

Evaluation of Root Canal Treatment Anxiety Among Jordanian Patients

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Abstract

Dental anxiety is a prevalent concern among individuals undergoing root canal therapy. This study aims to assess the levels of dental anxiety among Jordanian patients undergoing root canal treatment.

A total of eighty-two adult patients who underwent nonsurgical root canal therapy at the School of Dentistry, University of Jordan, participated in this study. Pre- and post-treatment questionnaires were administered to assess anxiety levels, age, and gender. Post-treatment questions solicited participants' ratings of anxiety levels and perceptions of certain aspects of the endodontic treatment experience.

Analysis revealed that 43.9% of participants reported a reduction in anxiety levels following root canal therapy. Furthermore, a significant majority (96.3%) expressed willingness to undergo root canal treatment again to preserve their teeth.

Technological advancements in materials, instruments, microscopes, and other innovations have contributed to decreased patient anxiety levels during root canal procedures.

Clinical article (J Int Dent Med Res 2024; 17(1): 298-303)

Keywords: Anxiety, Root canal, Endodontics.

Received date: 13 January 2024

Accept date: 11 March 2024

Introduction

"I would rather have a baby than a root canal," "This isn't going to hurt, is it?", and "No offense, doctor, but I don't like dentists" are among the unsolicited comments of patients that endodontists frequently encounter before the start of therapy. Other patients will express their apprehension by crying, hyperventilating, or becoming faint at the time of local anesthetic injection. Still others communicate apprehension by clenching their fists or becoming extremely loquacious.

In the fall of 1984, a public opinion telephone survey of 1,000 people was commissioned by the American Association of Endodontists to measure awareness and attitudes about root canal therapy¹. Although only about one-fourth of the respondents had experienced a root canal procedure, three-fourths had an opinion concerning discomfort or pain associated with the procedure: 52% perceived root canal therapy as painful, 24%

associated little or no pain with the procedure, and 24% did not know. Individuals who had actually experienced root canal therapy were four or five times more likely to describe it as painless than those who had never had the procedure. Conversely, respondents who had never had root canal therapy described the procedure as "extremely painful" twice as often as those that actually had the treatment.

Apart from the survey mentioned above¹ very little research has been conducted regarding anxiety in the context of nonsurgical root canal therapy. This dearth of investigation prompted the development of the Endodontic Fear Survey, aimed at assessing the influence of specific conditions and procedures inherent to the endodontic process on the prevailing public apprehension surrounding root canal therapy.

Materials and methods

The Endodontic Fear Survey² comprised 22 inquiries (Tables 1 and 2). Prior to commencing therapy, participants were requested to respond to 3 questions, with an additional 19 questions administered upon the conclusion of treatment. All survey participants were adult patients undergoing nonsurgical root canal therapy conducted by a faculty member.

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TABLE 1. Pretreatment questions

1. All things considered, are you fearful of having root canal work?			
///	///	///	///
not at all	a little	much	very much
2. Date of birth:			
	Month	Day	Year
3. Sex: / / Female / / Male.			

The first question asked patients to rate their fear of root canal therapy. They were instructed to select one of four responses, each corresponding to a numerical value: "not at all" = 1, "a little" = 2, "much" = 3, and "very much" = 4. Respondents indicating "not at all" or "a little" were categorized as experiencing low anxiety, while those selecting "much" or "very much" were classified as experiencing high anxiety. Subsequent inquiries pertained to the subjects' date of birth and gender (questions 2 and 3, respectively). The responses to questions 4 through 21 were subsequently analyzed based on the aforementioned classification.

Subject categories included low anxiety, high anxiety, individuals under 40 years of age, those over 40 years of age, as well as both male and female participants. Questions 4 to 13 delineate scenarios or procedures commonly associated with discomfort during endodontic therapy. Participants were tasked with evaluating their level of discomfort or anxiety regarding each scenario or procedure on a numerical scale. The scale ranged from 1 (indicating no discomfort) to 5 (indicating significant discomfort), with an additional option of 0 (representing lack of experience with the condition or procedure). Each question was then ranked based on the mean score, with lower ranks indicating lesser discomfort or anxiety and higher ranks suggesting greater discomfort or anxiety. Rankings were computed across different subject categories, including males, females, high anxiety individuals, low anxiety individuals, and the entire sample population.

Questions 14 and 1 were duplicated to ascertain any notable alteration in the fear levels associated with root canal treatment. The difference between the responses to question 1 (administered prior to the initiation of root canal treatment) and question 14 (administered post-treatment) provided a quantitative measure of the shift in a participant's reported fear. A negative

value indicated a reduction in fear, zero suggested no change, and a positive value signified an increase in fear following the treatment.

Question 15 examined the impact of family, friends, and mass media on patient anxiety, while question 16 assessed subjects' perceptions of the level of pain associated with the therapy. Both questions utilized a 5-point response scale, spanning from "not at all" to "very much."

