

CLINICAL INVESTIGATIONS

Predicting Severe Pain after Root Canal Therapy in the National Dental PBRN

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Appendix

Appendix Table.

Association of Characteristics with Severe Worst Postoperative Pain Intensity

Characteristic	Overall	Worst Intensity of Tooth Pain in Past Week		P Value ^a
		≥7 (Severe)	<7	
Study Region and Practitioner Specialty Status				
Dentist's training specialty				
General practitioner	267 (41.0)	58 (21.7)	209 (78.3)	0.23
Endodontist	385 (59.0)	69 (17.9)	316 (82.1)	
Region				
AL (<i>n</i> = 98)	93 (14.3)	19 (20.4)	74 (79.6)	0.73
FL (<i>n</i> = 131)	130 (19.9)	20 (15.4)	110 (84.6)	
MN (<i>n</i> = 390)	341 (52.3)	69 (20.2)	272 (79.8)	
PDA (<i>n</i> = 36)	35 (5.4)	8 (22.9)	27 (77.1)	
SK (<i>n</i> = 53)	53 (8.1)	11 (20.8)	42 (79.2)	
Demographics				
Age, y				
Mean (SD)	48.6 (12.5)	46.8 (11.9)	49.0 (12.7)	0.0766
Median	50.0	47.0	50.0	0.0619
Missing	11	0	11	
Sex				
Male	261 (40.5)	45 (17.2)	216 (82.8)	0.23
Female	383 (59.5)	82 (21.4)	301 (78.6)	
Missing	8	0	8	

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Appendix Table.
(continued)

Characteristic	Overall	Worst Intensity of Tooth Pain in Past Week		P Value ^a
		≥7 (Severe)	<7	
Race or ethnicity				
Non-Hispanic white	561 (87.8)	111 (19.8)	450 (80.2)	0.88
Other	78 (12.2)	16 (20.5)	62 (79.5)	
Missing	13	0	13	
Socioeconomic Status				
Household income				
≥\$50,000	408 (65.6)	79 (19.4)	329 (80.6)	
<\$50,000	214 (34.4)	42 (19.6)	172 (80.4)	
Missing	30	6	24	1.00
Highest education				
College or higher	341 (53.0)	72 (21.1)	269 (78.9)	0.37
Less than college	303 (47.0)	55 (18.2)	248 (81.8)	
Missing	8	0	8	
Dental insurance				
Yes	525 (81.1)	108 (20.6)	417 (79.4)	0.25
No	122 (18.9)	19 (15.6)	103 (84.4)	
Missing	5	0	5	
Pain Intensity				
Pain intensity now				
Mean (SD)	2.7 (2.9)	4.3 (3.2)	2.3 (2.7)	<0.0001
Median	2.0	4.0	1.0	<0.0001
Missing	10	2	8	
Pain intensity now				
No pain	231 (36.0)	28 (12.1)	203 (87.9)	<0.0001
Mild	190 (29.6)	23 (12.1)	167 (87.9)	
Moderate	129 (20.1)	40 (31.0)	89 (69.0)	
Severe	78 (12.1)	26 (33.3)	52 (66.7)	
Most severe possible	14 (2.2)	8 (57.1)	6 (42.9)	
Missing	10	2	8	
Worst pain intensity				
Mean (SD)	5.3 (3.8)	6.9 (3.3)	4.9 (3.8)	<0.0001
Median	7.0	8.0	6.0	<0.0001
Missing	13	3	10	
Worst pain intensity				
No pain	154 (24.1)	16 (10.4)	138 (89.6)	<0.0001
Mild	71 (11.1)	5 (7.0)	66 (93.0)	
Moderate	92 (14.4)	16 (17.4)	76 (82.6)	
Severe	226 (35.4)	63 (27.9)	163 (72.1)	
Most severe possible	96 (15.0)	24 (25.0)	72 (75.0)	

(continued)

