ATHENA - HEALTH & RESEARCH JOURNAL

2026 • Volume III • Nº Suppl.

Non-pharmacological interventions for anxiety relief in patients undergoing dental care and dental procedures: a scoping review protocol

Lídia Oliveira [1] 0009-0007-6981-903X
Maria Inês Guimarães [1,2,3,4,5] 0000-0003-3687-7798
Inês Lopes Cardoso [1,2,6,7,8] 0000-0002-0693-9831
Maria Teresa Moreira [9,10] 0000-0002-2554-697X

[1] Faculty of Health Sciences, Fernando Pessoa University, Porto, Portugal
[2] RISE-Health, Faculty of Health Sciences, Fernando Pessoa University, Porto, Portugal
[3] National Institute of Legal Medicine and Forensic Sciences - North Delegation, Porto, Portugal
[4] Centre for Health Studies and Research, University of Coimbra, Portugal
[5] Centre for Innovative Biomedicine and Biotechnology, University of Coimbra, Portugal
[6] Fernando Pessoa–Institute for Research, Innovation and Development, Fernando Pessoa University, Porto, Portugal
[7] Fernando Pessoa Biomedical and Health Sciences, Fernando Pessoa University, Porto, Portugal, Porto, Portugal
[8] School of Medicine and Biomedical Sciences, Gondomar, Portugal
[9] Fernando Pessoa School of Health, Porto, Portugal
[10] RISE-Health, Fernando Pessoa School of Health, Porto, Portugal

ARTICLE INFO

Received 15 July 2026
Accepted 14 August 2026

Keywords:
dental anxiety
dental care
non-pharmacological interventions
anxiety management
complementary therapies
dentistry

Corresponding Author:
Lídia Oliveira;
Faculty of Health Sciences - Fernando Pessoa University, Porto, Portugal;
lilo.oliveira@hotmail.com

ABSTRACT

Introduction: Dental anxiety is a significant challenge in oral healthcare, affecting patients of all ages and potentially compromising treatment adherence, cooperation during procedures, and overall clinical outcomes. Non-pharmacological interventions have increasingly been used as complementary strategies to reduce anxiety and promote patient comfort during dental care and procedures.
Objectives: To identify and map the existing scientific evidence on non-pharmacological interventions used to reduce anxiety in patients undergoing dental care and procedures.
Methodology: A scoping review will be conducted in accordance with the Joanna Briggs Institute methodological guidance and reported in line with the PRISMA-ScR recommendations. The literature search will be conducted in PubMed, MEDLINE Complete, CINAHL Ultimate, Scopus, Psychology and Behavioral Sciences Collection, RCAAP, and BASE. Search strategies will combine controlled vocabulary, where applicable, with free-text terms structured around three conceptual blocks: anxiety or dental fear, dental/oral healthcare and procedures, and non-pharmacological interventions. Quantitative, qualitative, mixed-methods, observational, experimental, quasi-experimental, descriptive, and case studies meeting the eligibility criteria will be considered for inclusion. Study selection and data extraction will be conducted independently by two reviewers, with disagreements resolved through discussion and, when necessary, consultation with a third

Contributions: Conceptualization: LO and MTM; Data curation: LO and MTM; Formal Analysis: LO and MTM; Funding acquisition: Not applicable; Investigation: LO, MIG, ILC and MTM; Methodology: LO, MIG, ILC and MTM; Project administration: MTM; Resources: MTM; Software: LO and MTM; Supervision: MTM; Validation: LO, MIG and ILC; Visualization: LO, MIG and ILC; Writing – original draft: MTM; Writing – review & editing: MIG, ILC and MTM.

Please cite this article as: Oliveira L, Guimarães MI, Cardoso IL, Moreira MT. Non-pharmacological interventions for anxiety relief in patients undergoing dental care and dental procedures: a scoping review protocol. *Athena Health & Research Journal*. 2026; 3(Suppl.). doi: 10.62741/ahrj.v3iSuppl.235

DOI: 10.62741/ahrj.v3iSuppl.235

reviewer. The study selection process will be documented using a PRISMA-ScR flow diagram. The protocol has been registered and made publicly available through the Open Science Framework 10.17605/OSF.IO/J59PG.
Expected Results: The review is expected to identify and categorise the range and characteristics of non-pharmacological interventions investigated for anxiety management during dental care and procedures, including complementary and holistic approaches, and to map the outcomes assessed and gaps in the existing evidence.
Conclusion: This scoping review is expected to provide a comprehensive mapping of non-pharmacological strategies for anxiety management in dental care, supporting evidence-informed, patient-centred practice and identifying priorities for future research.