Questions 17 through 21 required "yes," "no," or "don't know" responses. These items focused on previous experiences of root canal therapy, including instances of emergency treatment (question 17), appointment cancellations due to fear (question 18), root canal procedures on anterior teeth (question 19), posterior teeth (question 20), and whether treatment was administered by an endodontist (question 21). Response frequencies and percentages for these inquiries were documented for both high and low-anxiety cohorts. Question 22 directly asked: "Would you undergo root canal therapy again to preserve a tooth?" Statistical analysis involved chi-square tests aimed at identifying significant differences between self-reported anxiety levels (ranging from "not at all" to "very much") and demographic variables such as age, gender, and the dichotomy of high versus low anxiety established by questions 1 to 3. However, due to the homogeneity of the sample population (comprising 64 low-anxiety subjects versus only 18 high-anxiety subjects), chi-square analysis failed to yield a valid test outcome.

Results

The Endodontic Fear Survey was completed by a cohort of 82 patients, among whom 18 met the criteria for high anxiety, while 64 fell into the low-anxiety category. Regarding age distribution, 38 participants were younger than 40 years old, while 44 were aged 40 years and above. Gender distribution in the study comprised 46 females and 36 males. Notably, nearly 94% of the subjects reported experiencing either no change or a decrease in fear levels following nonsurgical root canal therapy, as detailed in Table 3.

In Table 4, mean responses to questions 4 through 13 were assessed based on gender, anxiety level (high vs. low), and across the entire

sample population. Furthermore, Table 5 provides a quantitative comparison between high- and low-anxiety subjects regarding their responses to external influences (question 15) and their perceptions of the discomfort associated with root canal therapy (question 16).

TABLE 3. Summary of values for question 14 minus question 1

	Less Fearful (Negative Values)	No Change (Zero Values)	More Fearful (Positive Values)	Totals
Frequency	36	41	5	82
%	43.9	50	6.1	100

TABLE 5. Mean scores of high- and low-anxiety subjects to questions 15 and 16*

Question	High Anxiety	Low Anxiety
15. Do stories concerning root canal therapy (RCT) make you feel apprehensive?	2.294	1.625
16. Is RCT painful?	2.500	1.578

* Mean scores were based on the numerical values assigned to the responses to each question, ranging from not at all (1) to very much (5). Higher mean scores were more anxiety producing.

TABLE 6. Frequency and percentage of responses by high-anxiety subjects

Question	Yes	No	Don't Know	Totals
17. Emergency care associated with previous RCT	5* (27.8)†	11 (61.1)	2 (11.1)	18 (100)
18. Missed or cancelled appointments because of fear	1 (5.6)	17 (94.4)	0 (0)	18 (100)
19. Previous anterior RCT	4 (22.2)	14 (77.8)	0 (0)	18 (100)
20. Previous posterior RCT	9 (50)	9 (50)	0 (0)	18 (100)
21. Previous RCT by an endodontist	5 (27.8)	13 (72.2)	0 (0)	18 (100)

* Values not in parentheses are frequencies.
 † Values in parentheses are percentages.

Tables 6 and 7 offer insights into the frequencies and percentages of high- and low-anxiety subjects' responses ("yes," "no," or "don't know") to questions 17 through 21. Lastly, Table 8 indicates that 79 respondents (96.3%) expressed willingness to undergo future root canal therapy as a means of preserving a tooth.

TABLE 7. Frequency and percentage of responses by low-anxiety subjects

Question	Yes	No	Don't Know	Totals
17. Emergency care associated with previous RCT	12* (18.8)†	48 (75)	4 (6.2)	64 (100)
18. Missed or cancelled appointments because of fear	0 (0)	64 (100)	0 (0)	64 (100)
19. Previous anterior RCT	14 (21.9)	50 (78.1)	0 (0)	64 (100)
20. Previous posterior RCT	23 (35.9)	41 (64.1)	0 (0)	64 (100)
21. Previous RCT by an endodontist	12 (18.8)	49 (76.6)	3 (4.6)	64 (100)

* Values not in parentheses are frequencies.
 † Values in parentheses are percentages.

TABLE 8. Frequency and percentage of responses to question 22: "Would you have RCT again to save one of your teeth?"

	Yes	No	Don't Know	Totals
Frequency	79	0	3	82
%	96.3	0	3.7	100

Discussion

Eighteen of 82 participants (22%) in this study qualified for the high-anxiety category. Fourteen of the 18 (77.78%) were female. This result agrees with most dental fear research which shows that females report higher levels of fear and anxiety than do males²⁻¹⁰. Six of 44 subjects over the age of 40 (13.64%) fell into the high-anxiety category. Other studies also report less dental anxiety among older subjects.^{1, 11}

Even though root canal therapy can usually be performed with a minimum of discomfort, many patients express apprehension concerning therapy before the start of treatment. This apprehension is often based on stories of traumatic episodes related by family members, friends, or mass media rather than by actual experience. The data in Table 3 suggest that pretherapy anxiety was often dispelled since 43.9% of subjects reported a decrease in anxiety after treatment while only 6.1% reported an increase.

