CANADIAN DENTISTS' VIEWS ON THE FIRST DENTAL VISIT

by

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ABSTRACT

Introduction: Early dental visits set children on the proper trajectory for a lifetime of optimal oral health. The purpose of this study was to undertake secondary analysis of data obtained from a national survey of Canadian dentists to determine their knowledge, attitudes, and behaviours regarding first dental visits.

Methods: In 2013, the Canadian Dental Association (CDA) surveyed general and pediatric dentists regarding their knowledge, attitudes, and behaviours on the timing of the first dental visit and early childhood oral health. Demographic and practice characteristics were collected. Analyses included descriptive and bivariate analyses, analysis of variance (ANOVA), and multiple logistic regression with forward stepwise selection. Significance was set at ≤ 0.05.

Results: Overall, 3,232 dentists participated. The majority were male (58.5%), general dentists (96.6%), practicing for 20.6 ± 12.8 years in non-metropolitan areas (50.5%). The mean age recommended by dentists for a first visit was 20.4 ± 10.8 months. Only 45.4% recommended a first visit ≤ 12 months of age. The majority (59.5%) knew the correct age recommended for a first dental visit by professional dental organizations was no later than 12 months of age. Most (74.2 %) who had seen a patient ≤ 12 months, did not typically do so (82.3 %). Logistic regression revealed that the odds ratios for recommending a first visit ≤ 12 months of age was 0.66 for males, 0.076 for general dentists, 6.40 if dentists typically saw children ≤ 12 months, 2.12 if they used knee to knee techniques during exams, and 6.37 if they knew the correct age their dental organization recommended for a first visit.

Conclusions: Many Canadian dentists do not recommend first visits by 12 months of age, despite it being the CDA's position. Certain provider characteristics and behaviours influence the age they recommend for first visits. Findings will help to inform targeted educational campaigns directed towards dentists on early childhood oral health.

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Dedication

I would like to sincerely thank my husband and ardent supporter: Payam Towfigh and our three children: Sasha, Kimia, and Ryan. Without their love and support, none of this would have been possible.

I dedicate this thesis to them.

Table of Contents

List of Tables and Figures

Table 1 Characteristics of participants

Variable	N (%)
Province/Territory	
Alberta	401 (12.4)
British Columbia	538 (16.6)
Manitoba	129 (4.0)
New Brunswick	222 (6.9)
Newfoundland and Labrador	83 (2.6)
Nova Scotia	44 (1.4)
Nunavut	2 (0.1)
Northwest Territories	2 (0.1)
Ontario	1382 (42.6)
Prince Edward Island	32 (1.0)
Quebec	214 (6.6)
Saskatchewan	174 (5.4)
Yukon	9 (0.3)
Central Canada	1596 (49.4)
Western Canada	1255 (38.8)
Eastern Canada	381 (11.8)
Location of Practice	
Census Metropolitan	1686 (49.5)
Non-census Metropolitan	1621 (50.5)
Gender	
Male	1889 (58.5)
Female	1343 (41.5)
Year of Graduation	
1951-1970	123 (4.0)
1971-1980	506 (16.4)
1981-1990	790 (25.5)
1991-2000	675 (21.8)
2001-2013	1007 (32.3)
Years in Practice (Mean ± SD)	20.6 ± 12.8
Type of Dentist	
General Dentist	3122 (96.6)
Pediatric Dentist	110 (3.4)
Type of Practice	
Group private practice	1671 (51.7)
Solo private practice	1355 (41.9)
Non-private practice	206 (6.4)

Table 2 Participants' knowledge, attitudes, and behaviours about the first dental visit

Variable	N (%)
Age recommended for a child's first dental visit (months)	
0-6 months	242 (7.5)
7-12 months	1206 (37.7)
13-24 months	829 (25.9)
25-36 months	860 (26.9)
37-48 months	57 (1.8)
49-72 months	8 (0.2)
Age dentists believe that dental organizations in North America recommend a first dental visit	
As soon as the first tooth erupts and no later than 12 months	1863 (59.5)
Between 1 and 2 years	578 (18.5)
After two years and before attending pre-school	130 (4.2)
At 3 years	316 (10.1)
Don't know	244 (7.8)
Ever seen a patient < 12 months of age	
Yes	2324 (74.2)
No	807 (25.8)
Typically see patients < 12 months of age	
Yes	554 (17.7)
No	2577 (82.3)
Do not see patients < 12 months of age, but refer to a colleague who does	
Yes	1303 (55.3)
No	1052 (44.7)
Actively discuss early childhood dental care with your patients?	
Yes	2694 (94.8)
No	149 (5.2)
Provide parents of infants and toddlers with information on how to care for their child's teeth?	
Yes	2688 (94.5)
No	155 (5.5)
Promote early visits for infants and toddlers in your practice?	
Yes	2246 (79.0)
No	597 (21.0)
Think that infant and toddler dental care is a potential growth area for your practice?	
Yes	1421 (50.0)
No	1422 (50.0)
Use "knee to knee positioning "when examining infants and toddlers	
Yes	1659 (61.0)
No	1059 (39.0)

After examining an infant and or toddler for the first time, when do you typically suggest that the child return for their next visit?	
Within six months	1052 (38.7)
Within one year	464 (17.1)
After one year	98 (3.6)
I do not recommend when a child should return	29 (1.1)
Depends on their risk for caries (caries-risk assessment)	1075 (39.5)
Parents adequately understand the importance of a child's first visit to a dentist?	
Yes	651 (24.0)
No	2067 (76.0)
Parents open to the idea of bringing their infant /toddler in for an examination before 12 months of age?	
Very open	379 (14.0)
Neutral	761 (28.0)
Not at all open	330 (12.1)
Don't know	533 (19.6)
Interested with appropriate guidance	715 (26.3)
Important for a child to receive their first dental examination within the first six months of the eruption of the first tooth, or by one year of age	
Agree	1313 (50.9)
Somewhat Agree	583 (22.5)
Neither Agree nor Disagree	355 (13.7)
Somewhat Disagree	218 (8.4)
Disagree	116 (4.5)
Confident in my ability to perform a dental examination on an infant	
Agree	1419 (55.0)
Somewhat Agree	701 (27.1)
Neither Agree nor Disagree	251 (9.7)
Somewhat Disagree	158 (6.1)
Disagree	55 (2.1)
Confident in my ability to perform a dental examination on a toddler	
Agree	1728 (67.6)
Somewhat Agree	604 (23.4)
Neither Agree nor Disagree	138 (5.3)
Somewhat Disagree	77 (2.3)
Disagree	37 (1.4)
Before feel comfortable treating an infant or toddler, would require more training	
Agree	327 (12.7)
Somewhat Agree	543 (21.0)
Neither Agree nor Disagree	659 (25.5)
Somewhat Disagree	429 (16.6)
Disagree	626 (24.2)

Front office staff actively encourages infant and toddler dental care	
Agree	758 (29.4)
Somewhat Agree	690 (26.7)
Neither Agree nor Disagree	714 (27.6)
Somewhat Disagree	275 (10.6)
Disagree	147 (5.7)
Staff is comfortable dealing with infants and toddlers in our dental practice	
Agree	1025 (39.6)
Somewhat Agree	878 (34.0)
Neither Agree nor Disagree	418 (16.2)
Somewhat Disagree	194 (7.5)
Disagree	69 (2.7)
Early childhood dental care represents an opportunity to expand my practice	
Agree	679 (26.3)
Somewhat Agree	589 (22.8)
Neither Agree nor Disagree	749 (29.0)
Somewhat Disagree	306 (11.8)
Disagree	261 (10.1)
Many of the children that visit me in their first year become long-term patients	
Agree	868 (33.7)
Somewhat Agree	740 (28.6)
Neither Agree nor Disagree	797 (30.8)
Somewhat Disagree	94 (3.6)
Disagree	85 (3.3)
Would like to receive (additional) training on how to incorporate early childhood care into my practice	
Agree	636 (24.7)
Somewhat Agree	793 (30.7)
Neither Agree nor Disagree	629 (24.3)
Somewhat Disagree	241 (9.3)
Disagree	285 (11.0)
Aware of CDA's position on First Dental Visit (Early Childhood Care)	
Yes	1634 (64.8)
No	888 (35.2)

Table 3 Association between respondent characteristics and recommended age of first visit

