

Systematic Review  
 Oral Surgery

# Factors determining tooth extraction anxiety and fear in adult dental patients: a systematic review

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**Abstract.** The aim of this study was to review previous studies and to identify reliable factors determining anxiety in adult patients undergoing tooth extraction procedures. An electronic literature search was conducted of the MEDLINE, ScienceDirect, SpringerLink, and Wiley Online Library databases covering the period January 2005 to May 2015. Sequential screening was performed at the title/abstract and full-text level. The review included all human prospective and retrospective follow-up studies and clinical trials, cohort studies, case-control studies, and case series that demonstrated at least one factor determining tooth extraction anxiety and/or fear and used specific scales for measurement. The search identified 16 articles meeting the inclusion criteria. Factors related to tooth extraction in patients were assessed: propensity to anxiety ( $P < 0.05$ ), pain experience or expectations ( $P < 0.05$ ), level of disturbance during the procedure ( $P < 0.001$ ), difficulty of the procedure ( $P = 0.034$ ), marital status ( $P = 0.003$ ), social class ( $P = 0.012$ ), and type of local anaesthesia ( $P = 0.008$ ). Using a video as the method of providing information ( $P < 0.05$ ) and having had a previous negative dental experience ( $P < 0.05$ ) led to an increase in patient anxiety level. Due to disagreements between studies, further investigations into the other factors are required to clarify the results. However, the absence of a single and appropriate scale that includes both the patient's evaluation and that of the doctor, hinders the rating of patient anxiety.

Key words: dental anxiety; tooth extraction; systematic review; factors.

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Fear and anxiety are known psychological responses to uncomfortable or unpleasant stimuli. Armfield and Heaton suggested using 'anxiety' as a term to describe the

emotional state and 'fear' to describe an activated response to unpleasant, fearful stimuli.<sup>1</sup> However, the two terms are usually used synonymously. These terms are

used together in the present review to increase the number of studies included in order to make the results as objective as possible. A third term also related to

negative psychological attitudes is ‘phobia’, which is more a diagnosis set by a psychotherapist than a psychological state or feeling.<sup>1</sup>

These negative psychological conditions are common in patients seen in the field of dentistry. In a long list of fears and phobias, dental fear ranked fourth by prevalence,<sup>2</sup> and research performed in Australia showed that only 52.7% of respondents indicated no or low dental anxiety.<sup>3</sup> Deeper examination has revealed that not all dental procedures cause the same level of anxiety. Dental surgery, and particularly having a tooth extracted, is known to be in the top five most frightening procedures in dental practice.<sup>4</sup> Patients feel more anxious about tooth removal than perceiving a pain or feeling helpless.<sup>4</sup> It is interesting that pain is not the only aspect that makes this procedure unpleasant—people report that the fact of losing a tooth is also an important anxiety-provoking stimulus.<sup>5</sup> Despite the negative effect on the patient’s psychology and feelings, doctors also find it difficult to deal with anxious patients, such that special preparation and mood modification are required.<sup>6</sup>

It is thus clear that anxiety and fear in the dental office should be controlled as much as possible. In order for this to happen, it is important to identify the factors causing dental fear using existing anxiety measurement scales. However, there are many different types of scale using combinations of different criteria. It is still unknown which scales and criteria are most reliable in the evaluation of tooth extraction anxiety. Because of these uncertainties, the present review was conducted to identify reliable factors that have been assessed in previous studies using specific measurement scales that could help a doctor to predict the patient’s anxiety during the tooth extraction procedure.

## Materials and methods

### Protocol and registration

The methods and inclusion and exclusion criteria were determined in advance and documented in the protocol. This review was registered in PROSPERO, an international prospective register of systematic reviews. The protocol can be accessed at [http://www.crd.york.ac.uk/PROSPERO/display\\_record.asp?ID=CRD42015024250](http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42015024250) (registration number CRD42015024250).

This systematic review adhered to the PRISMA statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).<sup>7</sup>

### Focused question

The following focused question was developed according to the population, intervention, comparison, and outcome (PICO) study design: What are the main factors causing anxiety/fear, which can be measured using specific rating scales, in adult patients undergoing a tooth extraction procedure?

### Types of studies

The review included all human prospective and retrospective follow-up studies and clinical trials, cohort studies, case-control studies, and case series published between January 2005 and May 2015 that demonstrated at least one factor determining tooth extraction anxiety and/or fear and used specific scales for measurement. Review studies were excluded.

### Information sources and search strategy

The search strategy was based on an electronic database examination. A search was implemented in the National Library of Medicine database (MEDLINE) through its online site (PubMed), ScienceDirect, SpringerLink, and Wiley Online Library.

The electronic search explored an advanced search in every database separately. The key words used in the primary search stage were “dental fear” OR “dental phobia” OR “dental anxiety” OR “odontology fear” OR “odontology phobia” OR “odontology anxiety” OR “tooth extraction fear” OR “tooth extraction phobia” OR “tooth extraction anxiety” OR “exodontia fear” OR “exodontia phobia” OR “exodontia anxiety”. Key words were selected in order to collect all possible relevant data.

### Selection of studies

All studies were selected by two separate reviewers according to the inclusion and exclusion criteria. The reviewers compared decisions and discussed any arising conflicts, consulting a third party if a consensus could not be reached. The third party was an experienced senior reviewer.

Inclusion criteria were the following: (1) all prospective and retrospective studies, clinical trials, cohort studies, case-control studies, and case series determining at least one factor that may predict tooth extraction anxiety/fear in dental patients and that used a measurement scale for assessment; (2) adult patients (at least 16 years old) who did not have any systemic disorders that may affect mental

health (eating disorders, Down syndrome) and with no disorders that increase tooth extraction risks (diabetes mellitus, HIV, haemophilia); and (3) studies that could not be excluded before careful reading.

Exclusion criteria were the following: (1) studies that examined tooth extraction anxiety/fear as a factor of other occurrences; and (2) studies that included unclear data, with authors who could not be contacted in any way.

The search strategy comprised three stages. In the first stage, a screening of titles took place to exclude all irrelevant publications, case reports, reviews, and animal studies. In the second stage, the abstracts were read to see if the aim of the study met the systematic review question. The third stage was reading the full-text articles to confirm the eligibility of each study according to the inclusion and exclusion criteria.

### Data extraction

The data were independently extracted from articles according to the theme, purposes, and questions of the present review. The following data items were collected from the selected articles: (1) year (year of publication); (2) area (country in which the study was performed); (3) population features (features by which the population was selected, including nationality, age, sex, etc.); (3) factors examined (factors that may cause tooth extraction anxiety/fear examined); (4) evaluation method (type of scale used to describe patient anxiety or the impact of factors); (5) interview features (specific features of the interview, e.g. interview in a non-dental room); (6) interview method (method that was used to collect information from the patients, e.g. self-reported, questionnaires at home, etc.).

### Assessment of methodological quality

The quality of all included studies was evaluated during the full-text reading stage. All methodological elements that may influence the outcomes of the study were marked and evaluated.

The risk of bias in every study was evaluated according to the Cochrane Collaboration (version 5.1.0) two-part tool for assessing risk of bias.<sup>8</sup>

### Synthesis of the results and statistical analysis

Relevant data of interest for the previously stated variables were collected and organized into tables, based on the

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