to 7.0
1	149	66				
2	49	22				
3	11	5				
4	6	3				
5	4	2				
6	7	3				
	Any Study Training					
Studies received training, n	(n = 798)		1.5	0.8	1.0	1.0 to 2.0
1	549	69				
2	164	21				
3	61	8				
4	12	2				
5–6	12	2				
	Any Video					
Videos, n	(n = 1757)		0.8	0.6	0.5	0.5 to 1.0
1	1444	82				
2	239	14				
3	50	3				
4–5	24	1				
	Any Webinar					
Webinars, n	(n = 170)		1.2	0.7	1.0	1.0 to 1.0
1	144	85				
2	16	9				
3–4	10	6				

SD, standard deviation.

orientation, was similar to the distribution before the exclusion, namely, 64% (n = 1128) had 1 type of source, 26% (n = 462) had 2, and 8% (n = 142) had 3 types of sources; 26% (n = 465) earned a CE through video. Excluding the orientation video only raised the mean number of CE credits earned from 6.0 to 8.3 (SD = 10.0) and median from 2.0 to 5.0 (IQR, 1.0 to 11.5). The mean number of CE credits earned from

videos increased from 0.8 to 1.3 (SD = 0.7) and median from 0.5 to 1.0 (IQR, 1.0 to 1.0). The mean increased because excluding the relatively large number (n = 811) whose only CE was from the orientation (only 0.5 CE), skewed the mean to smaller value.

Publications and Presentations

Overall, 4% (n = 159) coauthored a publication or gave a presentation (Table 4). A total of 19% (n = 30) coauthored only peer reviewed, 31% (n = 49) only nonpeer reviewed, and 50% (n = 80) both (Table 4). In terms of whether an item was an abstract, presentation, or publication (not mutually exclusive): 72% (n = 114) coauthored an abstract, 50% (n = 80) gave a presentation, and 60% (n = 95) coauthored a publication. The distribution of each of these 3 presentation/publication items according to whether it was peer reviewed is presented in Table 4. Presentations were primarily (88%, n = 70) nonpeer reviewed. In contrast, abstracts and publications were largely peer reviewed.

Associations of Practitioner/Practice Characteristics with Whether Earned Any CE Credits or Coauthored a Network Publication

Male practitioners; those who were either Hispanic, non-Hispanic White, or African-American (compared with Asians and other races); older in terms of age when enrolled in the Network or earlier year when graduated dental school; or a general practitioner (compared with a specialist), were more likely to earn any CE, compared with members who earned no CEs (Table 2). As age at Network enrollment and year graduated dental school were strongly, inversely correlated (r = −0.92; $P < .001$), only the latter was used when assessing independence of associations (models using multiple regression). Year graduated dental school; general practitioner versus specialist; and inverse association with being from the Western region; were each independently associated with a practitioner earning 0.5 CE from the orientation video compared with practitioners not earning any CE.

All bivariate associations described above retained significance when comparing practitioners who earned 1 or more CE credit to those earning none (Table 5). The only item that differed between practitioners who earned 1 or more CEs and those who only earned 0.5 CE from watching the orientation video was the region in which they practiced. Only Western region practitioners were more likely to have earned 1 or more CEs than 0.5 CEs when compared with practitioners from other regions. However, practitioners from the other 5 regions were more likely to have earned 0.5 CE versus none as well as more likely to have earned more than 1 CE versus none.

Among practitioners earning 1 or more CE credits, those who were members of either HPDG or PDA practices earned on average more CE credits than practitioners from other practice settings (number of CE credits: 12.0 [SE = 1.0]; 8.1 [SE = 0.2]; $P < .001$), as did practitioners from the Midwest and Western regions (regions where HPDG and PDA are located) (10.4 [SE = 0.5]; 7.5 [SE = 0.3]; $P < .001$). When considered together, only region retained significance. Of the 159 practitioners who coauthored a publication or presentation, 156 earned 1 or more CEs and the remaining 3 earned 0.5 from the orientation video. Practitioners who received their dental degree before 2000, were general practitioners, were members of either HPDG or PDA practices, and were not from either the Southwest or Northeast region, were more likely to have coauthored a publication or presentation (Table 2). These associations retained significance when considered together (Table 5).