Variable	Mean age recommended (months)	*p*-value	≤ 12 months	>12 months	*p*-value
Province/Territory					
Alberta	20.2 ± 10.3	< **0.0001**•	169 (42.8)	226 (57.2)	< **0.0001***
British Columbia	16.8 ± 9.1		322 (60.8)	208 (39.3)	
Manitoba	17.2 ± 10.6		80 (62.5)	48 (37.5)	
New Brunswick	16.8 ± 9.1		136 (61.8)	84 (38.2)	
Newfoundland and Labrador	23.0 ± 10.7		29 (35.4)	53 (64.6)	
Nova Scotia	19.0 ± 8.5		19 (43.2)	25(56.8)	
Nunavut	21.0 ± 21.2		1 (50.0)	1 (50.0)	
Northwest Territories	12.0 ± 0.0		2 (100.0)	0 (0.0)	
Ontario	22.2 ± 11.2		528 (38.5)	843 (61.5)	
Prince Edward Island	23.7 ± 12.4		12 (37.5)	20 (62.5)	
Quebec	22.4 ±11.1		78 (37.0)	133 (63.0)	
Saskatchewan	21.4 ± 10.2		74 (42.5)	100 (57.5)	
Yukon	19.1 ± 7.3		3 (33.3)	6 (66.7)	
Location					
Census Metropolitan	20.3 ± 10.7	0.62ŧ	720 (45.6)	860 (54.4)	0.85*
Non-census Metropolitan	20.5 ± 10.8		725 (45.2)	878 (54.8)	
Gender					
Male	22.2 ± 10.9	< **0.0001ŧ**	699 (37.4)	1171 (62.6)	< **0.0001***
Female	18.0 ± 10.0		749(56.2)	583 (43.8)	
Years in Practice	r = 0.33	< **0.0001α**	16.2 ± 12.5	24.2 ± 11.9	< **0.0001ŧ**
Type of Dentist					
General Dentist	20.7 ± 10.8	< **0.0001ŧ**	1353 (43.8)	1739 (56.2)	< **0.0001***
Pediatric Dentist	12.6 ± 5.2		95 (86.4)	15 (13.6)	
Type of practice					
Solo private practice	21.7 ± 10.9	< **0.0001**•	519 (38.6)	824 (61.4)	< **0.0001***
Group private practice	20.0 ± 10.7		794(47.9)	863 (52.1)	
Non-private practice	15.7 ± 8.9		135 (66.8)	67 (33.2)	

* Chi-square ŧ t-test • ANOVA α Correlation

Table 4 Association between knowledge, attitude, behaviour, mean age recommended, and recommending first dental visit by 12 months of age

Variables	Mean age recommended (months)	*p*-value	≤ 12 months	>12 months	*p*-value
Age dentists believe that dental organizations in North America recommend a first dental visit					
As soon as the first tooth erupts and no later than 12 months	16.5 ± 9.5	**<0.0001**	1184 (63.8)	671 (36.2)	**< 0.0001**
Between 1 and 2 years	21.6 ± 8.5		162 (28.2)	412 (71.8)	
After two years and before attending pre-school	28.9 ± 8.0		5 (3.9)	124 (96.1)	
At 3 years	31.6 ± 9.3		29 (9.5)	278 (90.6)	
Don't know	28.0 ± 10.4		37 (15.4)	203 (84.6)	
Ever seen a patient < 12 months for an infant/toddler visit?					
Yes	19.3 ± 10.5	**<0.0001**	1149 (49.8)	1160 (50.2)	**< 0.0001**
No	23.5 ± 10.8		268 (33.7)	528 (66.3)	
Typically see a patient < 12 months of age					
Yes	12.3 ± 7.0	**<0.0001**	462 (84.0)	88 (16.0)	**< 0.0001**
No	22.1 ± 10.6		955 (37.4)	1600 (62.6)	
Do not see patients < 12 months of age, but refer to a colleague who does					
Yes	22.2 ± 10.9	0.05438	485 (37.6)	806 (62.4)	**0.0067**
No	22.9 ± 10.3		336 (32.2)	708 (67.8)	
Actively discuss early childhood dental care with your patients?					
Yes	20.5 ± 10.8	**0.00076**	1203 (44.8)	1480 (55.2)	**0.0014**
No	23.8 ± 11.5		45 (31.3)	99 (68.8)	
Provide parents of infants and toddlers with information on how to care for their child's teeth?					
Yes	20.5 ± 10.8	**0.00086**	1200 (44.8)	1477 (55.2)	**0.0021**
No	23.9 ± 11.9		48 (32.0)	102 (68.0)	

Promote early visits for infants and toddlers in your practice?					
Yes	18.2 ± 9.7	**<0.0001**	1168 (52.2)	1068 (47.8)	**< 0.0001**
No	29.9 ± 9.8		80 (13.5)	511 (86.5)	
Use knee to knee positioning when examining infants and toddlers					
Yes	18.2 ± 10.0	**<0.0001**	907 (54.8)	748 (45.2)	**< 0.0001**
No	24.4 ± 10.9		296 (28.2)	753 (71.8)	
Parents adequately understand the importance of a child's first visit to a dentist?					
Yes	23.4 ± 10.9	**<0.0001**	206 (31.7)	443 (68.3)	**< 0.0001**
No	19.7 ± 10.6		997 (48.5)	1058 (51.5)	
Important for a child to receive their first dental examination within the first six months of the eruption of the first tooth, or by one year of age					
Agree	13.6 ± 7.3	**<0.0001**	1006 (76.9)	302 (23.1)	**< 0.0001**
Somewhat Agree	23.4 ± 9.3		132 (22.8)	447 (77.2)	
Neither Agree nor Disagree	29.5 ± 7.8		19 (5.4)	333 (94.6)	
Somewhat Disagree	31.1 ± 7.1		5 (2.3)	213 (97.7)	
Disagree	33.3 ± 7.2		2 (1.7)	114 (98.3)	
Confident in my ability to perform a dental examination on an infant					
Agree	17.8 ± 10.0	**<0.0001**	789 (55.8)	624 (44.2)	**< 0.0001**
Somewhat Agree	22.0 ± 10.5		264 (37.7)	435 (62.3)	
Neither Agree nor Disagree	24.4 ± 10.5		72 (29.0)	176 (71.0)	
Somewhat Disagree	26.5 ± 10.2		35 (21.5)	123 (78.5)	
Disagree	30.3 ± 6.1		5 (9.3)	49 (90.7)	
Confident in my ability to perform a dental examination on a toddler					
Agree	18.8 ± 10.3	**<0.0001**	876 (50.8)	847 (49.2)	**< 0.0001**
Somewhat Agree	22.6 ± 10.5		213 (35.3)	390 (64.7)	
Neither Agree nor Disagree	24.5 ± 11.6		47 (35.6)	89 (65.4)	
Somewhat Disagree	24.6 ± 11.1		24 (31.6)	52 (68.4)	
Disagree	30.8 ± 11.0		4 (11.4)	31 (88.6)	