In general, Table 4 indicated that local anesthetic injection, sensation of files introduced into or worked in root canals, and tapping or pushing on a sore tooth were ranked among the most unpleasant aspects of root canal therapy. Use of the electric pulp tester, use of the rubber

dam, and length of appointments were ranked among the least unpleasant or anxiety-arousing aspects. Of intermediate concern were making multiple radiographs, rubber dam clamp placement, radiograph film placement and making the access preparation (drilling). Notable exceptions were males who ranked multiple radiographs second and high-anxiety subjects who ranked access preparation first along with local anesthetic injection and tapping or pushing on a sore tooth. In most dental fear research, the anesthetic needle and the drill rank among the most unpleasant or anxiety-arousing stimuli^{7, 12-17}. While this study showed that local anesthetic injection caused a high level of anxiety, making the access preparation or drilling caused only moderate apprehension for most subjects (Table 4).

Table 5 shows high-anxiety subjects gave a greater mean response than low-anxiety subjects to question 15: "Does hearing or reading stories about root canal treatment make you feel apprehensive?" This finding supports some previous studies in which highly anxious dental patients reported that stories by friends, relatives, and mass media concerning dental work contributed significantly to their apprehension^{18, 19}. Seventy-nine subjects or 96.3% indicated that they would have future root canal therapy if needed to save a tooth (Table 8). This statistic supports the results of a public opinion poll commissioned by the American Association of Endodontists in 1984⁽¹⁾ in which 91% of the respondents indicated they would either do whatever their dentist recommended (41%) or ask their dentist to perform the treatment (22%), or seek the services of an endodontist (28%) if they learned they needed root canal therapy. Furthermore the invention of new equipment such as the loops and the microscope, with new materials such as MTA made the Root Canal Treatment fairly easy Task.

Conclusions

Data from the Endodontic Fear Survey supports the following conclusions regarding fear of conventional root canal therapy:

Gender disparities were evident, with females exhibiting higher levels of anxiety towards root canal therapy compared to males.

1. Age played a notable role, as older individuals demonstrated lower levels of anxiety

regarding root canal therapy in contrast to their younger counterparts.

2. Following therapy, a notable 43.9% of participants reported a decrease in fear associated with root canal procedures.
3. The most discomforting or anxiety-inducing aspects of root canal therapy included local anesthetic injection, the sensation of files being introduced or manipulated within root canals and tapping or pushing on a sore tooth.
4. Subjects with heightened anxiety levels expressed greater apprehension upon encountering stories or information related to root canal treatment compared to those with lower anxiety levels.
5. Individuals with elevated anxiety levels perceived root canal treatment as more painful compared to those with lower anxiety levels.
6. A larger proportion of subjects with high anxiety levels reported emergency visits associated with previous root canal therapy compared to those with lower anxiety levels.
7. There were no significant differences between high- and low-anxiety subjects regarding reporting previous missed or cancelled appointments for root canal therapy due to apprehension or fear.
8. Approximately equal percentages of high- and low-anxiety subjects reported previous root canal therapy in anterior teeth, whereas a higher number of high-anxiety subjects reported undergoing root canal therapy in posterior teeth.
9. A greater percentage of high-anxiety subjects disclosed having an endodontist manage some or all their previous root canals.
10. Nearly all participants (96.3%) expressed willingness to undergo future root canal therapy to preserve a tooth.

Declaration of Interest

The authors report no conflict of interest.

TABLE 2. Posttreatment questions

Did you mind:					
4. the dentist tapping or pushing on a sore tooth?					
not at all	a little	somewhat	much	very much	never experienced
5. the use of the electric pulp tester?					
not at all	a little	somewhat	much	very much	never experienced
6. having multiple X-rays taken of your tooth?					
not at all	a little	somewhat	much	very much	
7. when an X-ray film was placed in your mouth?					
not at all	a little	somewhat	much	very much	
8. when a metal rubber dam clamp was placed on your tooth?					
not at all	a little	somewhat	much	very much	
9. the use of the rubber dam?					
not at all	a little	somewhat	much	very much	
10. getting an injection for anesthesia?					
not at all	a little	somewhat	much	very much	never experienced
11. the drilling on your tooth?					
not at all	a little	somewhat	much	very much	
12. the sensation of the root canal files?					
not at all	a little	somewhat	much	very much	
13. the length of appointments required to do root canal therapy?					
not at all	a little	somewhat	much	very much	
14. All things considered, are you fearful of having root canal work?					
not at all	a little	much	very much		
15. Does hearing or reading stories about root canal treatment make you feel apprehensive?					
not at all	a little	somewhat	much	very much	
16. Is root canal treatment painful?					
not at all	a little	somewhat	much	very much	
17. Have you ever had pain and/or swelling which required an emergency visit to the dentist after a root canal appointment?					
Yes	No	Don't know			
18. Have you ever cancelled or missed an appointment for root canal therapy because you were apprehensive or fearful?					
Yes	No	Don't know			
19. Have you had previous root canal treatment on any front teeth?					
Yes	No	Don't know			
20. Have you had previous root canal treatment on any 'back teeth'?					
Yes	No	Don't know			
21. Did an endodontist do any of your previous root canal work?					
Yes	No	Don't know			
22. Would you have root canal therapy again to save one of your teeth?					
Yes	No	Don't know			

