

Anxiety Related to Nonsurgical Root Canal Treatment: Systematic Review

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Abstract

Introduction: Anxiety is an emotion characterized by feelings of tension, worried thoughts, and physical changes. Dental anxiety has been associated with pain, fear, care avoidance, and more invasive treatments including nonsurgical root canal treatment (NSRCT). The very words *root canal* are deeply embedded in societal consciousness. Better understanding of dental anxiety may prevent treatment avoidance. The purpose of this study was to conduct a systematic review of NSRCT-associated anxiety. **Methods:** Inclusion/exclusion criteria defined MEDLINE, Cochrane Library, psychINFO, manual, and citation searches. Title lists and abstracts were read to determine utility; data were extracted, summarized, and compiled into an evidence table, and meta-analyses were performed. **Results:** Defined searching produced 835 titles; 36 articles were included, mostly representing modern populations from countries with very high human development indices. Major sources of heterogeneity included differing study aims, outcome measures, clinical settings, locations, operators, sample selection, and sample size. Meta-analysis of 18 articles including 1989 subjects gave a pretreatment anxiety rating of 39 (standard deviation, 9) on a normalized 100-point scale. Meta-analysis of 4 articles including 232 subjects gave a post-treatment anxiety rating of 27 (standard deviation, 5) on a normalized 100-point scale, representing a 30% reduction. A L'Abbe plot of 5 studies also showed that anxiety decreased after NSRCT. Limited data indicated that gender, age, and prior NSRCT experience influenced NSRCT-associated anxiety. NSRCT-associated anxiety was ranked high among dental treatments, often close to oral surgery. **Conclusions:** NSRCT-associated anxiety was generally moderate. Anxiety decreased after NSRCT. Limited evidence suggested that anxiety is influenced by patient and treatment factors. (*J Endod* 2016; ■:1–11)

Key Words

Anxiety, dental fear, dental phobia, meta-analysis, review, root canal therapy, systematic

Anxiety is an emotion characterized by feelings of tension, worried thoughts, and physical changes such as increased blood pressure (1). Anxiety is a normal reaction to stress and can be beneficial (2, 3). It has been defined as “The apprehensive anticipation of future danger or misfortune accompanied by a feeling of worry, distress, and/or somatic symptoms of tension” (4). Anxiety can help us to prepare and pay attention or alert us to danger. Anxiety differs from fear in that it refers to anticipation of a future concern, whereas fear occurs in response to a specific immediate threat. However, dental anxiety and dental fear are highly correlated (5, 6).

Anxiety is multifactorial and is influenced by a patient's life experiences; information acquired directly or indirectly, true or false; their intrinsic vulnerability; and by their dentist (7–14). Anxiety pathways include the cognitive, parental, informative, verbal, and vicarious (15). External factors and contextual experiences over many years can contribute to anxiety (8, 9, 12, 16, 17). In addition, the entire lived environment, including social interactions, and media can influence feelings of anxiety (14). For example, anxiety can be learned from parents, peers, colleagues, and friends. Negative or unpleasant experiences can increase anxiety (16). The most common pathways associated with endodontic anxiety are cognitive conditioning and parental, but different pathways appear to be adopted by different ethnic groups (15, 18).

Anxiety can lead to recurring intrusive thoughts and concerns or cause avoidance of certain situations out of worry. This can lead to impacts on job performance, school-work, personal relationships, and health behaviors. Anxiety affects many dental patients (19). Dental anxiety has long been recognized, studied, and measured (20, 21). It has been correlated with increased probability of dental treatment avoidance (22, 23). It also makes the treatment process more difficult, disrupts scheduling, and causes discomfort to caregivers (24). Dental experience can decrease anxiety. Conversely, continued avoidance can increase anxiety, creating a vicious cycle (25–27). Dental anxiety may have pervasive consequences; individuals manifesting severe dental anxiety may be more vulnerable to some psychological disorders (8, 28, 29).

Significance

The importance of patient-based, psychosocial, and psychological factors is growing rapidly in various healthcare arenas. Better understanding of dental anxiety may prevent avoidance of root canal treatment, suffering, and morbidity and will assist dentists in managing anxious patients.

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Review Article

Alternatively, a highly anxious person may simply manifest more dental anxiety (11). In any case, a reduction in dental anxiety can improve both oral health and quality of life (23, 30, 31).

Dental anxiety has been associated with pain and is more common with intrusive treatments such as extractions, fillings, and nonsurgical root canal treatment (NSRCT) (32–36). In addition, a higher level of anxiety may increase pain intensity; the context of the treatment is very important (37).