Appendix Table.
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Characteristic	Overall	Worst Intensity of Tooth Pain in Past Week		P Value ^a
		≥7 (Severe)	<7	
Missing	13	3	10	
Average pain intensity				
Mean (SD)	4.1 (3.2)	5.5 (3.1)	3.8 (3.2)	<0.0001
Median	4.0	6.0	4.0	<0.0001
Missing	12	2	10	
Average pain intensity				
No pain	162 (25.3)	16 (9.9)	146 (90.1)	<0.0001
Mild	118 (18.4)	17 (14.4)	101 (85.6)	
Moderate	185 (28.9)	41 (22.2)	144 (77.8)	
Severe	143 (22.3)	37 (25.9)	106 (74.1)	
Most severe possible	32 (5.0)	14 (43.8)	18 (56.3)	
Missing	12	2	10	
Pain Qualities				
Dull				
Yes	168 (26.3)	33 (19.6)	135 (80.4)	1.00
No	472 (73.8)	93 (19.7)	379 (80.3)	
Missing	12	1	11	
Sharp				
Yes	173 (27.0)	49 (28.3)	124 (71.7)	0.0011
No	467 (73.0)	77 (16.5)	390 (83.5)	
Missing	12	1	11	
Aching				
Yes	263 (41.1)	68 (25.9)	195 (74.1)	0.0012
No	377 (58.9)	58 (15.4)	319 (84.6)	
Missing	12	1	11	
Throbbing				
Yes	237 (37.0)	65 (27.4)	172 (72.6)	0.0002
No	403 (63.0)	61 (15.1)	342 (84.9)	
Missing	12	1	11	
Burning				
Yes	18 (2.8)	3 (16.7)	15 (83.3)	1.00
No	622 (97.2)	123 (19.8)	499 (80.2)	
Missing	12	1	11	
Shooting				
Yes	128 (20.0)	35 (27.3)	93 (72.7)	0.0181
No	512 (80.0)	91 (17.8)	421 (82.2)	
Missing	12	1	11	
Electric				
Yes	38 (5.9)	8 (21.1)	30 (78.9)	0.83

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Appendix Table.
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Characteristic	Overall	Worst Intensity of Tooth Pain in Past Week		P Value ^a
		≥7 (Severe)	<7	
No	602 (94.1)	118 (19.6)	484 (80.4)	
Missing	12	1	11	
Pain starts spontaneously				
Yes	296 (46.3)	79 (26.7)	217 (73.3)	<0.0001
No	343 (53.7)	47 (13.7)	296 (86.3)	
Missing	13	1	12	
Pain is provoked				
Yes	314 (49.1)	72 (22.9)	242 (77.1)	0.0472
No	325 (50.9)	54 (16.6)	271 (83.4)	
Missing	13	1	12	
Pain never gets worse				
Yes	33 (5.1)	4 (12.1)	29 (87.9)	0.37
No	608 (94.9)	121 (19.9)	487 (80.1)	
Missing	11	2	9	
Pain gets worse by itself				
Yes	173 (27.0)	40 (23.1)	133 (76.9)	0.18
No	468 (73.0)	85 (18.2)	383 (81.8)	
Missing	11	2	9	
Biting makes pain worse				
Yes	312 (48.7)	78 (25.0)	234 (75.0)	0.0007
No	329 (51.3)	47 (14.3)	282 (85.7)	
Missing	11	2	9	
Cold or hot foods make pain worse				
Yes	280 (43.7)	67 (23.9)	213 (76.1)	
No	361 (56.3)	58 (16.1)	303 (83.9)	
Missing	11	2	9	0.0157
Pain Sensitivity				
Pain for >8 h/d for >15 d/mo for >3 mo				
Yes	123 (19.1)	29 (23.6)	94 (76.4)	0.26
No	521 (80.9)	98 (18.8)	423 (81.2)	
Missing	8	0	8	
Took pain medication in past week				
Yes	379 (59.6)	96 (25.3)	283 (74.7)	<0.0001
No	257 (40.4)	31 (12.1)	226 (87.9)	
Missing	16	0	16	
Pain duration during the past week				
No pain	165 (25.6)	16 (9.7)	149 (90.3)	0.0009
1 d of pain	30 (4.7)	4 (13.3)	26 (86.7)	
2 d of pain	43 (6.7)	7 (16.3)	36 (83.7)	