INFORMAÇÃO DO ARTIGO

Recebido 15 julho 2026
Aceite 14 agosto 2026

Palavras-chave:
ansiedade dentária
cuidados dentários
intervenções não farmacológicas
gestão da ansiedade
terapias complementares
medicina dentária

Autor correspondente:
Lídia Oliveira;
Faculdade de Ciências da Saúde – Universidade Fernando Pessoa, Porto, Portugal;
lilo.oliveira@hotmail.com

DOI: 10.62741/ahrj.v3iSuppl.235

RESUMO

Introdução: A ansiedade associada aos cuidados e procedimentos dentários constitui um desafio relevante em saúde oral, podendo afetar doentes de diferentes grupos etários e comprometer a adesão ao tratamento, a cooperação durante os procedimentos e os resultados clínicos. Neste contexto, as intervenções não farmacológicas têm assumido crescente relevância como estratégias complementares para a gestão da ansiedade e promoção do conforto durante os cuidados dentários.
Objetivos: Identificar e mapear a evidência científica existente sobre intervenções não farmacológicas utilizadas para reduzir a ansiedade em doentes submetidos a cuidados e procedimentos dentários.
Metodologia: Será realizada uma scoping review de acordo com as orientações metodológicas do Joanna Briggs Institute e reportada em conformidade com as recomendações PRISMA-ScR. A pesquisa bibliográfica será realizada nas bases de dados PubMed, MEDLINE Complete, CINAHL Ultimate, Scopus, Psychology and Behavioral Sciences Collection, RCAAP e BASE. As estratégias de pesquisa combinarão vocabulário controlado, quando aplicável, e termos de texto livre organizados em três blocos conceptuais: ansiedade ou medo dentário, cuidados e procedimentos dentários e intervenções não farmacológicas. Serão considerados estudos quantitativos, qualitativos, de métodos mistos, observacionais, experimentais, quase-experimentais, descritivos e estudos de caso que cumpram os critérios de elegibilidade. A seleção dos estudos e a extração dos dados serão realizadas de forma independente por dois revisores. Os desacordos serão resolvidos por consenso e, quando necessário, mediante consulta de um terceiro revisor. O processo de seleção será documentado através de um fluxograma PRISMA-ScR. O protocolo foi registado e disponibilizado publicamente através da Open Science Framework 10.17605/OSF.IO/J59PG.
Resultados Esperados: Espera-se mapear os tipos e as características das intervenções não farmacológicas utilizadas na gestão da ansiedade durante os cuidados e procedimentos dentários, bem como os contextos da sua aplicação, os outcomes avaliados e as principais lacunas existentes na evidência.
Conclusões: Esta scoping review permitirá sistematizar e caracterizar a evidência disponível sobre intervenções não farmacológicas para a gestão da ansiedade em cuidados dentários, contribuindo para uma compreensão mais abrangente das estratégias existentes e para a identificação de áreas prioritárias para investigação futura.

Introduction

Dental anxiety is a common and significant challenge in oral healthcare, affecting children, adolescents, and adults undergoing dental care and dental procedures. It is characterised by fear, emotional distress, and physiological responses during dental consultations and treatments, often leading patients to postpone or avoid oral healthcare altogether.[1] This avoidance may contribute to deterioration in oral health, worsening clinical conditions, and reduced quality of life.[2]

Dental care and dental procedures are often perceived as stressful due to factors such as fear of pain, invasive techniques, previous traumatic experiences, sounds associated with dental equipment, and uncertainty about treatment outcomes.[3] These emotional responses can undermine patient cooperation, increase procedural difficulty, prolong treatment, and compromise communication between healthcare professionals and patients. In paediatric populations, dental fear and anxiety may also interfere with behavioural management and future adherence to oral healthcare.[4]

Traditionally, pharmacological approaches such as sedation and anxiolytic medication have been used to manage anxiety during dental procedures. Although these approaches may be clinically appropriate in selected situations, their use may be associated with adverse effects, safety concerns, the need for additional monitoring, increased costs, and limitations in patient acceptability. These considerations have contributed to growing interest in non-pharmacological approaches that may be used independently or as complementary strategies and that emphasise patient comfort, participation, and patient-centred care. Non-pharmacological interventions encompass established behavioural and psychological approaches, such as relaxation, hypnosis, and cognitive-behavioural strategies, as well as complementary and technology-assisted approaches, including music therapy, aromatherapy, audiovisual distraction, and virtual reality technologies.[5,6] However, increasing attention has been directed towards non-pharmacological interventions because of concerns about adverse effects, patient safety, costs, and the growing need for more holistic and patient-centred approaches.[5] Non-pharmacological interventions include behavioural techniques, music therapy, aromatherapy, relaxation techniques, hypnosis, distraction methods, cognitive-behavioural strategies, audiovisual resources, and virtual reality technologies.[6]

Recent evidence shows promising results for these interventions in reducing anxiety and improving patient comfort during dental procedures. A recent network meta-analysis identified music therapy, aromatherapy, and game-based distraction as some of the most effective interventions for reducing dental anxiety in paediatric dentistry.[4] Similarly, virtual reality and audiovisual distraction strategies have shown positive effects on anxiety reduction during dental extractions and invasive procedures.[7] Furthermore, systematic reviews have demonstrated that music therapy significantly reduces stress and anxiety prior to dental treatment, representing a safe and non-invasive alternative to pharmacological approaches.[1]

Despite the growing body of evidence, the literature on non-pharmacological interventions for anxiety management in dental care and procedures remains heterogeneous, with variations in populations, intervention types, methodologies, and outcome measures. Existing studies are dispersed across dental specialties and age groups, making it difficult to obtain an integrated overview of the available evidence. Therefore, a scoping review is considered the most appropriate methodological approach to systematically map the range, characteristics, and nature of non-pharmacological interventions used to alleviate anxiety in patients undergoing dental care and procedures.

