



Literature review

Anxiety Scales and their levels in Patients with Impacted Third Molars. Literature Review

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Abstract

Introduction: anxiety is common in dental procedures, and particularly in oral surgery, being one of the most frequent difficulties for dental professionals. **Objective:** to expose the different anxiety scales and their levels present in patients undergoing impacted third molars surgical procedures through a literature review between the months of April 2014 and January 2021. **Material and methods:** a literature review of articles was carried out using the *PubMed* and *Google Scholar* databases, the words used in the *PubMed* search that responded to the PICO analysis were "extraction of impacted third molars" "Anxiety Levels" "Anxiety" "impacted third molars", while the search terms in *Google Scholar* were the combination of "patients with anxiety" and "extraction of impacted third molars". The search yielded 114 *PubMed* articles and 367 *Google Scholar* articles,

of which 361 articles from Google Scholar and 97 articles from PubMed were excluded, leaving 23 articles which were fully read. **Results:** there are different scales used to measure dental anxiety of patients who undergo extractions of impacted third molars, which have shown good levels of confidence, validity and strong correlations with dental anxiety. **Conclusions:** the different scales that are used to measure anxiety levels in patients who undergo extractions of impacted third molars are: DAS, MDAS, STAI, SDAI and APAIS, whose levels range from *not anxious* to *very anxious* or *dental phobia*.

Keywords: Anxiety scales, third molar, music therapy, surgical procedure.

INTRODUCTION

Anxiety is considered a negative emotional attitude, which manifests itself through sensations such as tension and fear, accompanied by various bodily signs and symptoms such as palpitations, hyperventilation, nausea, weakness, headaches and sweating¹. There is confusion in the terms “anxiety”, “fear” and “phobia”, using them indistinctly; however, these are originally different concepts². Fear is considered a feeling of distress, caused by the presence of a real or imaginary danger; anxiety refers to a state of restlessness, and phobia is conceptualized as an exaggerated and uncontrollable aversion to certain situations. The three terms, although not synonymous, are closely related and can be applied to similar contexts³.

Anxiety is common in dental procedures and particularly in oral surgery, making it one of the most frequent difficulties for the practitioner⁴. The extraction of impacted third molars does not usually endanger the patient’s life and the recovery is usually short; the physical and psychological effects make oral surgery an unpleasant experience⁵. The third molars erupt between 16 and 23 years of age, even years later, under normal conditions they are positioned behind the second molar and reach the occlusal plane, thus being the last to erupt; when this does not happen and they are not in the mouth, impaction is suspected, while the antagonist and contralateral tooth has erupted⁶.

The presence of impacted third molars is associated with the lack of space, poor position or blockage of the normal eruption path of the tooth due to the presence of a mechanical obstacle; the tooth is retained in the bone surrounded by its pericorony sac⁷. Extraction of the impacted third molar is a common surgical procedure for adults and adolescents; the main causes why the patient may experience anxiety are traumatic experiences of oneself or a family member, lack of information about the surgical process, observing the instruments, especially the carpule syringe used to place local anaesthetic, seeing blood during the procedure (which can cause vasovagal syncope), vibrations or sounds from low-speed motors and unexpected sensations of pain, inducing greater sensitivity to the point of abandoning treatment^{8,9}.

Among the recommendations for the control of anxiety during the surgical treatment of impacted third molars is pharmacological and non-pharmacological intervention; although pharmacological interventions carry inherent risks, such as sedation¹⁰. Non-pharmacological methods like music therapy have a positive effect for the patient when performing the surgical intervention³. One of the most frequent problems reported by oral surgeons in impacted third molar surgery is related to the dental anxiety presented by the patient, which affects preoperative and postoperative clinical care, which can affect treatment planning and general

well-being. Therefore, it is intended to expose the different anxiety scales and their levels present in patients undergoing surgical procedures for impacted third molars through a literature review.

MATERIAL AND METHODS

A literature review of articles was conducted between April 2014 and January 2021, using the *PubMed* and *Google Scholar* databases. The words used in the search in *PubMed* with Boolean operators that responded to the proposed PICO analysis were “extraction of impacted third molars”, “Anxiety Levels”, “Anxiety”, “impacted third molars”, while the search terms in *Google Scholar* were the combination of “patients with anxiety” and “extraction of impacted third molars”.

Within the inclusion criteria were considered all those documents provided by different professional associations that provide information about the levels of anxiety presented by patients before and after an extraction of impacted third molars, clinical studies with treatments for anxiety, literature reviews, and systematic reviews. Exclusion criteria, studies that included other dental specialties, retrospective studies, studies of erupted third molars, university repositories and repeated literature reviews were selected.

