USE OF DENTAL ANXIETY SCALES AND THEIR EFFICACY FOR PEDIATRIC PATIENT CARE: AN INTEGRATIVE REVIEW

https://doi.org/10.56238/sevened2025.007-001

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ABSTRACT

Introduction: The dental environment provides numerous anxiogenic factors for the patient, and may have several associated factors, such as the child's age and cultural origin, as well as the management of the dental surgeon and family anxiety. Objective: To conduct an integrative review of the literature on the use of dental anxiety scales applied to pediatric dental treatment and their efficacy. Methods: Searches were conducted in the LILACS and PubMed databases using the descriptors "Anxiety to Dental Treatment", and "Pediatric Dentistry" and "Child" and their counterparts in English and Spanish. Articles between the years 2014 and 2024 were selected. Results: The scales most cited in the literature for the subjective measurement of childhood anxiety are the RMS-PS, AES, VPT and FIS. Although divergences were found regarding their superiority, there was a positive

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correlation in the validation of the pictorial scale (RMS-PS) in the measurement of pediatric anxiety. Another result found refers to the adaptation and cultural translation into Portuguese of the Dental Anxiety Measure (CEDAM) scale, which obtained a positive understanding in Brazilian children. Conclusion: The study showed elements for the understanding of dental anxiety, with regard to the scales adapted to the pediatric patient, although more studies are needed, given the subjectivity of understanding and heterogenicity of the age groups studied, so that they are applicable to the dental office environment, by general practitioners and pediatric dentists.

Keywords: Anxiety about dental treatment. Pediatric dentistry. Weights and measures.

INTRODUCTION

Anxiety is defined as a multidimensional construction whose components are somatic, cognitive, and emotional elements, according to one of the most accepted concepts (Kendall, 2006). According to the DSM-VMannual for the Diagnosis and Statistics of Mental Disorders, one of the diagnostic criteria for anxiety is persistent excessive worry about unwanted events. (Instituto pensi, 2023).

Dental anxiety denotes a state of apprehension that something terrible is going to happen in relation to the treatment, and is associated with a feeling of loss of control (Klingberg; Broberg, 2007). In an anxious episode, psychophysiological responses occur that are capable of altering the activity of the sympathetic branch of the autonomic nervous system, thus generating changes in the cardiovascular system, such as increased blood pressure and heart rate. There is a greater production of sweat glands, leading to sweating, as well as the feeling of respiratory difficulty, with the presence of hyperventilation, one can also mention xerostomia, among other symptoms (Muinero-Lorenzo et al., 2014; Wells et al., 2012; Matsuoka et al., 2014).

The fear of going to the dentist can interfere with oral health care, generating resistance to appointments and making treatment difficult. This anxiety is associated with a higher incidence of oral and behavioral problems during care. Although anxiety related to dental treatment can affect people of all ages, its development is more common in childhood and adolescence. (Mayer et al., 2019)

The belief that they will be subjected to some type of discomfort or painful sensation during care seems to be one of the main factors that interfere in the behavior of patients. This belief or rule usually begins in childhood or adolescence and is the result of past painful experiences, lack of knowledge of the procedures to be performed, impossibility of seeing what the dentist performs during the procedure (Nathan, 2001).

Other anxiogenic factors, as Gomes, Stabile and Ximenes (2020) show, are contact with the office environment, dental chair, instruments, high and low speed motors, and also, access to negative information transmitted by other people, mostly parents, can lead to a future that generates even more fear and avoidance of dental care, thus giving rise to a vicious cycle in which running away from treatment only further aggravates the oral health condition.

The prevalence of dental anxiety may vary according to the age group, as well as the instrument used to measure it. Over time, scales to measure dental anxiety have been described by several authors. These can be divided into objective measures, such as heart

rate and blood pressure, and subjective measures, when combined, can offer a more accurate diagnosis (Muinero-Lorenzo et al., 2014).