A preliminary search for existing evidence syntheses identified several systematic reviews, meta-analyses, network meta-analyses, and scoping reviews addressing non-pharmacological approaches to anxiety management in dental care. However, these reviews have generally focused on specific interventions, populations, or dental procedures. For example, Hao et al. examined virtual reality, audiovisual, and music interventions specifically in relation to dental anxiety associated with tooth extraction,[3] while Kong et al. evaluated non-pharmacological interventions specifically in paediatric dentistry.[4] Steenen et al. focused on interventions targeting state anxiety, dental trait anxiety, and dental phobia in adults,[8] whereas Bleyen et al. specifically mapped the use of virtual reality to reduce pain and anxiety before or during dental procedures.[9] In addition, Aarvik et al. conducted a scoping review of psychological interventions for patients with severe dental anxiety or dental phobia and patients with a history of torture or abuse.[10] Collectively, these evidence syntheses demonstrate growing interest in non-pharmacological anxiety management in dentistry, while also showing that previous reviews have predominantly addressed particular intervention modalities, populations, or clinical circumstances.

The present scoping review differs from these previous evidence syntheses by adopting a broader mapping approach across the spectrum of non-pharmacological interventions used for anxiety management during dental care and procedures. Rather than focusing on the comparative effectiveness of a single intervention or restricting the analysis to a specific age group, procedure, or clinical population, this review will characterise the types and features of interventions investigated, the populations and clinical contexts in which they have been applied, the anxiety assessment methods and outcomes reported, and gaps in the available evidence. This broader perspective is expected to provide an integrated overview of the field and to identify areas that remain insufficiently explored.

This scoping review aims to identify and map existing scientific evidence on non-pharmacological interventions for anxiety relief in patients undergoing dental care and procedures, contributing to the development of evidence-informed and patient-centred practices in oral healthcare.

Methodology

Study design

This study will consist of a scoping review to map and synthesise the existing scientific evidence on non-pharmacological interventions for relieving anxiety in patients undergoing dental care and dental procedures. A scoping review was considered the most appropriate methodological approach because the available literature on this topic is broad, heterogeneous, and encompasses diverse study designs, populations, interventions, and clinical contexts. Furthermore, this type of review helps identify existing knowledge gaps and provides a comprehensive overview of the extent, nature, and characteristics of the available evidence.[11,12]

The review will be conducted in accordance with the methodological guidance proposed by the Joanna Briggs Institute (JBI) for scoping reviews and reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).[11,13] These frameworks aim to ensure transparency, methodological rigour, reproducibility, and consistency throughout all stages of the review process. This scoping review has been registered and made publicly available

through the Open Science Framework (OSF) at: DOI: 10.17605/OSF.IO/J59PG.

The research question was structured according to the Population, Concept, and Context (PCC) framework recommended by the JBI methodology for scoping reviews: Population (P): Patients of any age, including children, adolescents, adults, and older adults, undergoing dental care or dental procedures; Concept (C): Non-pharmacological interventions aimed at preventing, reducing, or managing dental anxiety, dental fear, or procedural anxiety occurring before or during dental care or dental procedures; Context (C): Dental and oral healthcare settings, including general and specialised dental practice and preventive, diagnostic, restorative, endodontic, periodontal, orthodontic, paediatric, prosthodontic, and oral surgical care.

Eligibility criteria

Eligibility criteria were defined according to the Population, Concept, and Context (PCC) framework and the objectives of the scoping review. All types of primary empirical studies meeting the predefined PCC criteria will be considered eligible, regardless of study design.

Inclusion criteria

Regarding the Population, studies involving patients of any age, including children, adolescents, adults, and older adults, undergoing dental care or dental procedures will be eligible for inclusion.

Regarding the Concept, studies investigating non-pharmacological interventions aimed at preventing, reducing, or managing anxiety or fear associated with dental care will be considered eligible. This includes dental anxiety, dental fear, and procedural anxiety occurring before or during dental care or dental procedures. Eligible interventions may include, but are not limited to, music therapy, aromatherapy, behavioural and cognitive-behavioural interventions, relaxation techniques, distraction strategies, hypnosis, audiovisual resources, virtual reality, complementary therapies, and other non-pharmacological approaches intended to reduce anxiety, fear, or emotional distress associated with dental care.