Front office staff actively encourages infant and toddler dental care.					
Agree	15.4 ± 8.7	**<0.0001**	507 (67.2)	247 (32.8)	**< 0.0001**
Somewhat Agree	20.1 ± 10.1		298 (43.2)	391 (56.8)	
Neither Agree nor Disagree	22.4 ± 10.6		254 (35.7)	458 (64.3)	
Somewhat Disagree	26.0 ± 11.0		74 (27.0)	201 (73.0)	
Disagree	27.3 ± 11.3		32 (22.2)	112 (77.8)	
Staff comfortable dealing with infants and toddlers in our dental practice.					
Agree	17.5 ± 9.9	**<0.0001**	582 (57.1)	438 (42.9)	**< 0.0001**
Somewhat Agree	21.2 ± 10.2		345 (39.3)	532 (60.7)	
Neither Agree nor Disagree	23.1 ± 11.0		151 (36.4)	264 (63.6)	
Somewhat Disagree	24.4 ± 11.7		63 (32.5)	131 (67.5)	
Disagree	24.6 ± 12.7		23 (34.3)	44 (65.7)	
Aware of CDA's position on First Dental Visit (Early Childhood Care).					
Yes	18.3 ± 10.1	**<0.0001**	890 (54.6)	740 (45.4)	**< 0.0001**
No	24.3 ± 10.8		244 (27.7)	638 (72.3)	
Reasons for not seeing patients who are less than one year of age					
Isn't necessary					
Yes	29.7 ± 8.0	**<0.0001**	26 (6.4)	378 (93.6)	**< 0.0001**
No	19.1 ± 10.4		1422 (50.8)	1376 (49.2)	
Do not know how to treat them					
Yes	27.0 ± 10.6	**<0.0001**	34 (21.0)	128 (79.0)	**< 0.0001**
No	20.1 ± 10.7		1414 (46.5)	1626 (53.5)	
Was never taught how					
Yes	28.3 ± 9.8	**<0.0001**	22 (15.8)	117 (84.2)	**< 0.0001**
No	20.1 ± 10.7		1426 (46.6)	1637 (53.4)	
Don't know what to look for					
Yes	27.4 ± 10.0	**<0.0001**	13 (19.4)	54 (80.6)	**< 0.0001**
No	20.3 ± 10.7		1435 (45.8)	1700 (54.2)	
Too busy					
Yes	26.8 ± 10.9	**<0.00015**	9 (18.8)	39 (81.3)	**0.0002**
No	20.3 ± 10.7		1439 (45.6)	1715 (54.4)	
Uncomfortable seeing uncooperative children					
Yes	25.7 ± 10.8	**<0.0001**	102 (23.2)	337 (76.8)	**< 0.0001**
No	19.6 ± 10.5		1346 (48.7)	1417 (51.3)	

Uncomfortable seeing crying children					
Yes	26.9 ± 11.3	**<0.0001**	54 (21.6)	196 (78.4)	**< 0.0001**
No	19.9 ± 10.5		1394 (47.2)	1558 (52.8)	
Few parents see it as a priority and little demand from the public					
Yes	21.9 ± 10.3	**<0.0001**	401 (35.9)	715 (64.1)	**< 0.0001**
No	19.6 ± 10.9		1047 (50.2)	1039 (49.8)	
Associates in my office see them instead					
Yes	24.8 ± 12.0	**0.00158**	24 (32.4)	50 (67.6)	**0.0253**
No	20.3 ± 10.7		1424 (45.5)	1704 (54.5)	
Staff not interested or supportive of seeing young children					
Yes	22.8 ± 11.3	0.14853	10 (38.5)	16 (61.5)	0.4868
No	20.4 ± 10.8		1438 (45.3)	1738(54.7)	

Table 5 Association between variables and type of dentist

Variable	General Dentist N%	Pediatric Dentist N%	*p*-value
Characteristics			
Province/Territory			
Alberta	389 (12.5)	12 (11.0)	0.0608
British Columbia	516 (16.5)	22 (20.0)	
Manitoba	126 (4.0)	3 (2.7)	
New Brunswick	219 (7.0)	3 (2.7)	
Newfoundland and Labrador	82 (2.6)	1 (0.9)	
Nova Scotia	44 (1.4)	0 (0.0)	
Nunavut	2 (0.1)	0 (0.0)	
Northwest Territories	2 (0.1)	0 (0.0)	
Ontario	1328 (42.5)	54 (49.1)	
Prince Edward Island	32 (1.0)	0 (0.0)	
Quebec	200 (6.4)	14 (12.7)	
Saskatchewan	173 (5.5)	1 (0.9)	
Yukon	9 (0.4)	0 (0.0)	
Location			
Census Metropolitan	1491 (48.1)	95 (87.2)	**< 0.0001**
Non-Census Metropolitan	1607 (51.9)	14 (12.8)	
Gender			
Male	1825 (58.5)	64 (58.2)	0.9542
Female	1297 (41.5)	46 (41.8)	
Year of Graduation			
1951-1970	114 (3.8)	9 (8.4)	**0.0024**
1971-1980	481 (16.1)	25 (23.4)	
1981-1990	768 (25.7)	22 (20.6)	
1991-2000	649 (21.7)	26 (24.3)	
2001-2013	972 (32.6)	25 (23.4)	
Years in Practice (Mean ± SD)	20.6 ± 12.8	23.2 ± 11.7	**< 0.0001**
Type of Practice			
Group private practice	1615 (51.7)	56 (51.0)	**<0.0001**
Solo private practice	1321 (42.3)	34 (31.0)	
Non-private practice	186 (6.0)	20 (18.0)	
Age recommend a child should see a dentist (months)? (Mean ± SD)	20.4 ± 10.8	12.6 ± 5.2	**< 0.0001**
Age recommend a child should see a dentist (months)			
≤12 mo	1353 (43.8)	95 (86.4)	**<0.0001**
>12 mo	1739 (56.2)	15 (13.6)	

Age dentists believe that dental organizations in North America recommend a first dental visit			
As soon as the first tooth erupts and no later than 12 months	1775 (58.7)	88 (59.5)	< **0.0001**
Between 1 and 2 years	567 (18.8)	11 (18.5)	
After two years and before attending pre-school	128 (4.2)	2 (4.1)	
At 3 years	311 (10.3)	5 (10.1)	
Don't know	242 (8.0)	2 (7.8)	
Age dentists believe that dental organizations in North America recommend a first dental visit			
≤ 12 months	1775 (58.7)	88 (81.5)	<**0.0001**
> 12 months	1248 (41.3)	20 (18.5)	
Ever seen a patient less than 12 months of age for an infant/toddler visit?			
Yes	2221 (73.5)	103 (95.4)	<**0.0001**
No or don't know	802 (26.5)	5 (4.6)	
Typically see patients under 12 months of age?			<**0.0001**
Yes	483 (16.0)	71 (66.7)	
No or don't know	2540 (84.0)	37 (34.3)	
Do not see patients < 12 months of age, but refer to a colleague who does			
Yes	1296 (55.7)	7 (24.1)	**0.0007**
No	1030 (44.3)	22 (75.9)	
Actively discuss early childhood dental care with your patients?			
Yes	2598 (94.6)	96 (100.0)	**0.0191**
No	149 (5.4)	0 (0.0)	
Promote early visits for infants and toddlers in your practice?			
Yes	2153 (78.4)	93 (96.9)	< **0.0001**
No	594 (21.6)	3 (3.1)	
Use "knee to knee positioning "when examining infants and toddlers			
Yes	1579 (60.1)	80 (87.0)	< **0.0001**
No	1047 (39.9)	12 (13.0)	
Parents adequately understand the importance of a child's first visit to a dentist?			
Yes	637 (24.3)	14 (15.2)	**0.0458**
No	1989 (75.7)	78 (84.8)	

Important for a child to receive their first dental examination within the first six months of the eruption of the first tooth, or by one year of age.			
Agree	1233 (49.4)	80 (89.9)	< **0.0001**
Somewhat Agree	579 (23.2)	3 (3.4)	
Neither Agree nor Disagree	352 (14.1)	3 (3.4)	
Somewhat Disagree	216 (8.7)	2 (2.3)	
Disagree	115 (4.6)	1 (1.0)	
Confident in my ability to perform a dental examination on an infant			
Agree	1333 (53.4)	86 (96.6)	< **0.0001**
Somewhat Agree	700 (28.1)	1 (1.1)	
Neither Agree nor Disagree	249 (10.0)	2 (2.3)	
Somewhat Disagree	158 (6.3)	0 (0.0)	
Disagree	55 (2.2)	0 (0.0)	
Confident in my ability to perform a dental examination on a toddler.			
Agree	1642 (65.8)	86 (96.6)	< **0.0001**
Somewhat Agree	602 (24.1)	2 (2.3)	
Neither Agree nor Disagree	137 (5.5)	1 (1.1)	
Somewhat Disagree	77 (3.1)	0 (0.0)	
Disagree	37 (1.5)	0 (0.0)	
Staff actively encourages infant and toddler dental care.			
Agree	683 (27.4)	75 (84.3)	< **0.0001**
Somewhat Agree	683 (27.4)	7 (7.9)	
Neither Agree nor Disagree	709 (28.4)	5 (5.6)	
Somewhat Disagree	274 (11.0)	1 (1.1)	
Disagree	146 (5.8)	1 (1.1)	
Staff is comfortable dealing with infants and toddlers in our dental practice.			
Agree	943 (37.8)	82 (92.1)	< **0.0001**
Somewhat Agree	873 (35.0)	5 (5.7)	
Neither Agree nor Disagree	417 (16.7)	1 (1.1)	
Somewhat Disagree	193 (7.7)	1 (1.1)	
Disagree	69 (2.8)	0 (0.0)	
Early childhood dental care represents an opportunity to expand my practice.			
Agree	624 (25.0)	55 (61.8)	< **0.0001**
Somewhat Agree	583 (23.4)	6 (6.7)	
Neither Agree nor Disagree	732 (29.3)	17 (19.1)	
Somewhat Disagree	305 (12.2)	1 (1.1)	
Disagree	251 (10.1)	10 (11.3)	