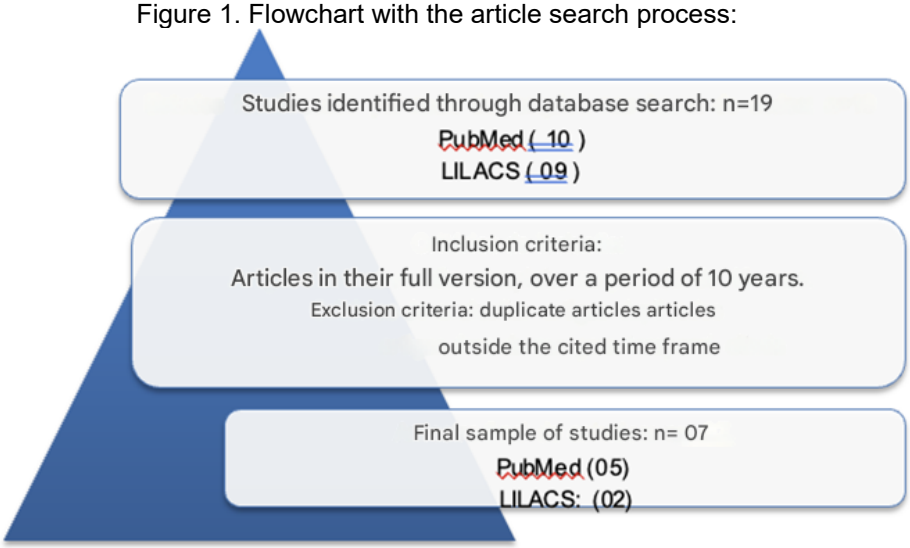
Knowledge of children's behavior and personality are characteristics of paramount importance for the success of care, in addition, interpreting the behavior of the pediatric patient allows the dentist to use appropriate techniques for the management of a given child (Matos, 2019). And for such an interpretation, it is necessary to use specific scales/tests for childhood, since there will be an understanding of what is being asked, through figures.

In this context, the present study aims to carry out an integrative review of the literature on the use of dental anxiety scales in the pediatric age group, for a greater understanding of their efficacy and clinical applicability.

METHODOLOGY

To carry out this integrative review, searches were carried out in the LILACS and PubMed databases using the descriptors", "Anxiety to Dental Treatment", "Pediatric Dentistry" and "Child" and their correspondents in English and Spanish. Articles between the years 2014 and 2024 were selected. Inclusion and exclusion criteria are contained in the flowchart below.

Figure 1. Flowchart with the article search process:



Source: Authors

RESULTS

Chart 1 – Studies on dental anxiety scales applied to children

N	Title and author	Year	Type and purpose of the study	Key findings
1	Use of an animated emoji scale as a novel tool for anxiety assessment in children. SETTY JV *et al*	2019	Systematic review. Objective of evaluating and measuring dental anxiety in the pediatric age group from 4 to 14 years, using the AES, VPT and FIS scales.	The results of this study indicate that the AES tool, although new, is the most appropriate to assess dental anxiety in children.
2	RMS Pictorial Scale (RMS-PS): an innovative scale for the assessment of child's dental anxiety. R M SHETTY, *et al*	2015	Systematic review. Study carried out with 102 children aged 4 to 14 years, with the objective of validating the pictorial scale (RMS) (RMS-PS) and comparison with the image test (VPT) and the facial image scale (FIS)	The observed results suggest that the RMS-PS may be a newer and easier method to assess dental anxiety in children in the clinical context.
3	Dental Anxiety Scales Used in Pediatric Dentistry: A Systematic Review and Meta- analysis - SHILP T., *et al*	2021	Systematic review with meta-analysis	500 matching studies were found by 2021. Of these, 13 articles included qualitative synthesis and only 7 were made for quantitative synthesis. Among the 7 studies, 5 compared the FIS and VPT scales and 2 compared RMS, FIS and VPT; Based on the statistics, no significant difference was observed between all comparisons, concluding that all scales are on equal terms to assess anxiety levels in the pediatric population.
4	Development and evaluation of the children's experiences of dental anxiety measure. PORRITT J *et al*	2018	This is a qualitative study through interviews. Objective to develop the measurement of childhood experiences of dental anxiety (CEDAM) and to evaluate the properties of the measure.	The results of the study revealed that CEDAM is a reliable and valid measure of dental anxiety in children aged 9 to 16 years.
5	Short Form of the Children's Experiences of Dental Anxiety Measure (CEDAM): Validation and Evaluation of the CEDAM-8. PORRITT JM *et al*	2021	Objective of developing a short version of CEDAM for the assessment of children's dental anxiety in clinical practice.	CEDAM-8 is a useful assessment tool for clinicians that is easy and quick to administer and can help understand pediatric dental anxiety experiences and changes in anxiety over time and after the intervention. The CEDAM in its short version, with 8 items, showed good psychometric properties, as well as was significantly correlated with the CEDAM measure ($r = 0.90$; $p < 0.01$).

6	Translation and cultural adaptation of the Children's Experiences of Dental Anxiety Measure (CEDAM) to Brazilian Portuguese SANTOS JHL *et al*	2024	The objectives of the study were to translate and adapt CEDAM's culture into Brazilian Portuguese, and its comprehension by 10 school children from 8 to 12 years of age.	The translated version was well understood by more than 85% of the participants. The Brazilian version of CEDAM was culturally adapted for the evaluated population of children
7	Validity of the Facial Image Scale (FIS) for use with Brazilian children in pediatric dentistry. Grisolia, Bárbara Monteiro.	2021	The objective of this study was to evaluate the validity of the Facial Image Scale (Facial Image Scale; FIS) in pediatric dental patients in Rio de Janeiro, Brazil.	The qualitative study found discrepancies between the choice of SFI and the child's feelings regarding anxiety about dental treatment (ATO) in all age groups. The results suggest that the SIF does not seem to be able to validly measure OAT in Brazilian children.
8	Prevalence of anxiety related to dental treatment in adolescents: an integrative review of the literature MAYER *et al.,*	2019	Objective: to determine the prevalence of anxiety related to dental treatment in adolescents through a literature review	7 articles were identified that met the inclusion criteria. The prevalence of anxiety related to dental treatment ranged from 6.5 to 25.6% among adolescents, distributed between Europe, Asia and Oceania. There was also a diversity of instruments used to assess anxiety. The prevalence of anxiety related to dental treatment showed great variability among the studies analyzed, reaching 1/4 of the adolescents. There was a lack of consistent prevalence studies in this age group.