Regarding the Context, we will consider studies conducted in eligible dental and oral healthcare settings. These may include general and specialised dental practice and preventive, diagnostic, restorative, endodontic, periodontal, orthodontic, paediatric, prosthodontic, and oral surgical care. We will not restrict the search by specific dental clinical setting or age group, provided the study meets the predefined Population, Concept, and Context criteria.

We will consider all primary empirical studies meeting these criteria, regardless of methodological design. Eligible study designs may include quantitative, qualitative, mixed-methods, experimental, quasi-experimental, observational, descriptive, cross-sectional, longitudinal, cohort, case-control, case studies, and case reports. We will include studies published in English or Portuguese.

Exclusion criteria

Studies will be excluded if they: (1) involve populations or clinical contexts unrelated to dental or oral healthcare; (2) focus exclusively on pharmacological interventions, pharmacological anxiolysis, or sedation techniques without an eligible non-pharmacological intervention; (3) address anxiety disorders or other psychological conditions without a specific relationship to dental care or dental procedures; (4) do not investigate a non-pharmacological intervention aimed at preventing, reducing, or managing dental anxiety, dental fear, or procedural anxiety; or (5) do not provide sufficient empirical information to address the review question.

Review articles and evidence syntheses, including systematic reviews, scoping reviews, narrative reviews, integrative reviews, and meta-analyses, as well as study protocols without empirical results, will be excluded from the final evidence sample. However, relevant review articles identified during the screening process will be retained for citation searching. We will manually screen their reference lists and, where available, lists of included studies to identify potentially eligible primary studies that may not have been retrieved through the electronic database searches. We will assess any additional primary studies identified through this process against the same predefined eligibility criteria before inclusion in the review. Editorials, commentaries, opinion papers, letters without original empirical data, conference abstracts without sufficient empirical information, and other publications that do not provide eligible primary empirical evidence will also be excluded. Studies for which sufficient information cannot be obtained to determine eligibility or extract the data required for the review will be excluded.

Search strategy

The search strategy for this scoping review followed the three-step approach recommended by the Joanna Briggs Institute (JBI).

In the first stage, a preliminary limited search identified relevant keywords, indexed terms, and terminology used in the literature on anxiety associated with dental care and non-pharmacological interventions. The terms identified through this preliminary search informed the development and refinement of the final search strategy.

In the second stage, a comprehensive electronic search was conducted across PubMed, MEDLINE Complete, CINAHL Ultimate, Scopus, Psychology and Behavioral Sciences Collection, RCAAP, and BASE. The search strategy was structured around three core conceptual blocks: (1) anxiety and dental fear; (2) dental/oral healthcare and procedures; and (3) non-pharmacological interventions. Controlled vocabulary, including Medical Subject Headings (MeSH) and database-specific subject headings where applicable, was combined with free-text terms. Boolean operators ("AND" and "OR") were used to combine the conceptual blocks and their respective synonyms. The search syntax was adapted to each database's indexing system and search functionality to maximise sensitivity and comprehensiveness. We applied no methodological or publication-date filters. Table 1 presents the complete database-specific search strategies, search dates, and number of records retrieved.

In the third stage, we will manually screen the reference lists of the studies included in the review to identify additional potentially eligible publications not retrieved through the electronic database searches. We will also conduct an updated search before completing the review to identify any newly published studies relevant to the review question (Table 1).

Table 1. Search strategy by databases and respective results.