Many children that visit me in their first year become long-term patients.			
Agree	805 (32.3)	63 (70.8)	< **0.0001**
Somewhat Agree	727 (29.1)	13 (14.6)	
Neither Agree nor Disagree	788 (31.6)	9 (10.0)	
Somewhat Disagree	92 (3.7)	2 (2.3)	
Disagree	83 (3.3)	2 (2.3)	
Would like to receive additional training on how to incorporate early childhood care into my practice.			
Agree	625 (25.1)	11 (12.4)	< **0.0001**
Somewhat Agree	785 (31.5)	8 (9.0)	
Neither Agree nor Disagree	608 (24.4)	21 (23.6)	
Somewhat Disagree	234 (9.3)	7 (7.9)	
Disagree	243 (9.7)	42 (47.1)	
Aware of CDA's position of the First Dental Visit (Early Childhood Care).			
Yes	1552 (63.7)	82 (97.6)	< **0.0001**
No	886 (36.3)	2(2.4)	

Table 6 Single predictor logistic regression model for characteristics, behaviour, barriers, and awareness when recommending first visit ≤ 12 months, years in practice (x-axis)

Variable	Regression Coefficient	Odds Ratios	95% CI for Odds Ratios	*p*- Value
Theme 1				
Intercept	-1.03			
Years in practice	0.054	1.06	1.05, 1.06	< **0.0001**
Central Canada Region (reference = Western Canada)	0.63	1.87	1.59, 2.23	< **0.0001**
Eastern Canada Region (reference = Western Canada)	0.065	1.07	0.83, 1.37	0.61
Gender (reference = Female)	-0.42	0.66	0.56, 0.78	< **0.0001**
Type of Dentist (reference = Pediatric Dentist)	-2.57	0.076	0.042, 0.14	< **0.0001**
Group private practice (reference = Solo private practice)	-0.06	0.94	0.80, 1.11	0.48
Non-private practice (reference = Solo private practice)	-1.24	0.29	0.20,0.41	< **0.0001**
Theme 2				
Intercept	-1.84			
Ever seen a patients < 12 months (reference = No)	0.056	1.06	0.85, 1.32	0.62
Typically see a patient < 12 months (reference = No)	1.86	6.40	4.80, 8.53	< **0.0001**
Actively discuss early childhood care with patient (reference = No)	-0.032	0.97	0.59, 1.60	0.90
Provide parents information to care for child's teeth (reference = No)	-0.15	0.86	0.53, 1.41	0.56
Promote early visits (reference = No)	1.12	3.08	2.24, 4.23	<**0.0001**
Use knee to knee positioning (reference = No)	0.75	2.12	1.74, 2.59	<**0.0001**
Parents understand importance of a child's first dental visit (reference = No)	-0.62	0.54	0.43, 0.68	<**0.0001**
Important to have first dental visit six months of eruption of the first tooth, or by age 1 (reference = No)	3.10	22.20	10.25, 48.08	<**0.0001**
Confident to perform infant exam (reference = No)	0.72	2.05	1.45, 2.91	< **0.0001**

Confident to perform toddler exam (reference = No)	-0.58	0.56	0.36, 0.86	**0.008**
Front office staff encourages infant and toddler dental care (reference = No)	0.47	1.60	1.27, 2.00	< **0.0001**
Staff comfortable dealing with infants and toddlers (reference = No)	-0.46	0.63	0.48, 0.82	**0.00066**
Theme 3				
Intercept	6.60			
Isn't necessary (reference = No)	-2.80	0.06	0.04, 0.09	< **0.0001**
Do not know how to treat them (reference = No)	-0.47	0.62	0.40, 0.98	**0.042**
Was never taught how (reference = No)	-0.72	0.49	0.28, 0.85	**0.010**
Don't know what to look for (reference = No)	-0.004	1.00	0.48, 2.09	1.0
Too busy (reference = No)	-0.98	0.38	0.17, 0.82	**0.015**
Uncomfortable seeing un-cooperative children (reference = No)	-0.93	0.40	0.30, 0.52	< **0.0001**
Uncomfortable seeing crying children (reference = No)	-0.28	0.80	0.52, 1.11	0.16
Few parents see it as a priority (reference = No)	-0.61	0.54	0.46, 0.64	< **0.0001**
Associates in my office see them instead (reference = No)	-0.49	0.61	0.36, 1.04	0.07
Theme 4				
Age dentists believe dental organizations in North America recommend first visit (reference = No)	1.85	6.37	5.23, 7.75	< **0.0001**
Aware of CDA's position on First Dental Visit (Early Childhood Care) (reference = No)	0.73	2.07	1.70, 2.51	< **0.0001**

Table 7 Multi-predictor regression model for characteristics, behaviours, and awareness with barriers and without barriers when recommending first visit ≤ 12 months, years in practice (x-axis)

Variable	Regression Coefficient	Odds Ratios	95% CI for Odds Ratios	*p*-value
With barriers				
Intercept	-0.89			
Years in practice	0.03	1.03	1.02, 1.04	< **0.0001**
Central Canada Region (reference = Western Canada)	0.60	1.83	1.44, 2.32	< **0.0001**
Eastern Canada Region (reference = Western Canada)	0.03	1.02	0.72, 1.48	0.87
Gender (reference = Female)	-0.18	0.84	0.66, 1.05	0.13
Type of Dentist (reference = Pediatric Dentist)	-0.95	0.39	0.16, 0.91	**0.03**
Group private practice (reference = Solo private practice)	-0.2	0.82	0.65, 1.03	**0.10**
Non-private practice (reference = Solo private practice)	-1.31	0.27	0.16, 0.47	< **0.0001**
Typically see a patient < 12 months (reference = No)	1.23	3.41	2.41, 4.83	< **0.0001**
Promote early visits (reference = No)	0.98	2.66	1.85, 3.82	< **0.0001**
Use knee to knee positioning (reference = No)	0.36	1.44	1.13, 1.83	**0.003**
Parents understand importance of a child's first dental visit (reference = No)	-0.35	0.71	0.54, 0.93	**0.015**
Important to have first dental visit six months of eruption of the first tooth, or by age 1 (reference = No)	2.96	19.32	8.2, 45.71	< **0.0001**
Confident to perform infant exam (reference = No)	0.77	2.15	1.44, 3.23	**0.0002**
Confident to perform toddler exam (reference = No)	-0.84	0.43	0.26, 0.72	**0.0014**
Front office staff encourages infant and toddler dental care (reference = No)	0.57	1.76	1.34, 2.31	< **0.0001**

Staff is comfortable dealing with infants and toddlers in our dental practice (reference = No)	-0.4	0.67	0.49, 0.92	**0.014**
Isn't necessary (reference = No)	-1.23	0.29	0.18, 0.49	< **0.0001**
Uncomfortable seeing un-cooperative children (reference = No)	-0.49	0.61	0.43, 0.87	**0.007**
Few parents see it as a priority (reference = No)	-0.40	0.67	0.52, 0.85	**0.0013**
Age dentists believe dental organizations in North America recommend first visit (reference = No)	1.66	5.28	4.13, 6.76	< **0.0001**
Aware of CDA's position of First Dental Visit (Early Childhood Care) (reference = No)	0.38	1.47	1.15, 1.88	**0.002**
Without barriers				
Intercept	-3.02			
Years in practice	0.03	1.03	1.02, 1.04	< **0.0001**
Central Canada Region (reference = Western Canada)	0.64	1.89	1.5, 2.4	< **0.0001**
Eastern Canada Region (reference = Western Canada)	0.024	1.02	0.72, 1.47	0.9
Gender (reference = Female)	-0.23	0.79	0.63, 0.99	**0.045**
Type of Dentist (reference = Pediatric Dentist)	-0.93	0.4	0.17, 0.9	**0.03**
Group private practice (reference = Solo private practice)	-0.24	0.79	0.62, 0.99	**0.04**
Non-private practice (reference = Solo private practice)	-1.39	0.25	0.15, 0.43	< **0.0001**
Typically see a patient < 12 months (reference = No)	1.60	4.78	3.46, 6.6	< **0.0001**
Promote early visits (reference = No)	1.04	2.83	1.98, 4.06	< **0.0001**
Use knee to knee positioning (reference = No)	0.40	1.5	1.18, 1.9	**0.00083**