Source: The Authors.

DISCUSSION

Dental anxiety in children is a significant concern in the field of pediatric dentistry, as it can impact the patient experience and, consequently, treatment outcomes. The integrative review carried out in this study demonstrated the diversity of scales available for the measurement of childhood anxiety in the dental context, reflecting the complexity of this psychological phenomenon.

According to the integrative review conducted by Mayer et al. (2019), the prevalence of dental anxiety among adolescents varies significantly, with rates ranging from 6.5% to 25.6% in different regions of the world, reflecting not only cultural and sociodemographic

factors, but also the diversity of instruments used to measure anxiety. This variation highlights the need for personalized approaches in dental care, which consider the particularities of each patient and seek to minimize anxiety, promoting a more positive experience in the office.

To measure anxiety in the face of dental treatment in children, the reviewed literature was broad and divergent in terms of the scales used. For SETTY JV et al., in their systematic review, focusing on the pediatric age group from 4 to 14 years, when comparing the AES (Animated Emoji Scale), VPT, (Vem Image Test) and the Facial Image Scale (FIS) scales, they observed that the AES scale was more effective, since there was greater acceptance, for children.

However, in a divergent way, SHILP T, et al (2021) when conducting a systematic review with meta-analysis, on the aforementioned scales, did not find a statistically significant difference. Such divergence can be justified by the subjectivity of children's understanding of the instruments applied.

The reviewed studies point out that the prevalence and intensity of dental anxiety vary widely among children, being influenced by factors such as age, previous experiences, and the office environment. The research by Setty et al. (2019) highlights that the animated emoji scale (AES) is effective in measuring anxiety, suggesting that visual tools that use playful elements may be more acceptable to children. This playful approach to scales is corroborated by the validation of the pictorial scale RMS-PS by R M Shetty et al. (2015), who propose that the use of images in clinical contexts can facilitate communication between dentists and young patients, reducing apprehension. There are also studies in the literature on the adaptation and cultural translation into Portuguese of international instruments, as pointed out by the studies by PORRITT J et al., which aimed to carry out a short version of the Dental Anxiety Measure - CEDAM for the assessment of childhood dental anxiety in clinical practice, whose results showed good psychometric properties. Subsequently, the same authors conducted a study to adapt this instrument, where they obtained a good understanding for Brazilian children from 8 to 12 years of age.

The limitations of this study include the lack of homogeneity in the methodologies used in the analyzed studies and the need for more longitudinal studies that can evaluate the effectiveness of the scales. In addition, many of the studies reviewed focused on a limited number of instruments, which may limit the generalizability of the results, as further research is needed to explore the relationship between anxiety scales and clinical outcomes in pediatric dental treatment, taking into account not only the effectiveness of the scales, but also the subjective experience of children during treatment. A better

understanding of dental anxiety can contribute to the development of more effective interventions and to the improvement of the treatment experience for children and their families.

CONCLUSION

Although the prevalence of dental anxiety in the pediatric age group has been studied with great expressiveness in the literature, with regard to its measurement, studies show divergences.

According to the present review, the dental anxiety scales AES (Animated Emoji Scale), VPT (Come-in Image Test), Facial Image Scale (FIS) and Pictorial Scale (RMS-PS) are the most cited in the literature to measure children's anxiety, however, there are divergences regarding superiority. Where, in the most recent systematic review with meta-analysis, no statistically significant difference was observed between them, on the other hand, the pictorial scale RMS-PS and AES, proved to be more effective for measuring pediatric anxiety, in another study mentioned above.

Furthermore, it is worth emphasizing, in the present review, studies on translation and cultural adaptation of certain scales, for application in Brazilian children, such as the Dental Anxiety Measure - CEDAM scale, which obtained positive results for understanding pediatric patients, which is thus configured as another valid instrument for dentists to measure childhood anxiety in the face of dental treatment. Finally, it can be concluded that more studies are needed on the dental anxiety scales adapted to pediatric patients, given their subjectivity of understanding and heterogenicity of the age groups studied. So that there are parameters for clinical dentists and pediatric dentists in the face of dental anxiety.

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