RESULTS

A total of 114 articles were obtained from the search for grey literature in the *PubMed* database, and 367 articles in *Google Scholar*. After a review according to the inclusion and exclusion criteria, 361 articles were eliminated from *Google Scholar*, and 97 articles from *PubMed*, leaving twenty-three articles, which were read in their entirety. Below are the most relevant data.

CORAH'S DENTAL ANXIETY SCALE (DAS)

The Dental Anxiety Scale was created by Norman Corah in 1969¹¹. DAS consists of four questions with five possible answers; two of them related to the level of anxiety that the patient experiences in the stomatological clinical environment and the remaining ones are related to dental procedures such as restorations and teeth cleaning^{2, 12}. The questions have five alternative answers, obtaining total score ranges ranging from four to twenty points, which allow the patient to be categorised from *relaxed* to *dental phobia*. The points assigned on an ascending scale range from 1, which means *not anxious* to 5, *extremely anxious*, in a range of values between 4, *no anxiety* and 20, *maximum anxiety*; from twelve points the patient is considered *anxious*, and from fifteen points onwards the patient would be classified as *very anxious*¹³. DAS is conventionally used in a range of 13 to distinguish anxious and non-anxious patients¹².

MODIFIED DENTAL ANXIETY SCALE (MDAS)

The Modified Dental Anxiety Scale was developed by Humphris Morrison and Lindsay in 1995¹⁴. One question was added to the Corah's Dental Anxiety Scale, thus improving its internal consistency¹⁵. The scale is reliable and considers anxiety during the application of local

anaesthesia, which is a factor causing anxiety in patients¹⁶. The MDAS is a questionnaire specifically designed to measure anticipatory fear; it consists of five multiple-choice questions with scores ranging from 5, meaning *no anxiety*, to 25, *maximum anxiety*; a score above thirteen points is considered *high anxiety*¹⁷, while a score greater than nineteen is considered a *phobia*⁹. Currently, MDAS has been more validated in other languages and cultures compared to DAS, so it can be considered the instrument most recently used by the scientific community in the dental environment⁸.

SHORT DENTAL ANXIETY INVENTORY (SDAI)

The Short Dental Anxiety Inventory was developed by Stouthard, Groen and Mellenbergh in 1995. It is a self-report instrument that consists of nine items that evaluate situations related to dental treatment in which the patient manifests anxiety¹⁸. The items are presented in the form of *Yes* or *No* statements; each point is assigned a numerical value, thus obtaining a total score as a result of the sum of the scores for each item. The total score is in the range 0 and 45 points, and is classified as follows: 0-10 points, *no anxiety*; 11-19 points: *slightly anxious*; 20-27 points, *moderately anxious* and 28-45 points, *extremely anxious*. This inventory has shown good levels of confidence, validity and strong correlations in relation to dental anxiety⁴. Nevertheless, this instrument has not been validated or currently used⁸.

STATE-TRAIT ANXIETY INVENTORY (STAI)

The State-Trait Anxiety Inventory consists of forty questions, twenty of them for trait anxiety (STAI-T or T-anxiety) and another twenty for state anxiety (STAI-S or S-anxiety); the scale consists of four possible answers with a score from 0, *none* to 3, *very much*, and the range of values can be from zero to sixty points^{12, 13}. STAI scores are commonly classified as *low or no anxiety*, when the score is 20 to 37; *moderate anxiety*, from 38 to 44 points, and *high anxiety*, from 45 to 80 points¹⁵.

STAI-TRAIT

The STAI-T is the most widely used test to measure trait anxiety¹⁹; it has twenty self-assessment questions about common situations that the patient perceives as threatening, ranging from 0 to 3, from *almost never* to *almost always*¹⁷. Trait anxiety is a permanent personality characteristic of each individual emotion^{13, 19}.

STAI-STATE

The Spielberger STAI-S is one of the most used scales in anxiety research, although it is not a specific scale for dental anxiety¹⁵. This scale is used to measure state anxiety, which refers to the emotional state of the human body¹³. The State Anxiety questionnaire has twenty self-assessment questions, ranging from 0 to 3; it assesses transient emotional state on subjective feelings of stress and apprehension that tend to fluctuate in intensity over time¹⁷.

AMSTERDAM PREOPERATIVE ANXIETY AND INFORMATION SCALE (APAIS)

In 1996, Moermann's Dutch group developed the Amsterdam Preoperative Anxiety and Information Scale, which consists of six items; two of them related to surgery, two related to anaesthesia and the other two items evaluate the need to provide the patient with information about the procedure^{13, 20}. Each of the questions is evaluated with a Likert scale from 0 to 5, with 1 being the lowest value (*nothing*) and 5 being the highest value (*extremely*), with a maximum of twenty points; a value >11 is considered a *high anxiety* level²¹.