Parents understand importance of a child's first dental visit (reference = No)	-0.33	0.72	0.55, 0.94	**0.017**
Important to have first dental visit six months of eruption of the first tooth, or by age 1 (reference = No)	3.16	23.6	10.1, 55.2	< **0.0001**
Confident to perform infant exam (reference = No)	0.75	2.12	1.4, 3.2	**0.00021**
Confident to perform toddler exam (reference = No)	-0.79	0.46	0.27, 0.76	**0.0024**
Front office staff encourages infant and toddler dental care (reference = No)	0.60	1.84	1.4, 2.4	< **0.00011**
Staff is comfortable dealing with infants and toddlers in our dental practice (reference = No)	-0.35	0.7	0.51, 0.96	**0.03**
Age dentists believe dental organizations in North America recommend first visit (reference = No)	1.7	5.41	4.25, 6.9	< **0.0001**
Aware of CDA's position of First Dental Visit (Early Childhood Care) (reference = No)	0.39	1.48	1.16, 1.88	**0.0017**

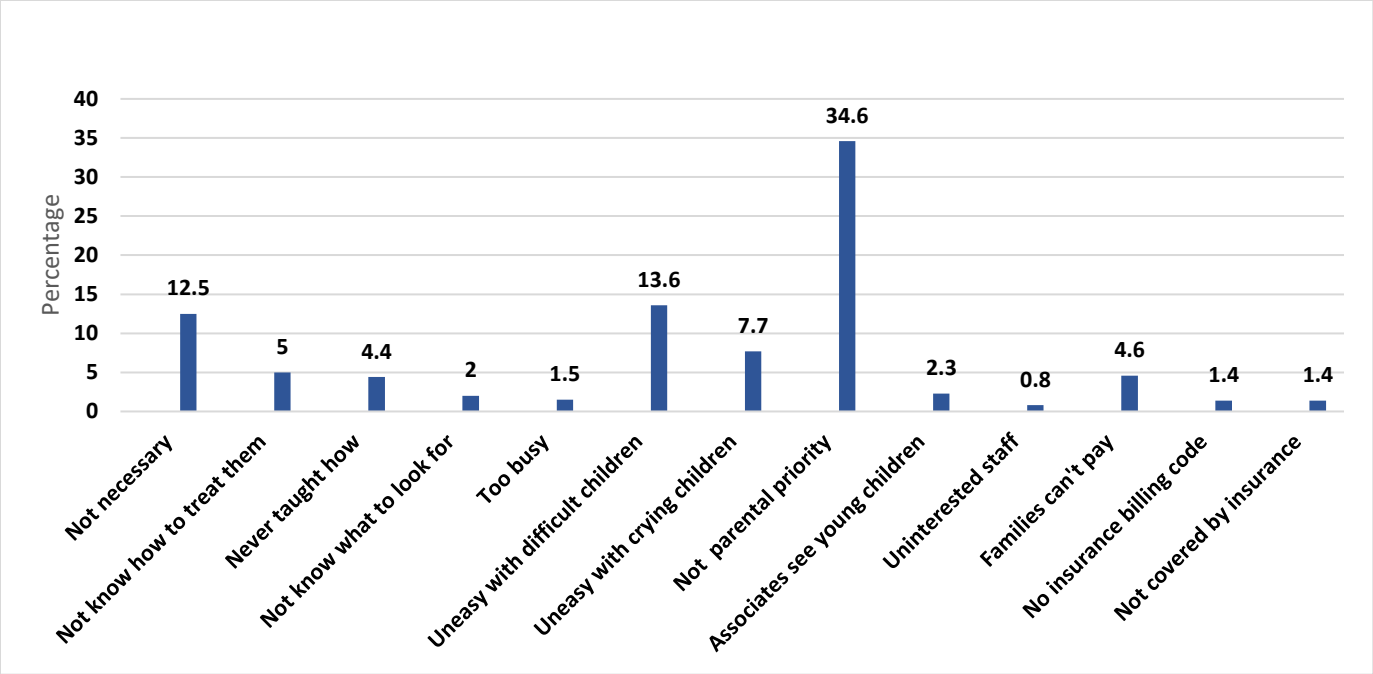


Figure 1A Reasons responding dentists reported for not seeing patients ≤ 12 months of age

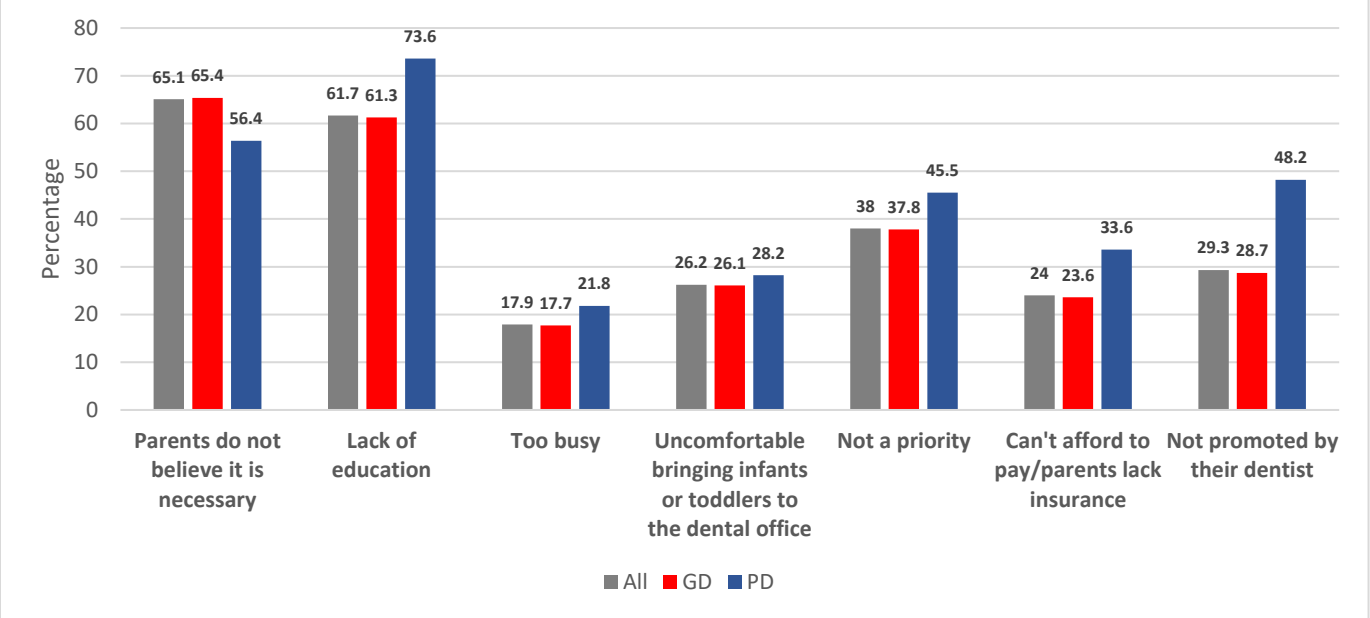
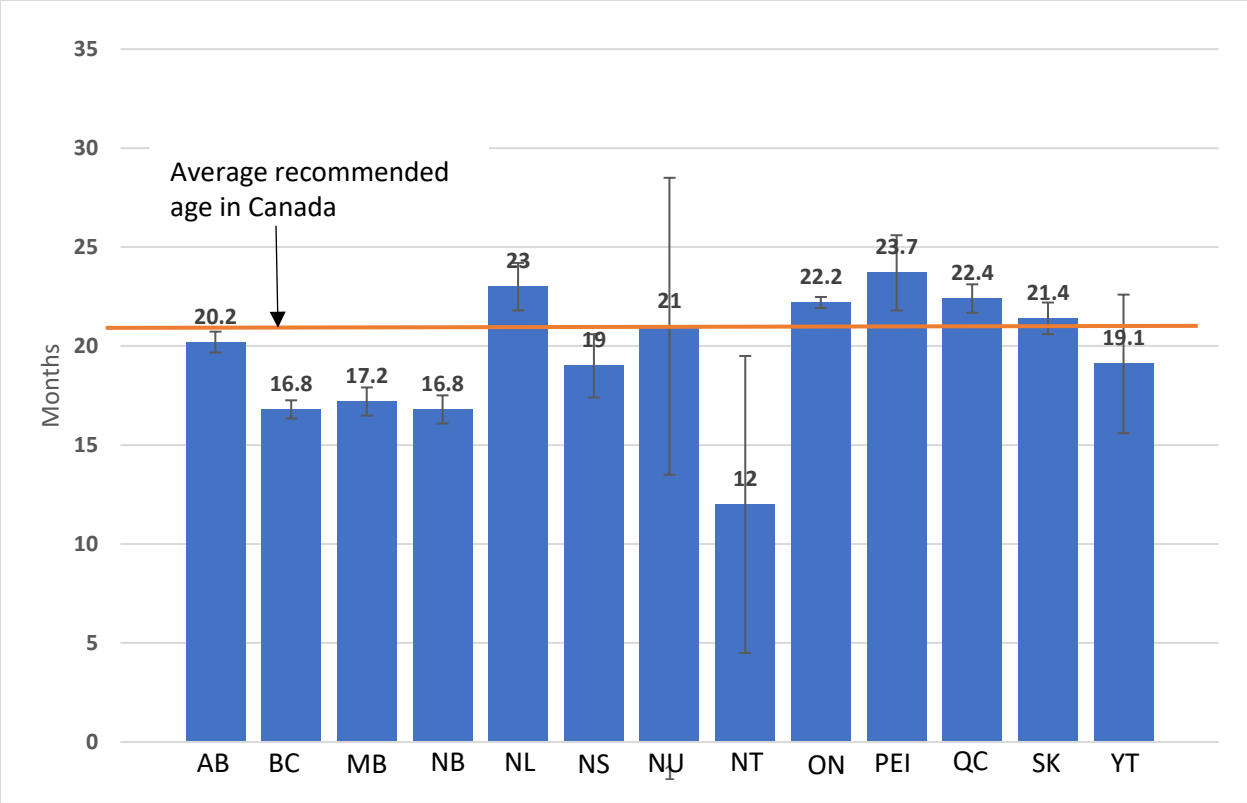