Database: PubMed Filters: none Results: 1,317 Search string: (13.09.2026) ("Dental Anxiety"[Mesh] OR "Anxiety"[Mesh] OR "dental anxiety"[Title/Abstract] OR "dental fear"[Title/Abstract] OR "procedural anxiety"[Title/Abstract] OR anxi*[Title/Abstract] OR fear*[Title/Abstract]) AND ("Dental Care"[Mesh] OR "Dentistry"[Mesh] OR "Oral Health"[Mesh] OR "Dental Care for Children"[Mesh] OR "dental care"[Title/Abstract] OR "dental treatment*"[Title/Abstract] OR "dental procedure*"[Title/Abstract] OR "oral healthcare"[Title/Abstract] OR dentist*[Title/Abstract] OR orthodont*[Title/Abstract] OR "tooth extraction"[Title/Abstract] OR "dental surgery"[Title/Abstract]) AND ("Complementary Therapies"[Mesh] OR "Behavior Therapy"[Mesh] OR "Cognitive Behavioral Therapy"[Mesh] OR "Music Therapy"[Mesh] OR "Aromatherapy"[Mesh] OR "Relaxation Therapy"[Mesh] OR "Virtual Reality"[Mesh] OR nonpharmacolog*[Title/Abstract] OR "non-pharmacological"[Title/Abstract] OR "music therapy"[Title/Abstract] OR aromatherap*[Title/Abstract] OR relaxation[Title/Abstract] OR distraction[Title/Abstract] OR hypnosis[Title/Abstract] OR "cognitive behavio*"[Title/Abstract] OR "behavio* therapy"[Title/Abstract] OR "virtual reality"[Title/Abstract] OR audiovisual[Title/Abstract] OR "complementary therap*"[Title/Abstract])
Database: Medline complete (via EBSCO) Filters: none Results: 1,595 Search string (13.08.2026) (anxi* OR "dental anxiety" OR "dental fear" OR "procedural anxiety" OR fear*) AND ("dental care" OR dentist* OR dentistry OR "dental treatment*" OR "dental procedure*" OR "oral health care" OR "oral healthcare" OR orthodont* OR "tooth extraction" OR "dental surgery") AND (nonpharmacolog* OR "non-pharmacological" OR "music therapy" OR aromatherap* OR relaxation OR distraction OR hypnosis OR "cognitive behavio*" OR "behavio* therapy" OR "virtual reality" OR audiovisual OR "complementary therap*")
Database: RCAAP Filters: none Results: 16 Search string (13.08.2026) ("ansiedade dentária" OR "medo dentário") AND ("tratamento dentário" OR "cuidados dentários" OR dentária) AND (terapia OR intervenção OR relaxamento OR distração)
Database: Base Filters: none Resultados: 68 Search string: (13.08.2026) "dental anxiety" AND "non-pharmacological"
Database: Scopus Filters: none Resultados: 5,310 Search string: (13.08.2026) TITLE-ABS-KEY((anxi* OR "dental anxiety" OR "dental fear" OR "procedural anxiety" OR fear*) AND (dent* OR "oral health" OR "oral healthcare") AND (nonpharmacolog* OR "non-pharmacological" OR intervention* OR therap* OR "music therapy" OR aromatherap* OR relaxation OR distraction OR hypnosis OR "cognitive behavio*" OR "behavio* therapy" OR "virtual reality" OR audiovisual OR "complementary therap*"))

Search strategies will be adapted to each database's indexing system, including Medical Subject Headings (MeSH) and other controlled vocabularies where applicable. No methodological filters will initially be applied to maximise search sensitivity and minimise the risk of excluding potentially relevant studies.[14]

In the third stage, the reference lists of all included studies will be manually screened to identify additional relevant publications that may not have been retrieved through the electronic searches. An updated search will also be performed before completion of the review to identify newly published studies relevant to the topic.

Study selection

All records identified through the search strategy will be exported to Rayyan, an online platform for systematic and scoping review management, where reviewers will identify and remove duplicate records.[15]

Before formal screening begins, reviewers will conduct a pilot calibration exercise to ensure consistent interpretation and application of the predefined eligibility criteria. Both reviewers will independently assess a sample of records, then compare their decisions and discuss any discrepancies or uncertainties. As needed, the eligibility criteria and screening guidance will be clarified before proceeding to full screening.

Following calibration, two reviewers will independently screen all titles and abstracts in Rayyan using blinded screening, ensuring that each reviewer makes eligibility decisions without access to the other reviewer's decisions. Records considered potentially eligible will proceed to full-text assessment.

Before full-text screening, the team will conduct a second calibration exercise using a sample of potentially eligible articles. Following this calibration, the two reviewers will independently and blindly assess the full texts against the predefined eligibility criteria in Rayyan. Reviewers will record reasons for exclusion at the full-text stage.

After each screening stage, blinding will be removed, and reviewers' decisions will be compared. Reviewers will initially resolve disagreements through discussion and consensus. When consensus cannot be reached, a third reviewer will be consulted.

The complete study selection process will be documented using a PRISMA-ScR flow diagram [13], including the number of records identified, duplicates removed, records screened, full-text articles assessed, reasons for full-text exclusion, and studies included in the review.

Data extraction

Two reviewers will conduct data extraction independently using a standardised data charting form developed by the authors for this review, based on the review objectives, research question, PCC framework, and JBI methodological guidance for scoping reviews.[11] The variables included in

the form were therefore defined a priori by the review team rather than derived from a specific established checklist.

Before the formal extraction process begins, a pilot test will be conducted using a small sample of included studies to ensure consistency between reviewers and adequacy of the extraction instrument (Table 2).

If necessary, the authors of included studies may be contacted to obtain additional information or clarify missing data relevant to the review.

Data analysis and presentation

The extracted data will be analysed descriptively and synthesised using a narrative approach consistent with the objectives of a scoping review.[11,16]

The results will be organised into thematic categories based on the types of non-pharmacological interventions identified and on their reported effects in reducing anxiety during dental care and procedures.

Tables, charts, and schematic representations will summarise the characteristics of the included studies, including study design, population characteristics, intervention types, clinical contexts, anxiety assessment instruments, and principal outcomes.

The synthesis will map the range, extent, and nature of the available evidence rather than evaluate intervention effectiveness through statistical pooling.

In line with methodological recommendations for scoping reviews, this review will not conduct a formal methodological quality appraisal or risk-of-bias assessment, as its primary objective is to identify, map, and describe the existing evidence and highlight knowledge gaps.[11,17]

This review's findings are expected to contribute to a broader understanding of non-pharmacological approaches to anxiety management in dental settings, support evidence-informed clinical practice, and guide future research in oral healthcare.