The very words *root canal* appear to be deeply embedded in societal consciousness; they are a commonly used and most unfortunate idiom for something menacing or to be dreaded. Terms such as *root canal economics* and *root canal politics* have entered popular usage in ways that demonstrate the negative connotations associated with NSRCT. A recent State of the Union address equated the Great Recession with root canal treatment as something to be disliked. Scientific articles have reported patients as saying “I would rather have a baby than a root canal” (38, 39). Anticipation of a negative experience can increase anxiety (3). Improved understanding of NSRCT-associated anxiety could improve patient management, decrease anxiety, increase treatment acceptance, decrease treatment avoidance, and increase treatment completion.

Anxiety is associated with dental treatment, specifically with NSRCT; this has profound implications for patients and dentists. Hence, the purpose of this study was to conduct a systematic review of NSRCT-associated anxiety.

Materials and Methods

A systematic review was developed following established procedures including PRISMA guidelines (40). Methodology included formulating review questions, constructing a search strategy, defining inclusion and exclusion criteria, locating studies, selecting studies, assessing study quality, extracting data, and interpretation.

During the design phase after pilot search strategies were being developed and tested by using sentinel articles, an iterative process was used to identify the following review questions:

1. What is the pretreatment anxiety level for patients who are due to receive NSRCT?
2. Does level of NSRCT-associated anxiety change after treatment?
3. Is NSRCT-associated anxiety influenced by patient and treatment factors?

Search Methodology

Electronic searches were performed in MEDLINE, Cochrane Library, and psychINFO databases. The search strategies are described in Figure 1A and B. A separate search of psychINFO was included because it has only a moderate overlap with MEDLINE, and it uses a different thesaurus for indexing (Fig. 1B). The results from the designed search strategies were supplemented by manual searches and citation mining. Two investigators screened the titles and abstracts of all articles

A	<pre>(("Root Canal Therapy/psychology"[MeSH] OR "Manifest Anxiety Scale"[Mesh] OR "anxiety scale"[text word] OR "DAS"[text word] OR CDAS[text word] OR "Anxiety"[Mesh] OR "Fear"[Mesh] OR anxiet*[text word] OR fear*[text word])) AND (("Root Canal Therapy"[Mesh] OR "Root Canal Preparation"[Mesh] OR "Endodontics"[Mesh] OR "Dental Pulp Diseases"[Mesh] OR "Periapical Diseases"[Mesh] OR "root canal*" [text word] OR endodont*[text word] OR "dental pulp"[text word] OR "pulp stone*" [text word] OR "pulpal dysplasia"[text word] OR "coronal dentin"[text word] OR "pulp necrosis"[text word] OR "pulp necroses"[text word] OR "pulp gangrene*" [text word] OR "pulp mummification*" [text word] OR "pulp autolyses"[text word] OR "pulp autolysis"[text word] OR "secondary dentin*" [text word] OR "periapical disease*" [text word] OR "periapical periodontitides"[text word] OR "periapical periodontitis"[text word] OR "Dentoalveolar Abscess*" [text word] OR "Alveolar Abscess"[text word] OR "periapical abscess*" [text word] OR "dental granuloma*" [text word] OR "periapical granuloma*" [text word] OR "radicular cyst*" [text word] OR "periapical cyst"[text word] OR "Dental Pulp Disease*" [text word] OR "pulp calcification"[text word] OR "denticle*" [text word] OR "pulp exposure*" [text word] OR "pulpitis"[text word] OR "pulpless tooth"[text word] OR "pulpless teeth"[text word])) AND English[lang]</pre>
B	<pre>((("root canal*" OR endodontic* OR "dental pulp" OR "pulp stone*" OR "pulpal dysplasia" OR "coronal dentin" OR "pulp necrosis" OR "pulp necroses" OR "pulp gangrene*" OR "pulp mummification*" OR "pulp autolyses" OR "pulp autolysis" OR "secondary dentin*" OR "periapical disease*" OR "periapical periodontitides" OR "periapical periodontitis" OR "Dentoalveolar Abscess*" OR "Alveolar Abscess" OR "periapical abscess*" OR "dental granuloma*" OR "periapical granuloma*" OR "radicular cyst*" OR "periapical cyst" OR "Dental Pulp Disease*" OR "pulp calcification" OR "denticle*" OR "pulp exposure*" OR "pulpitis" OR "pulpless tooth" OR "pulpless teeth") OR (SU.EXACT("Dental Surgery") OR SU.EXACT("Dental Treatment"))) AND ((SU.EXACT("Taylor Manifest Anxiety Scale") OR SU.EXACT.EXPLODE("Anxiety") OR SU.EXACT.EXPLODE("Fear")) OR "anxiety scale" OR DAS OR CDAS OR anxiet* OR fear*)</pre>

Figure 1. Search strategies for root canal treatment–associated anxiety. Box I lists the PubMed search strategy; this was replicated in the Cochrane Library. Box II lists the PsycINFO search strategy; the limiting term was “English.”

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