DISCUSSION

There are different scales to measure dental anxiety such as DAS, MDAS, STAI, SDAI and APAIS, whose levels vary from *no anxiety* to *very anxious*^{13, 22-26}. The scales have shown confidence and validity when applied in patients who undergo extractions of impacted third molars^{11, 27}. The DAS scale has been replaced by the MDAS scale, since its content does not include any question regarding the application of anaesthetic used in surgical procedures, which constitutes a factor causing anxiety for many patients. The MDAS scale has been translated into more languages compared to the DAS, so it can be considered the most recently used instrument in the dental area⁸. The most important scale to measure state anxiety and trait anxiety is the STAI, obtaining greater correlation and confidence when applied¹³. The SDAI is the short version of the Dental Anxiety Inventory (DAI), the original version consists of 36 items and because it is considered too long, the short version SDAI was established; however, this instrument has not been validated or used currently⁸.

The scores are related to the age and gender of the patients¹³. A decrease in anxiety has been found with increasing age of the patient; the majority of them were in the *mildly anxious* category and the minority were in the *extremely anxious* category. In relation to gender, male patients *did not present anxiety* or were *mildly anxious* compared to female patients, who were *mildly anxious* and *moderately anxious*²⁸. Studies argue that these differences in anxiety levels between sexes can be attributed to the different pain thresholds between men and women, or it is also due to the fact that women express their fears more freely than men¹³. Patients with experience in tooth extraction presented less anxiety than patients without experience in extractions, which can be attributed to the fact that patients with previous experience in tooth extraction had a more detailed understanding of the process and more adequate preparation for pain tolerance^{9, 28}.

Commonly informing patients about their treatment can increase their anxiety and may eventually discourage them from undergoing it; some studies have indicated that doctor-patient communication is the best way to relieve anxiety²⁰. The presentation of preoperative videos increased the patient's anxiety levels significantly on all scales^{21, 23}; it was shown that watching them before the surgical procedure has a negative effect on the anxiety level of the patients, because the majority presented a high level of anxiety contrary to a minimum percentage that did not present anxiety²⁴. Although, providing information to patients has been shown to help them better understand the surgical procedure and postoperative care¹¹.

It is important to use other measures to calm the patient, reinforce positive aspects for their comfort²⁴, such as music therapy, which is considered a distracting tool: music diverts painful or unpleasant actions. In the area of dentistry, it is used to reduce the anxiety that the

treatment causes, it seeks both to improve communication with the patient and to promote their relaxation during care, when the patient listens to music they tend to close their eyes and concentrate on the audio, this prevents them from focusing on the noisy instruments produced by the dental equipment, such as the high and low speed pieces that the dentist handles during surgery, thus avoiding staying alert³. The effects of music therapy reported so far are physiological, psychological and intellectual²⁵, among the former, it has been shown to modify heart rate, pulse, blood pressure, respiratory rate, and pain threshold; on the other hand, the psychological effects allow the stimulation of emotions, in addition to producing relaxation and physical sedation³. Within the theory called the Pain Gate, music acts as a distractor capable of diminishing the sensation of perceived pain, because the pleasant experience would be closing the entrance door of the painful stimulus²⁶.

The lack of studies on the scales and levels of anxiety that patients present before dental care or surgical procedures, such as the extraction of impacted third molars, constitutes a limitation, since the majority of professionals do not concern about the emotional state, sensations and bodily symptoms that the patient may manifest before entering the surgical intervention. If the professional uses a poorly prepared scale, he or she will make wrong decisions, which not only affects the patient but also the patient-dentist relationship, and ultimately the treatment.

It is important to take a good clinical history with a correct anamnesis, informed consent and the application of different scales to measure the anxiety levels of patients before undergoing the extraction of impacted third molars and then the same for postoperative control. Professionals know the different factors that lead their patients to have dental anxiety, so they try to avoid it or solve it, to provide comfort. Likewise, the different scales help to better understand the surgical procedure and its possible complications, being a fundamental prerequisite to achieve optimal dental treatment, which must be implemented in daily dental practice.

CONCLUSION

The different scales that are used to measure anxiety levels in patients who undergo extractions of impacted third molars are: DAS, MDAS, STAI, SDAI, APAIS; whose levels range from *not anxious*, being the lowest level, to *very anxious* or *dental phobia*, being the highest level; these scales are reliable and valid when they are applied.

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