Synthesis of results

The synthesis of results will adopt a descriptive and narrative approach, consistent with the objectives and methodological recommendations for scoping reviews.[11,13] The primary aim of the synthesis will be to map, organise, and summarise the existing scientific evidence on non-pharmacological interventions to reduce anxiety in patients undergoing dental care and procedures.

Before full data charting, two reviewers will independently pilot-test the proposed charting form on a sample of included evidence sources. They will compare the charted data and discuss any discrepancies, ambiguities, or difficulties encountered when applying the form. Based on this pilot, the team may refine the charting form to ensure it adequately captures the information needed to address the review question and objectives. Consistent with the iterative nature of scoping reviews, the team may make further refinements during the charting process if additional relevant variables emerge. The review team will agree on any modifications to the charting form and transparently document and report them in the final scoping review. Extracted data will be organised into tables and thematic categories, as shown in Table 2.

Table 2. Data extraction and charting framework.

Title of scoping review	Non-Pharmacological Interventions for Anxiety Relief in Patients Undergoing Dental Care and Procedures: A Scoping Review Protocol
Objetive	To identify and map the existing scientific evidence on non-pharmacological interventions used to prevent, reduce, or manage anxiety or fear in patients undergoing dental care and procedures.
Research question	What non-pharmacological interventions have been reported to reduce anxiety during dental care and procedures?
Inclusion/exclusion criteria	Inclusion: Primary empirical studies involving eligible patients undergoing dental care or procedures and investigating a non-pharmacological intervention aimed at preventing, reducing, or managing dental anxiety, dental fear, or procedural anxiety. Quantitative, qualitative, mixed-methods, observational, experimental, quasi-experimental, descriptive, and case studies Exclusion: Studies unrelated to dental or oral healthcare; studies focusing exclusively on pharmacological interventions or sedation; studies addressing anxiety disorders or psychological conditions without a specific relationship to dental care; studies not evaluating an eligible non-pharmacological intervention; editorials, expert opinions, conference abstracts, protocols without results, and publications without eligible empirical evidence
Population	Patients of any age undergoing dental care or dental procedures.
Context	Non-pharmacological interventions aimed at preventing, reducing, or managing dental anxiety, dental fear, or procedural anxiety occurring before or during dental care or procedures.
Concept	Dental and oral healthcare settings, including general and specialised dental practice and preventive, diagnostic, restorative, endodontic, periodontal, orthodontic, paediatric, prosthodontic, and oral surgical care.
Type of evidence	All types of primary empirical studies meeting the predefined PCC criteria, regardless of study design. Review articles, evidence syntheses, and study protocols without empirical results will be excluded.
Details and characteristics of the source	
Autor; Year of publication; Country of origin	
Study Design	Study design and methodological approach
Population and sample; Clinical setting; dental procedure	Participant characteristics, age group and sample size Type of dental/oral healthcare setting Type of dental care or procedure performed
Intervention category; Intervention description	Category/type of non-pharmacological intervention Components and characteristics of the intervention
Timing, Duration and Frequency	Timing of delivery, duration and frequency of the intervention, when applicable
Comparator	Comparator/control intervention, when applicable
Anxiety/fear construct	Dental anxiety, dental fear, procedural anxiety, or other eligible dental care-related anxiety/fear construct
Assessment instrument; Timing of assessment	Instrument or method used to assess anxiety/fear Time point(s) at which anxiety/fear was assessed
Outcc	Patient-reported, behavioural, physiological and other relevant outcomes
Main findings	Principal findings relevant to the re-view question
Implementation barriers/facilitators	Barriers and facilita-tors related to in-tervention imple-mentation, when reported

Relevant conclusions	Main conclusions relevant to the scoping review question

The identified interventions will be grouped by conceptual similarity and clinical application. Potential categories may include:

behavioural and cognitive-behavioural interventions; distraction-based interventions;
music therapy; aromatherapy; virtual reality and audiovisual technologies; relaxation and holistic approaches.

A descriptive summary of the included studies will also be provided, including country of origin, year of publication, methodological design, participant characteristics, and principal findings.

The results will be presented through narrative synthesis, supported by summary tables, charts, and schematic representations to facilitate the visualisation and interpretation of the available evidence.[16]

As recommended for scoping reviews, we will not perform a meta-analysis or formal methodological quality assessment, since the primary objective of this review is to map the extent, nature, and characteristics of the evidence rather than determine intervention effectiveness.[11,17]

The synthesis of results is expected to identify current trends, evidence gaps, and areas requiring further research on anxiety management using non-pharmacological interventions in dental settings.

Expected Results

This scoping review is expected to provide a comprehensive mapping of the existing scientific evidence on non-pharmacological interventions to reduce anxiety in patients undergoing dental care and dental procedures. Given the growing recognition of anxiety as a significant barrier to oral healthcare, the review is anticipated to contribute to a broader understanding of the range, characteristics, and applicability of non-pharmacological strategies in dental care procedures.