TABLE 4. Rankings of questions 4 through 13*

Question	Male	Female	High Anxiety	Low Anxiety	Total Sample
4. Tapping or pushing on a sore tooth	6†	6	7	8	8
5. Electric pulp tester	1	1	1	1	1
6. Multiple radiographs	8	3	2	6	4
7. X-ray film placement	7	5	4	6	6
8. Rubber dam clamp placement	5	5	5	3	5
9. Rubber dam	3	2	3	2	2
10. Injection for local anesthesia	9	7	7	8	10
11. Access preparation (drilling)	4	6	7	5	7
12. Sensation of files in root canals	6	8	6	7	9
13. Length of appointments	2	4	1	4	3

* Rankings are from least anxiety producing (1) to most anxiety producing (10).

† Numbers are ranks based on the mean scores by a particular group to a certain question. Questions with the same rank had identical mean scores.

References

- Public Communications Inc. Public knowledge and opinion about endodontics: a public opinion survey commissioned by the American Association of Endodontists. Chicago, IL, 1984.
- LeClaire, A. J., Skidmore, A. E., Griffin, J. A., & Balaban, F. S. Endodontic fear survey. *Journal of Endodontics*, 1988; 14(11): 560–564.
- Scott DS, Hirschman R. Psychological aspects of dental anxiety in adults. *J Am Dent Assoc* 1982;104(96):27-31.
- Corah NL., Gale EN, Illig SJ. Assessment of a dental anxiety scale. *J Am Dent Assoc* 1980;101(97):816-20
- Geer JH. The development of a scale to measure fear. *Behav Res Ther* 1965;3 (42):45-53.
- Lamb DH, Plant R. Patient anxiety in the dentist's office. *J Dent Res* 1972;51(60):986-9-13
- Kleinknecht RA, Klepac RK, Alexander LD. Origins and characteristics of fear of dentistry. *J Am Dent Assoc* 1973;86(55):842-846
- Weisenberg M, Kreindler ML, Schachat R, Werboff J. Pain: anxiety and attitudes in black, white and Puerto Rican patients. *Psychosom Med* 1975;37(11):123-35.
- Kleinknecht RA, Bernstein DA. The assessment of dental fear. *Behav Ther* 1978;9(9):626-34.
- Biro PA, Hewson ND. A survey of patient's attitudes to their dentist. *Aust Dent J* 1976;21(4):388-94.
- Husek TR, Alexander S. The effectiveness of the anxiety differential in examination stress situations. *Educ Psychol Meas* 1963;23(3):309-18.
- Molin C, Seeman K. Disproportionate dental anxiety: clinical and noso-logical considerations. *Acta Odontol Scand* 1970;28(9):197-212.
- Gale EN. Fears of the dental situation. *J Dent Res* 1972;51(6):964-6.
- Messer JG. Stress in dental patients undergoing routine procedures. *J Dent Res* 1977;56(4):362-7.
- Bernstein DA, Kleinknecht RA, Alexander LD. Antecedents of dental fear. *J Pub Health Dent* 1979;39(7):113-24.
- Corah NL, Bissell GD, Illig SJ. Effect of perceived control on stress reduction in adult dental patients. *J Dent Res* 1978;57(8):74-6.
- Hirschman R, Revland P, Hawk G, Young D. Effects of dental anxiety and phase of treatment on discomfort during dental simulation. *J Dent Res* 1980;59(9):1064.
- Scott DS, Hirschman R, Schroder K. Historical antecedents of dental anxiety. *J Am Dent Assoc* 1984;108(5):42-5.
- Shoben EJ, Borland L. An empirical study of the etiology of dental fears. *J Clin Psychol* 1954;10(6):171-4.
- Forgione AG, Clark RE. Comments of an empirical study of the causes of dental fears. *J Dent Res* 1974;53(9):496.

- Jamal A. Abeer A. Abozaglan R. magnification. in *Endodontics. A literature review . J Inter Dent and med Res*. 2005;53(4): 63-65.