Figure 1B Reasons dentists gave why parents did not bring their infants/toddlers for first visit



ANOVA ***p*-value <0.0001**

Figure 2 Mean age recommended (months) by provinces/territories

KEYWORDS: American Academy of Pediatric Dentistry (AAPD), Canadian Dental Association (CDA), Early Childhood Caries (ECC), Free First Visit (FFV), Manitoba Dental Association (MDA), Provincial Dental Association (PDA)

INTRODUCTION:

Early childhood caries (ECC) is a prevalent public health issue worldwide with a mean prevalence of 23.8% in children younger than 36 months and 57.3% in children between ages 3-6 years (1). In fact, published studies reveal that in Canada, the prevalence of ECC may be as high as 90% in some parts of the country (2). If left untreated, ECC can have negative consequences on a child's well-being and lead to a lower quality of life, often resulting in pain, failure to thrive, behavioral problems and an inability to eat, speak and learn (3).

First dental visits may help prevent against ECC by identifying high-risk children before significant problems arise (4,5,6). The prevention of oral disease is preferred over the surgical treatment of the disease in children (6). However, dental surgery to treat severe ECC is the most common surgical procedure in preschool children at most Canadian pediatric and community hospitals (7).

Current established professional organizations recommend a first visit no later than 12 months of age (7). Unfortunately, first visit dental visits are atypical (8, 9). One recent study reported that < 1% of healthy, urban, Canadian children visit the dentist by age one and 1.9% by age two (7,9).

The establishment of the dental home by age one should be encouraged and has proven to be effective (7,8,10). This helps parents develop proper oral health habits early in their child's life, rather than trying to change established unhealthy habits later (11). Early prevention in dental care can reduce the need for restorative appointments and visits to the emergency room, while also decreasing costs (9, 10, 12).

Early visits may be more common in certain regions of Canada where there have been campaigns on the first visit (13). These visits set children on the proper trajectory for a lifetime of optimal oral health. The concept may seem new to some, but in 1986, the American Academy of Pediatric Dentistry (AAPD) first published "Infant Oral Health Guidelines" and recommended an oral examination and assessment within six months of the eruption of the first tooth and no later than 12 months of age (4). This recommendation is 35 years old and may not be known by

all practicing dentists. The Canadian Dental Association (CDA) parallels the AAPD statement and also endorses a first visit by 12 months of age (7).

While information is available on the views and practice patterns of Manitoba dentists, there is no published national data on Canadian dentists' views and attitudes on early childhood dental visits. The purpose of this study is to assess the knowledge, attitudes and behaviours of dentists in Canada regarding the timing of the first dental visit and the importance of developing a positive relationship between the child, family and dental team.

METHODS:

In 2013, the CDA undertook a national survey of its members, as the first dental visit was one of two priority areas identified by the CDA's Access to Care Working Group. General and pediatric dentists received an email invitation to complete an electronic survey, which collected their demographic and practice characteristics. The dentists were questioned about their knowledge, attitudes, and behaviours regarding the timing of the first dental visit and early childhood oral health. In particular, the survey covered a wide range of topics, including dentists' awareness and knowledge of infant and toddler dental care and timing of the first dental visit, knowledge of CDA and Provincial Dental Association (PDA) positions on the first visit, best practices, and views on ECC. There were also questions regarding the attitudes of dental office staff, views on communication and education, and whether infants and toddlers were a possible growth area for dental practices.

A 45-question online survey was conducted by Navigator Ltd., an independent research and strategy firm contracted by CDA. The survey was emailed on January 16, 2013 to 14,747 general and pediatric dentists whose email addresses were on record with the CDA. A timeline of two weeks was provided to participants with a deadline set for January 31, 2013. To increase the number of respondents, two follow-up emails were sent. Specific objectives of the survey were to 1) determine the average recommended age for a first dental visit by responding Canadian dentists; 2) determine which factors and provider characteristics were associated with earlier recommended first visits and the 12-month milestone; and 3) support the CDA's efforts to advocate on behalf of the dental profession to promote optimal oral health for Canadians and the specific goal to reduce the incidence of ECC.

The CDA provided approval and data for the secondary analysis of survey data. Ethics approval was obtained from the University of Manitoba's Health Research Ethics Board. The

key outcome variable was the age dentists recommended for a first dental visit and the proportion who recommended first visit ≤ 12 months. The first variable of interest was the province of practice: Alberta, British Columbia, Manitoba, Nova Scotia, New Brunswick, Newfoundland and Labrador, Nunavut, Northwest Territories, Ontario, Prince Edward Island, Quebec, Saskatchewan, and Yukon. The next variable was the location of their practice: census metropolitan or non-census metropolitan. Census metropolitan was defined as having a total population of at least 100,000 of which 50,000 or more live in the urban core. Non-census metropolitan areas are smaller urban areas with a population of less than 100,000 (14).

Other covariates included gender, year of graduation, type of dentist, and type of practice. The key outcome was dichotomized into those who recommended a first visit ≤ 12 months of age and those recommending > 12 months for first visit. Provinces and territories were grouped into Western, Central, and Eastern Canada. The types of practice were recoded into solo, group and non-private practice.

The anonymized database which was provided to the current research team by the CDA was recoded in Excel™ (Microsoft Office 2016). Data were analyzed using Number Cruncher Statistical Software™ (Version 20.0.2, Kaysville, Utah). Descriptive statistics (means, standard deviations (SD), and frequencies) were calculated. Associations between participant characteristics and age of first visit recommended by dentists were evaluated by Chi-square for categorical variables and t-tests and analysis of variance (ANOVA) for continuous variables. Correlation models were used to examine the dependent variables of number of years in practice and age that dentists recommend for first visit. Multiple logistic regression with forward stepwise selection was used. A p-value of ≤ 0.05 was significant.