The review is expected to identify the most commonly studied interventions for reducing anxiety, including music therapy, aromatherapy, behavioural and cognitive-behavioural interventions, relaxation techniques, distraction-based approaches, hypnosis, audiovisual resources, virtual reality technologies, and complementary or holistic therapies.[1-7] It is also expected to map how reported outcomes and applicability vary across patient age groups, types of dental procedures, clinical settings, and anxiety assessment methods.

Additionally, this review is expected to identify the principal outcomes evaluated in the literature, including reductions in self-reported anxiety levels, physiological indicators of anxiety, behavioral cooperation during procedures, treatment adherence, and patient satisfaction.

Methodologically, the review is also expected to map the diversity of study designs, instruments used to assess dental anxiety, and the clinical contexts in which these interventions are applied. This mapping may reveal methodological inconsistencies and highlight limitations in the current evidence base.

Furthermore, the review is expected to identify key knowledge gaps, particularly regarding underexplored interventions, specific patient populations, the long-term effects of interventions, and the implementation of innovative technologies, such as virtual and extended reality, in dental care settings.

The findings of this scoping review may inform the development of evidence-informed, patient-centred approaches to anxiety management in dentistry, helping healthcare professionals select and implement non-pharmacological strategies to improve patient comfort, treatment adherence, and overall quality of care. Additionally, the review may inform future research directions and support the development of clinical guidelines and recommendations for anxiety management in oral healthcare.

Discussion

As this manuscript presents a scoping review protocol, this discussion focuses on the rationale for the proposed review, its anticipated contribution to the field, and its expected methodological strengths and limitations, rather than on completed review findings.

Dental anxiety remains a significant barrier to oral healthcare, adversely affecting patient cooperation, treatment adherence, and overall clinical outcomes. Recent systematic reviews and meta-analyses have highlighted growing interest in non-pharmacological approaches to anxiety management, including music therapy, behavioural interventions, aromatherapy, distraction techniques, hypnosis, and immersive technologies such as virtual and extended reality.[1–7] These interventions have shown promising potential to improve the patient experience while avoiding the risks and costs associated with pharmacological strategies.

The rationale for this scoping review stems from the apparent fragmentation of the literature across patient populations, dental specialities, intervention modalities, and anxiety assessment methods. While several systematic reviews have focused on individual interventions such as music therapy, virtual reality, aromatherapy, or behavioural techniques,[1-7] no comprehensive synthesis currently maps the full spectrum of non-pharmacological interventions used across dental care and procedures. This heterogeneity limits clinicians' and researchers' ability to obtain an integrated overview of existing evidence and identify areas needing further investigation.

Given the broad and exploratory nature of this topic, a scoping review represents the most appropriate methodological approach to systematically identify, map, and categorise the available evidence. Scoping reviews are particularly valuable for examining complex fields characterised by diverse study designs, interventions, and outcomes, while also identifying knowledge gaps and informing future research priorities.[11-13,17] Furthermore, adherence to the Joanna Briggs Institute methodological guidance and the PRISMA-ScR reporting

recommendations enhances the review's transparency, reproducibility, and methodological rigour.[11-13]

This review is expected to provide a comprehensive overview of non-pharmacological interventions under investigation for anxiety management during dental care and procedures, including both well-established approaches and emerging technologies. In particular, recent advances in virtual and extended reality, together with growing evidence supporting music therapy, cognitive-behavioural interventions, and aromatherapy, suggest that anxiety management in dentistry is evolving towards more patient-centred and technology-assisted care.[1-7] Mapping these interventions may help clinicians identify strategies applicable across different age groups, clinical procedures, and healthcare settings.

In addition to summarising the available evidence, this review is expected to identify methodological gaps in the literature. Variability in intervention protocols, anxiety assessment instruments, study populations, and clinical contexts may hinder comparisons across studies and limit the development of evidence-based recommendations. Identifying these inconsistencies may promote greater methodological standardisation and inform the design of future primary studies and systematic reviews.

The findings of this review may also have important implications for clinical practice. By providing a structured overview of available non-pharmacological interventions, the review may help oral healthcare professionals select patient-centred strategies that improve comfort, reduce emotional distress, enhance treatment adherence, and ultimately contribute to better oral health outcomes. Furthermore, mapping the current evidence may inform educational initiatives and the future development of clinical guidelines for anxiety management in dentistry.

Some limitations should be acknowledged. Consistent with the objectives of a scoping review, this study will not undertake a formal critical appraisal of methodological quality or risk of bias, as recommended by current methodological guidance.[11,13,17] Consequently, the review will provide a descriptive mapping of the available evidence rather than conclusions regarding the comparative effectiveness of individual interventions.