Discussion

This Network used a broad range of strategies and activities to engage community practitioners, many

Table 4. Distribution of the Publication Types Coauthored by Network Practitioners

Whether or Not Peer-Reviewed	Any Item, % (n = 159)	Any Abstract, % (n = 114)	Any Presentation, % (n = 80)	Any Publication, % (n = 95)
Only peer reviewed	19	32	1	52
Only nonpeer reviewed	31	30	88	8
Both	50	39	11	40

Table 5. Multiple Regression Models Relating Practitioner Characteristics to Whether the Practitioner Earned Any Continuing Education Credits or Whether the Practitioner Coauthored Any Publication or Presentation

	Bivariate*		Full Model†		Final/Reduced Model‡		
	Odds Ratio	*P*	Odds Ratio	*P*	Odds Ratio	95% CI	*P*
Orientation only vs no CE							
Male vs female	1.5	<.001	1.2	.07	X§	X	X
White/Black/Hispanic vs Asian/other	1.8	<.001	1.2	.08	X	X	X
Year graduated dental school (per 10 years)	0.80	<.001	0.86	<.001	0.83	0.78–0.89	<.001
General versus specialist	1.8	<.001	1.9	<.001	1.9	1.5–2.3	<.001
Western versus other regions	0.20	<.001	0.21	<.001	0.21	0.15–0.28	<.001
≥1 CE vs no CE (orientation only excluded)							
Male vs female	1.4	<.001	1.2	.02	1.2	1.0–1.4	.02
White/Black/Hispanic vs Asian/other	1.7	<.001	1.3	.008	1.3	1.1–1.6	.008
Year graduated dental school (per 10 years)	0.78	<.001	0.66	<.001	0.66	0.60–0.72	<.001
General versus specialist	1.9	<.001	2.0	<.001	2.0	1.7–2.3	<.001
Western versus other regions	0.33	<.001	0.36	<.001	0.36	0.30–0.43	<.001
≥1 CE vs only orientation							
Year graduated dental school (U shaped)	Cat	.048	Cat	.02	Cat		<.001
Western versus other regions	1.7	.002	1.7	.002	1.7	1.2–2.3	.002
Presentations/publications							
Graduated dental school before 2000	2.0	<.001	2.0	.002	2.3	1.5–3.5	<.001
General practitioner	2.0	.002	2.2	.001	2.1	1.3–3.4	.002
HP/PDA	2.4	<.001	2.2	.01	2.2	1.20–3.93	.01
Southwest or Northeast region	0.61	.006	0.68	.04	0.67	0.46–0.96	.03

HP, HealthPartners Dental; PDA, Permanente Dental Associates; CI, confidence interval; Cat, Categorical.
*Only characteristics associated with outcome (CE or coauthored publication or presentation) at $P < .10$ are listed.
†All characteristics in bivariate analysis with $P < .10$ entered.
‡Only characteristics with $P < .05$ retained.
§X denotes $P > .05$ not retained.

of which provided the opportunity to earn CE. Most, if not all, activities pertained to evidence-based dentistry and improving oral health, such as clinical research studies, disseminating results of Network clinical studies (including use of videos or webinars), or a combination of disseminating results and fostering "collegiality and interaction" among the practitioners via face-to-face meetings and symposia. Our results showed that 60% (n = 4361) of members in the Network were engaged in at least 1 of the activities for which CEs were earned. Earning CE credit is a requirement for continued dental practice licensure in most states.[14] Sinclair-Lian et al[15] and others have found that physician members of medical PBRNs associate opportunities to earn CE credit with their willingness to sustain their involvement with the clinical research studies conducted by a PBRN.

Participation in research has benefited medical clinicians by providing intellectual stimulation that has been associated with retention of clinicians in rural, underserved communities and with long-term change in clinical practice behavior.[16] The National Dental PBRN has disseminated study results that provide guidance for clinical practice change, 1 example being the Suspicious Occlusal Caries Lesions study. The findings suggested that noninvasive management is appropriate and that clinicians should consider long-term monitoring when making treatment decisions about these lesions.[17] These results were disseminated via webinars, research updates, videos, and numerous presentations where CE was provided for it. Other studies have shown how practices can improve patient health by using a nonphysician-dependent, clinical team approach to human papillomavirus (HPV) screening in dental offices by collecting oral rinses for HPV detection[18] and the feasibility of implementing blood glucose testing in community dental practices.[19,20] The Network has also

demonstrated beneficial practice change with regard to evidence-based treatment of early dental decay;[8] the impact of PBRN engagement was most significant for the most-engaged practitioners and consistent with a spillover effect onto same-clinic providers who were not PBRN engaged.