RESULTS:

A total of 3,232 dentists participated, yielding a response rate of 21.9%. Characteristics of participants appear in Table 1. The majority were general dentists (96.6%), male (58.5%), from Ontario (42.6%), living in a non-census metropolitan area (50.5%), working in group private practice (51.7%), who practiced for an average of 20.6 ± 12.8 years.

Table 2 presents data on participants' knowledge, attitudes, and behaviours relating to the first dental visit. The average age they personally recommended was 20.4 ± 10.8 months. Less than half (45.2%) of respondents recommended a first dental visit by 12 months of age. When asked at what age dental organizations recommended a child's first dental visit, 59.5% responded

as soon as the first primary tooth erupts. Additionally, 64.8% were aware of the CDA's position on the first dental visit. The majority (74.2%) reported that they had seen a patient under 12 months of age, but only 17.7% typically did so. Of those who did not see children ≤ 12 months, 55.3% indicated that they refer them to a colleague who does. The majority (61.0%) used "knee-to-knee positioning" when examining infants and toddlers. Most respondents (76.0%) felt that parents do not adequately understand the importance of a child's first visit to a dentist and only 14% felt that parents are open to bringing their infants and toddlers for a first dental visit.

Overall, 73.4% agreed or somewhat agreed that it is important for a child to receive their first dental examination within six months of the eruption of the first tooth, or by 12 months of age. A vast majority (82.1%) agreed or somewhat agreed that they were confident in their ability to perform an infant dental examination and 91.0% with toddlers. One third (33.7%) agreed or somewhat agreed that they would require additional training before they felt comfortable treating infants and toddlers. To have their staff more comfortable dealing with infants and toddlers, 51.6% requested pamphlets and other educational material, while 44.6% requested more education. Information in printed format was preferred by 53.9% of dentists, while 42.5% preferred it electronically. When asked what would help their practice begin seeing infants and toddlers, they indicated that they would like continuing education events (35.4%), educational material (34.7%) and hands-on training (20.5%).

The three most common reasons that dentists gave for not seeing patients < 12 months of age, included that few parents saw it as a priority (34.6%), that they were uncomfortable seeing difficult children (13.6%), and that they felt it was not necessary to see children (12.5%) (Fig 1A). The three main reasons dentists gave for parents not bringing their child to the dentist within the first year were that parents did not think it was necessary (65.1%), parents lacked education and awareness (61.7%), and that parents did not see it as a priority (38.0%) (Fig. 1B).

Table 3 reports on respondent characteristics by whether they recommended a first visit ≤ 12 months or > 12 months and the overall mean age they recommended for first visit. Participants from the Northwest Territories (100%), Manitoba (62.5%), New Brunswick (61.8%), and British Columbia (60.8 %) had the highest percentages of dentists recommending the correct age. Figure 2 reports the mean age recommended by respondents by province or territory showing significant variation between the provinces.

Female dentists were significantly more likely to recommend first visit ≤ 12 months than their male colleagues (56.2% vs. 37.4%, p<0.0001). They also recommended younger ages than male dentists (18.0± 10.0 months vs. 22.2 ± 10.9 months, p<0.0001). Dentists who recommended first visits by 12 months of age were practicing for significantly fewer years than those who were recommending over 12 months of age (16.2 ± 12.5 vs. 24.2 ± 11.9, p<0.0001).

Similar to the female dentists, pediatric dentists were also significantly more likely to recommend a visit by 12 months of age than general dentists (86.4% vs. 43.8%, p<0.0001). Pediatric dentists recommended a significantly younger age for a first visit than general dentists (12.6 ± 5.2 months vs. 20.7 ± 10.8, p<0.0001). General dentists who were in non-private practice (community, hospital, or university-based) recommended first visit closer to the correct age (15.7 ± 9.0) compared to dentists who were in solo (21.7 ± 10.9) or group practice (20.0 ± 10.7, p<0.0001).

Table 4 reports on the respondents' knowledge, attitudes, behaviours, and the mean age they were recommending for first visit. The dentists were dichotomized into whether they were recommending a first visit ≤ 12 months of age or > 12 months. Overall, 63.8% of dentists who knew the age that dental organizations in North America recommend a first visit, did so in practice themselves. If they had ever seen a patient < 12 months of age, about half (49.8%) recommended first visit ≤ 12 months. If they typically saw a patient < 12 months, 84.0% recommended first visit ≤ 12 months. The dentists who used "knee-to-knee positioning" were significantly more likely to recommend ≤ 12 months (54.8% vs. 28.2%, p<0.0001). The majority of dentists who agreed it was important for a child to receive their first dental examination within the first six months of the eruption of the first tooth, or by one year of age (76.9%) recommended ≤ 12 months for first visit.

Dentists who recommended visits ≤ 12 months reported more confidence in their ability to perform an exam on an infant than those who recommend first visit > 12 months (55.8% vs. 44.2%, p<0.0001). Similarly, those dentists recommending ≤ 12 months reported more confidence in their ability to perform an exam on a toddler than those recommending > 12 months (50.8% vs. 49.2%, p<0.0001). The dentists who recommend first visit ≤ 12 months agreed that their front staff encouraged infant and toddler dental care (67.2%) and their staff was comfortable dealing with infant and toddlers (57.1%). More of the dentists who recommended

first visit ≤ 12 months were aware of CDA's position on first dental visit compared to those who recommended first visit > 12 months (54.6% vs 45.4%, p<0.0001).

Pediatric dentists shared two of the same characteristics as their overall cohort of responding dentists (Table 5). They were mostly from Ontario (49.1%, p<0.06) and mostly male (58.2%, p<0.95). More pediatric dentists practiced in census metropolitan areas compared to general dentists (87.2% vs. 48.1%, p<0.0001). Pediatric dentists were in practice longer than general dentists (23.2 ± 11.7 years vs. 20.6 ± 12.8, p<0.0001). They were more likely to be in non-private practice such as university or hospital-based practice than general dentists (18% vs. 6.0%, p<0.0001). Pediatric dentists recommended first dental visits closer to the correct age in months compared to the general dentists (12.6 ± 5.2 vs. 20.5 ± 10.8, p<0.0001). Most pediatric dentists knew the correct age that dental organizations were recommending for first visit compared to general dentists (81.5% vs 58.7%, p<0.0001). Pediatric dentists typically saw patients under 12 months (66.7% vs. 16.0%, p<0.0001), used "knee-to- knee positioning" (87.0% vs. 60.1%, p<0.0001) and were confident in seeing infants in higher proportions than general dentists (96.6% vs. 53.4%, p<0.0001). The pediatric dentists' staff were also extremely comfortable dealing with infants and toddlers compared to general dentists' staff (92.1% vs.37.8%, p<0.0001).

Variables found to be significantly associated with recommending first visits ≤ 12 months of age were grouped into four different themes and were analyzed using multiple logistic regression. The four theme models included dentists' characteristics, their behaviours, barriers they encountered, and their awareness of their dental organizations' position on the first visit (Table 6).

The first theme model (characteristics) included five covariates and revealed that years in practice, location in Central Canada, female gender, type of dentist (pediatric dentist), and working in solo private practice were significantly associated with recommending first visit by 12 months.

The second theme model (behaviour) included 12 variables. Nine out of the 12 variables were significantly associated with recommending first visit by 12 months. The significant variables were if the dentists typically saw a patient < 12 months, promoted early visits, used "knee to knee positioning", felt parents understood the importance of a child's first visit and if the dentist felt it was important for a child to receive their first dental examination within 6

months of the eruption of the first tooth, or by age one. Other significant variables were if they felt confident to perform infant and toddler exam, if their front staff encouraged infant and toddler dental care, and if their staff was comfortable dealing with infants and toddlers.

The third theme model (barriers) included nine variables. The variables that were significantly associated with recommending first visit by 12 months were if the dentist did not think it was necessary to see a child less than one year of age, if the dentist did not know how to treat infants, if the dentist was never taught how, if the dentist was too busy, if the dentist was uncomfortable seeing uncooperative children, and if the dentists thought that few parents saw the first visit as a priority.

The fourth model (awareness) included two variables. It revealed that the age dentists believe dental organizations in North America recommend first visit and their awareness of the CDA's position of first dental visit were significantly associated with recommending first visit by 12 months.