Overall, this scoping review is expected to provide a comprehensive synthesis of the existing literature on non-pharmacological interventions for anxiety management in dental care and procedures, to support evidence-informed practice, and identify priorities for future research in this rapidly evolving field.

Conclusion

This scoping review protocol sets out a transparent, structured, and reproducible method for systematically identifying and mapping the existing scientific evidence on non-pharmacological interventions for anxiety relief in patients undergoing dental care and procedures. By applying a comprehensive search strategy, predefined eligibility criteria, independent and blinded study selection, and a standardised, pilot-tested data-charting process, the protocol aims to ensure methodological rigour and consistency throughout the review.

The proposed review will provide a broad overview of the types and characteristics of non-pharmacological interventions investigated across different patient populations, dental procedures, and clinical settings, as well as the anxiety assessment methods and outcomes reported in the literature. This mapping approach will also help identify areas where evidence is concentrated and gaps that may warrant further investigation.

By integrating evidence across diverse non-pharmacological approaches rather than focusing on a single intervention, population, or dental procedure, the review is expected to provide a comprehensive perspective on the current evidence landscape. Its findings may inform future research priorities and contribute to the development of evidence-informed and patient-centred approaches to anxiety management in dental and oral healthcare.

References

1. López-Valverde N, López-Valverde A, Macedo de Sousa B, Blanco Rueda JA. Efficacy of music therapy on stress and anxiety prior to dental treatment: a systematic review and meta-analysis of randomized clinical trials. Front Psychiatry. 2024;15:1352817. doi:10.3389/fpsyt.2024.1352817.
2. Almarzouq SSFS, Chua H, Yiu CKY, Lam PPY. Effectiveness of non-pharmacological behavioural interventions in managing dental fear and anxiety among children: a systematic review and meta-analysis. Healthcare (Basel). 2024;12(5):537. doi:10.3390/healthcare12050537.
3. Hao T, Pang J, Liu Q, et al. A systematic review and network meta-analysis of virtual reality, audiovisuals and music interventions for reducing dental anxiety related to tooth extraction. BMC Oral Health. 2023;23:684. doi:10.1186/s12903-023-03407-y.
4. Kong X, Song N, Chen L, Li Y, et al. Non-pharmacological interventions for reducing dental anxiety in pediatric dentistry: a network meta-analysis. BMC Oral Health. 2024;24:1151. doi:10.1186/s12903-024-04919-x.
5. Abdalhai R, Kouchaji C, Alkhatib R. The effect of aromatherapy with Lavender-Neroli oil and music in management of pediatric dental anxiety: a randomized control trial. BDJ Open. 2024;10:5. doi:10.1038/s41405-024-00186-8.
6. Nezhad HM, Ashourioun A, Sadeghdaghighi A. The effect of virtual reality for anxiety and pain in dentistry: a systematic review and meta-analysis. Community Dent Health. 2024;41(4). doi:10.1922/CDH_00160Nezhad08.
7. Liu Y, Gu Z, Wang Y, Li X, Wang Y, Zhang C. Extended reality technology for alleviating adult dental anxiety: a systematic review and meta-analysis of randomized controlled trials. J Dent. 2025;153:105544. doi:10.1016/j.jdent.2024.105544.
8. Steenen SA, Linke F, van Westrhenen R, de Jongh A. Interventions to reduce adult state anxiety, dental trait anxiety, and dental phobia: A systematic review and meta-analyses of randomized controlled trials. J Anxiety Disord. 2024;105:102891. doi:10.1016/j.janxdis.2024.102891.
9. Bleyen S, et al. Virtual reality for patients with dental anxiety: A scoping review. J Dent. 2025;160:105905. doi:10.1016/j.jdent.2025.105905.
10. Aarvik RS, Berge KG, Agdal ML, Bryne E. Treating dental anxiety for patients with a trauma history or severe dental anxiety: A scoping review. 2025. doi:10.1111/eos.70018.
11. Peters MDJ, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil H. Chapter 11: Scoping Reviews. In: Aromataris E, Munn Z, editors. JBI Manual for Evidence Synthesis. Adelaide: Joanna Briggs Institute; 2020.

12. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19-32. doi:10.1080/1364557032000119616.
13. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med. 2018;169(7):467-473. doi:10.7326/M18-0850.
14. Bramer WM, de Jonge GB, Rethlefsen ML, Mast F, Kleijnen J. A systematic approach to searching: an efficient and complete method to develop literature searches. J Med Libr Assoc. 2018;106(4):531-541. doi:10.5195/jmla.2018.283.
15. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan — a web and mobile app for systematic reviews. Syst Rev. 2016;5:210. doi:10.1186/s13643-016-0384-4.
16. Peters MDJ, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil H. Scoping Reviews (2020). In: Aromataris E, Lockwood C, Porritt K, Pilla B, Jordan Z, editors. JBI Manual for Evidence Synthesis. JBI; 2024. doi:10.46658/JBIMES-24-09.
17. Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. Implement Sci. 2010;5:69. doi:10.1186/1748-5908-5-69.