Our results showed that 18% (n = 798) participated in clinical studies, while 41% (n = 1775) were engaged in the benefit of learning from the studies' preliminary findings (before publication) through videos, webinars, meetings and symposia, and through the latter 2 activities, discussion with colleagues. Meetings enable professional networking, which is desired by PBRN participants, but which has been described as difficult to achieve.[21] Highly interactive meetings with fellow practitioners have been reported as effective means to translate scientific findings into clinical practice. Furthermore, practitioners have stated intentions to change practice behavior as a consequence of study results disseminated at meetings.[13] Videos were the most common source of CE credit, and even though members were not able to earn CE credit for all the videos available because of their short duration, videos remain effective engagement tools because they disseminate the Network's research in a convenient, usually short informative format. Many industries seem to be moving toward the shorter time frame presentation style to maintain the audience's attention while still delivering the desired take-away information.[22]

Dental practitioners have an important role in improving oral health by participating in research and implementing the results of studies in their practices.[8] The Network conducted 40 Quick Polls based on topics in which practitioners expressed interest. Although responses to the Quick Polls were not linked to participating members' identifiers, they did offer an easy way for members to give input about ideas for Network studies. PBRN study ideas often come from the practitioners themselves in a bottom-up approach to study selection.[23] To our knowledge, the National Dental PBRN is the only Network that successfully uses Quick Polls as a means to gauge interest in future study topics.

The Network embraces the concept of a "learning health system," that is, an organization where science, informatics, incentives, and culture are aligned for continuous quality improvement and innovation.[23,24] The practitioners are engaged at each step of the research process, from study topic selection to results dissemination, presentation, publication, and implementation of relevant practice changes.[25] A multifaceted approach for eliciting study ideas described as "bottom-up" is popular in medical PBRNs, where both practitioners and academic researchers are active in identifying study questions.[26,27] The Network produced 156 peer-reviewed scientific publications during the 2005 to 2019 funding period and most included a Network practitioner as a coauthor in the writing process. A total of 159 (4%) practitioners coauthored a Network presentation or publication. Although the absolute number of practitioners engaged in publications was relatively small, their input during the early discussion of interim findings and preparation of the manuscript was invaluable. Some practitioners were willing to present Network study results at annual meetings or other dental conferences, instead of or in addition to participating in peer-reviewed publications. This can be valuable to the practitioners in the audience during these presentations because they are able to hear from 1 of their own peers directly, thereby validating the importance of practitioners' participation in the full study development, implementation, and dissemination process.

The engagement activities that the Network offers seem to attract and retain a broad spectrum of members. Our results showed that certain practitioner characteristics (gender and race) were modestly associated with being engaged in activities for which at least 1 CE was earned, while being a general practitioner (vs specialist) and being older in terms of when the practitioner graduated dental school, were more strongly associated with these activities. Results also showed that members of HPDG or PDA practices and general practitioners were more likely to have coauthored a publication or presentation. This may reflect a supportive culture within these large practice groups and that these groups were part of a regional PBRN that preceded the National Dental PBRN.

This study has limitations that should be considered when interpreting its findings. Although Network practitioners have much in common with dentists at large, they may not be representative of a wider representation of dentists.[7,28] Network members are not recruited randomly, so factors associated with Network participation (eg, an interest in clinical research) may make Network dentists unrepresentative of dentists at large. While we cannot assert that Network dentists are entirely representative, we can state that they have much in common with dentists at large, while also offering

substantial diversity in these characteristics. This assertion is warranted because 1) substantial percentages of Network general dentists are represented in the various response categories of the characteristics in the Enrollment Questionnaire; 2) findings from several Network studies document that Network general dentists report patterns of diagnosis and treatment that are similar to patterns determined from non-Network general dentists[29–32] and the similarity of Network dentists to non-Network dentists based on characteristics reported in the 2010 American Dental Association (ADA) Survey of Dental Practice.[33]

Conclusion

This Network used a broad range of strategies and activities we judge can be used to engage community practitioners of all health profession types. These activities were successful in sustaining a high level of practitioner engagement in clinical research and its application to everyday clinical practice. This may serve as a model and provide valuable information to other PBRNs to increase participation rates, whether they engage physicians, dentists, or personnel in other health care professions. We believe that PBRN research will continue to be valuable in transforming dental practice, and the use of these activities can contribute to the overall success of the PBRN mission.

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