A final multiple logistic regression model was constructed using forward selection (Table 7), which included those variables that were significant in exploratory themes one, two and four along with the top three significant barriers from the third theme. Results revealed that those who practiced in Central Canada were 1.83 times more likely to recommend first visit by age one than participants in Western Canada. The odds ratio of general dentists recommending first visit by 12months was reduced by 61% compared to pediatric dentists. Dentists who typically saw a patient ≤12 months were 3.41 times more likely to recommend first visit by 12 months. Participants who felt it was important to have first dental visit within six months of eruption of the first tooth, or by age one, were 19.32 times more likely to recommend first visit by age 12 months. If their front staff actively encouraged infant and toddler dental care, they were 1.76 times more likely to recommend first visit by age 12 months. Participants who correctly knew what age dental organizations in North America recommended first visit were 5.28 times more likely to recommend first visit by 12 months.

A second final model excluded the barrier variables from the forward regression model (Table 7). In this last model, gender and group private practice became significant. All other significant variables remained the same as in the forward regression model that included the barrier variables.

DISCUSSION:

Dental organizations have been promoting first visits by age one for many years. The first official North American policy statement on the concept of the dental home and first visit within the first year (12 months) was published 35 years ago. There has been limited research regarding dentists' knowledge, attitudes, and behaviours on the first visit (5). This study investigated Canadian dentists' views on the timing of a child's first dental visit, which is an important dental milestone that often occurs well beyond the recommended age.

The literature shows that there are benefits of early visits with the establishment of the dental home by identifying high-risk patients and providing early prevention (15). There is growing recognition for the need to shift from treating caries to oral health management and primary prevention, which can be best started with the infant at the time of the eruption of the first tooth (4).

The CDA developed the "First Visit, First Tooth" campaign to raise public awareness and to educate dentists (16). Although all PDAs follow the CDA's position on the timing of the first visit, Manitoba and Prince Edward Island are the only two provinces that promote the Free First Visit (FFV) (17,18,19). The MDA started the FFV program in 2010 to promote access to care and to encourage the idea of a dental visit within the first year (12 months) (18,19).

When dentists were asked at what age their dental organizations recommended for the first visit, most responded as soon as the first primary tooth erupts, but when surveyed, dentists recommended a higher age, 20.4 ± 10.8 months, for first visit. There was a disconnect between the knowledge that dentists had with regards to the age of first visit and the age which they recommended. This is consistent with other studies (5,8,18,19,20,21,22,23,24,25,26,27,28). Guidelines give information, but do not always cause behaviours to change (23). The earlier visit recommendation is preparing dentists to see these children before their first birthday. It is encouraging that most practitioners in this study have seen children ≤ 12 months, but in reality, less than one-fifth of the dentists surveyed see one regularly.

With the introduction of the FFV in Manitoba, dentists appeared to be more aware of the timing of the first dental visit and early childhood oral health (23). A study conducted in 2008 found that Manitoba dentists recommended a mean age of 24.8 ± 10.9 months for first visit (8). Following the introduction of the FFV program which was launched by the Manitoba Dental Association (MDA) in 2010, a study conducted on Manitoba dentists found that they had begun

recommending a younger age for first visit (mean 18.1 ± 10.0 months) (18,19). According to this survey from 2013, Manitoba dentists were recommending a mean age of 17.2 ± 10.6 months for first visit. The mean age may have dropped due to the promotion of earlier visits by the MDA and the greater awareness of Manitoba dentists as a result.

In the Manitoba study, it was found that a high number of dentists responded that parents did not see the first visit as a priority and that there was little demand for it (23). This is a significant barrier, as parents need to be educated, informed and engaged in their children's oral health. The first step for parents is to bring their child to the dentist within the first year (12 months) (22,23). When parents acquire more informal education about the first visit, they will then be able to request first visits and dentists will have the opportunity to provide this service. Early childhood education programs can also improve dental care use, especially the use of preventive dental services among infants and toddlers at risk for dental disease (29).

Dentists had barriers for not seeing infants and toddlers in their practice. They reported that they were uncomfortable examining children who were uncooperative and crying. Some felt that the first visit by 12 months was not necessary, which was consistent with other studies (8,18,19,30,31).

Dentists requested additional training for seeing infants in the form of continuing education events, educational material and hands-on training (8,23). The literature suggests that strategies such as professional education, journal articles and advertising can help increase the awareness for both the providers and parents (23).

Female dentists surveyed recommended younger ages for first visit when compared to male dentists. This matches the literature and other studies done on the first visit, which also report that female clinicians are more inclined to recommend first visits within the first year (12 months) (23,30).

Dentists who recommended first visit < 12 months were practicing for a shorter amount of time, which suggests that the longer they are in practice, the older is the age they recommend for first visit. This was also found in other studies (8,21,22,30). Here, results showed that more dentists in non-private practice recommended a visit within the first year (12 months) than those in solo or group practices. This could be because the non-private dentists worked in a hospital or university-based clinic and may have been more aware of the timing of the first dental visit due to their academic affiliations.

Due to the nature of their training, Canadian pediatric dentists in this study recommended the earlier age for first visit. Pediatric dentists knew the correct age to recommend first visit, used the "knee-to-knee positioning" to examine infants and toddlers and their staff were more comfortable dealing with this young population. This was similar to other studies (5,24).

The dental team should be trained in behaviour management techniques because the staff is an extension of the dentist and an integral part of the dental team who work together to communicate with the child. A collaborative approach helps assure that both the patient and the parent have a positive dental experience. All dental team members are encouraged to expand their skills and knowledge through dental literature, video presentations, and continuing education courses (32).

Key predictors for a practitioner to recommend first visit within the first year (12 months) were if the practitioner worked in Central Canada, was female, was a pediatric dentist, worked in solo private practice, and typically saw patients < 12 months. If dentists used the "knee-to-knee positioning" technique which is the recommended method of examining infants and toddlers, there was a higher chance that they would examine this youngest patient population before their first birthday (33,34). Other predictors were if the practitioner promoted early visits, knew the importance of having a first visit within the first year (12 months), thought the first visit was necessary, knew the age dental organizations in North America recommend a first visit, and if their front office staff encouraged infant and toddler dental care.

In the last model, gender became significant only after the barriers were removed from the model. This significant finding may suggest that male dentists have barriers to early childhood visits. It is noted that the number of male respondents was greater than female respondents in the original data set, and trends in gender diversity of past dental graduation classes may also serve as a compounding factor. Group private practice also became significant in the last model. Practitioners in these types of practices may also have barriers in examining infants and may rely on other providers in their practice to see them.

In a study from 2015 conducted in Canada, many, but not all dental professional programs teach the recommended age for a first dental visit. One way we can get through to dentists, especially general dentists, is to change what we teach them. We must ensure that dental schools teach infant oral health, adhere to national guidelines, remove current barriers to

teaching and provide students with opportunities to see infants and toddlers in their undergraduate learning years (5,23,25,30,35). This can be achieved through specialty clinics and community-based clinics, or having dental students practice first visit on an infant of a volunteer parent.

There are not enough pediatric dentists in Canada to see every young child and be a provider for their first visit. As the majority of dental practitioners are general dentists, they will need to develop their skills in order to help fulfill the CDA's vision and position on the timing of the first visit. The CDA should consider targeting its educational campaigns to dentists in Eastern and Western Canada, male dentists, general dentists and those in group private practice to better influence them in recommending dental visit within the first year (12 months). Future research will help determine the impact of the first dental visit by age one campaigns and whether this will lead to a reduction in ECC and prevalence rates of dental surgeries (24).

This study is not without limitations. While 3,232 dentists participated, the response rate was modest. Additionally, recall and response bias were possible. It is also likely that those responding to the survey were most interested in the topic and were already seeing younger patients. Therefore, the findings may not be entirely representative of the average Canadian dentist. The strengths were that it is the first national survey of CDA members regarding timing of first dental visit and there was a large sample size.

CONCLUSIONS:

More than half of dentists in this survey did not recommend first dental visit by 12 months even though this is the CDA's position. Associations observed between provider characteristics and recommending early visits included practicing in Central Canada, being female, being a pediatric dentist, and working in solo private practice. Results of this study can guide targeted educational campaigns for practicing providers and those in training. This study will serve as a baseline for future changes in dentists' practice knowledge, attitudes, and behaviours and will hopefully be instrumental in children being seen at an earlier age.

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