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Appendix Table.
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Characteristic	Worst Intensity of Tooth Pain in Past Week			P Value ^a
	Overall	≥7 (Severe)	<7	
3 d of pain	58 (9.0)	11 (19.0)	47 (81.0)	
4 d of pain	76 (11.8)	25 (32.9)	51 (67.1)	
5 d of pain	58 (9.0)	14 (24.1)	44 (75.9)	
6 d of pain	26 (4.0)	4 (15.4)	22 (84.6)	
7 d of pain	188 (29.2)	46 (24.5)	142 (75.5)	
Missing	8	0	8	
Pain duration during the past week				
Mean (SD)	3.7 (2.8)	4.5 (2.4)	3.5 (2.8)	0.0002
Median	4.0	5.0	4.0	0.0003
Missing	8	0	8	
Pain in more than 1 area of body at least 4 d each week				
Yes	188 (29.2)	47 (25.0)	141 (75.0)	0.0383
No	455 (70.8)	80 (17.6)	375 (82.4)	
Missing	9	0	9	
Pain Interference				
Number of missed days				
No days away from activities	515 (80.3)	78 (15.1)	437 (84.9)	<0.0001
1 d away from activities	38 (5.9)	11 (28.9)	27 (71.1)	
2 d away from activities	38 (5.9)	18 (47.4)	20 (52.6)	
3 d away from activities	22 (3.4)	6 (27.3)	16 (72.7)	
4 d away from activities	12 (1.9)	4 (33.3)	8 (66.7)	
5 d away from activities	8 (1.2)	4 (50.0)	4 (50.0)	
6 d away from activities	3 (0.5)	1 (33.3)	2 (66.7)	
7 d away from activities	5 (0.8)	4 (80.0)	1 (20.0)	
Missing	11	1	10	
Number of days when patient missed usual activities due to pain				
Mean (SD)	0.5 (1.2)	1.1 (1.8)	0.4 (1.0)	<0.0001
Median	0.0	0.0	0.0	<0.0001
Missing	11	1	10	
Tooth pain interference with usual activities				
Mean (SD)	1.8 (2.6)	3.0 (3.0)	1.5 (2.4)	<0.0001
Median	0.0	2.0	0.0	<0.0001
Missing	9	1	8	
Tooth pain interference with recreational activities				
Mean (SD)	1.5 (2.6)	2.9 (3.2)	1.2 (2.3)	<0.0001
Median	0.0	1.0	0.0	<0.0001
Missing	9	0	9	

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Appendix Table.
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Characteristic	Overall	Worst Intensity of Tooth Pain in Past Week		P Value ^a
		≥7 (Severe)	<7	
Tooth pain interference with work				
Mean (SD)	1.4 (2.5)	2.5 (2.9)	1.2 (2.2)	<0.0001
Median	0.0	1.0	0.0	<0.0001
Missing	10	1	9	
Combined interference scale^b (highest score)				
Mean (SD)	1.9 (2.8)	3.4 (3.3)	1.6 (2.5)	<0.0001
Median	0.0	3.0	0.0	<0.0001
Missing	5	0	5	
Combined interference scale^b (mean score)				
Mean (SD)	1.6 (2.5)	2.8 (2.9)	1.3 (2.2)	<0.0001
Median	0.0	1.7	0.0	<0.0001
Missing	14	2	12	
Psychosocial Characteristics				
Pain made worse with stress				
Yes	43 (6.7)	18 (41.9)	25 (58.1)	0.0005
No	598 (93.3)	107 (17.9)	491 (82.1)	
Missing	11	2	9	
Fear about appointment				
Not at all	235 (36.3)	44 (18.7)	191 (81.3)	0.49
A little	293 (45.2)	61 (20.8)	232 (79.2)	
Quite a lot	62 (9.6)	8 (12.9)	54 (87.1)	
Very much	58 (9.0)	13 (22.4)	45 (77.6)	
Missing	4	1	3	
Fear (binary)				
Quite a lot or very much	120 (18.5)	21 (17.5)	99 (82.5)	0.61
A little or not at all	528 (81.5)	105 (19.9)	423 (80.1)	
Missing	4	1	3	
Expected treatment outcome				
Very good	426 (65.6)	84 (19.7)	342 (80.3)	0.90
Good	207 (31.9)	41 (19.8)	166 (80.2)	
Fair	16 (2.5)	2 (12.5)	14 (87.5)	
Poor	0	0	0	
Missing	3	0	3	
Expected treatment outcome				
Very good	426 (65.6)	84 (19.7)	342 (80.3)	0.92
Good or fair	223 (34.4)	43 (19.3)	180 (80.7)	
Missing	3	0	3	

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Appendix Table.
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Characteristic	Overall	Worst Intensity of Tooth Pain in Past Week		P Value ^a
		≥7 (Severe)	<7	
Systemic Health Characteristics				
Smoked ≥100 cigarettes in lifetime				
Yes	305 (47.4)	59 (19.3)	246 (80.7)	0.84
No	339 (52.6)	68 (20.1)	271 (79.9)	
Missing	8	0	8	
Currently smoke cigarettes				
Yes	100 (15.5)	20 (20.0)	80 (80.0)	1.00
No	544 (84.5)	107 (19.7)	437 (80.3)	
Missing	8	0	8	
On average, how many cigarettes smoked per day?				
Mean (SD)	5.7 (8.9)	5.9 (9.6)	5.7 (8.7)	0.87
Median	0.0	0.0	0.0	0.93
Missing	8	0	8	
Doctor ever told you that you have diabetes or high blood sugar				
Yes	82 (12.9)	18 (22.0)	64 (78.0)	0.66
No	553 (87.1)	109 (19.7)	444 (80.3)	
Missing	17	0	17	
Pulpal Diagnoses				
Necrotic pulp				
Yes	346 (53.6)	60 (17.3)	286 (82.7)	0.16
No	300 (46.4)	66 (22.0)	234 (78.0)	
Missing	6	1	5	
Normal or asymptomatic pulpitis				
Yes	64 (9.9)	14 (21.9)	50 (78.1)	0.62
No	582 (90.1)	112 (19.2)	470 (80.8)	
Missing	6	1	5	
Symptomatic irreversible pulpitis				
Yes	236 (36.5)	52 (22.0)	184 (78.0)	0.22
No	410 (63.5)	74 (18.0)	336 (82.0)	
Missing	6	1	5	
Apical Diagnoses				
Normal apical tissue				
Yes	151 (24.5)	20 (13.2)	131 (86.8)	0.0545
No	466 (75.5)	95 (20.4)	371 (79.6)	
Missing	35	12	23	
Symptomatic apical periodontitis				
Yes	335 (54.3)	82 (24.5)	253 (75.5)	<0.0001

(continued)

Appendix Table.

(continued)

Characteristic	Overall	Worst Intensity of Tooth Pain in Past Week		P Value ^a
		≥7 (Severe)	<7	
No	282 (45.7)	33 (11.7)	249 (88.3)	
Missing	35	12	23	
Asymptomatic apical periodontitis				
Yes	36 (5.8)	4 (11.1)	32 (88.9)	
No	581 (94.2)	111 (19.1)	470 (80.9)	
Missing	35	12	23	0.28
Acute apical abscess				
Yes	42 (6.8)	6 (14.3)	36 (85.7)	0.54
No	575 (93.2)	109 (19.0)	466 (81.0)	
Missing	35	12	23	
Chronic apical abscess				
Yes	53 (8.6)	3 (5.7)	50 (94.3)	0.0090
No	564 (91.4)	112 (19.9)	452 (80.1)	
Missing	35	12	23	
Tooth Characteristics				
Apical radiolucency exhibited				
Yes	275 (42.6)	46 (16.7)	229 (83.3)	0.16
No	370 (57.4)	79 (21.4)	291 (78.6)	
Missing	7	2	5	
Tooth tender to percussion				
Yes	425 (65.3)	98 (23.1)	327 (76.9)	0.0018
No	226 (34.7)	29 (12.8)	197 (87.2)	
Missing	1	0	1	
Tooth tender to biting pressure				
Yes	395 (60.8)	94 (23.8)	301 (76.2)	0.0006
No	255 (39.2)	33 (12.9)	222 (87.1)	
Missing	2	0	2	
Tooth responds to cold testing				
Yes	296 (45.7)	73 (24.7)	223 (75.3)	0.0039
No	351 (54.3)	54 (15.4)	297 (84.6)	
Missing	5	0	5	
Prolonged response to cold				
Yes	230 (35.6)	57 (24.8)	173 (75.2)	0.0174
No	416 (64.4)	70 (16.8)	346 (83.2)	
Missing	6	0	6	
Deepest probing depth for tooth				
Mean (SD)	3.5 (1.4)	3.4 (1.2)	3.5 (1.5)	0.36
Median	3.0	3.0	3.0	0.51

(continued)

Appendix Table.

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Characteristic	Overall	Worst Intensity of Tooth Pain in Past Week		P Value ^a
		≥7 (Severe)	<7	
Missing	1	0	1	
Draining sinus tract associated with tooth				
Yes	54 (8.5)	3 (5.6)	51 (94.4)	0.0039
No	583 (91.5)	124 (21.3)	459 (78.7)	
Missing	15	0	15	
Bleeding within pulp chamber				
Yes	331 (50.8)	69 (20.8)	262 (79.2)	0.38
No	321 (49.2)	58 (18.1)	263 (81.9)	
Swelling associated with tooth				
Yes	64 (10.0)	8 (12.5)	56 (87.5)	0.14
No	575 (90.0)	119 (20.7)	456 (79.3)	
Missing	13	0	13	
Maxillary tooth				
Yes	389 (59.7)	67 (17.2)	322 (82.8)	0.0867
No	263 (40.3)	60 (22.8)	203 (77.2)	
Posterior tooth				
Yes	582 (89.3)	114 (19.6)	468 (80.4)	1.0
No	70 (10.7)	13 (18.6)	57 (81.4)	

^aThe *P* values for associations of continuous-scaled measures with severe worst postoperative pain were obtained from the Student's *t* test (first *P* value) and the nonparametric Wilcoxon rank sum test (second *P* value). The *P* values for associations with categorical-scaled measures were obtained from the Fisher's exact test; the Fisher–Freeman–Halton test, an extension to the Fisher's exact test, was used when there were more than 2 levels for the characteristic. Boldface indicates statistical significance ($P < 0.05$).

^bThe variable included pain interference with usual activities, interference with recreational activities, and interference with work.