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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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ASSESSMENT AND NONPHARMACOLOGICAL GUIDANCE OF CHILDREN'S BEHAVIOR AND DENTAL ANXIETY IN PEDIATRIC DENTISTRY: A STRUCTURED NARRATIVE REVIEW

Tamta Chikobava[1,2]*, Ann Margvelashvili[1,3,4], Manana Kalandadze[1], Nino Tebidze[2], Vladimer Margvelashvili[1].

[1]Tbilisi State University, Chavchavadze Ave 1, 0179, Tbilisi, Georgia.

[2]BAU International University, Batumi, Fridon Khalvashi str. 237, Batumi, Georgia.

[3]Georgian National Museum, Purtseladze str. 3, 0105, Tbilisi, Georgia.

[4]University of Georgia, Kostava str. 77a, 0171, Tbilisi, Georgia.

Abstract.

Aim of study: To synthesize clinically relevant evidence on behavioral and dental-anxiety assessment in children and on nonpharmacological behavior-guidance techniques used during pediatric dental care.

Material and methods: A structured narrative review was conducted using PubMed and Google Scholar. The formal evidence set comprised 25 eligible publications selected from 96 unique records retained after search consolidation. Three additional sources (a current professional guideline, a seminal pre-2000 pediatric source, and an adult study used only for contextual distinction) were retained outside the formal synthesis, yielding 28 cited references overall. Studies focused on pediatric populations, behavioral or dental-anxiety assessment, and nonpharmacological guidance. Studies centered on adults, children with special health care needs, or pharmacological management were excluded from the formal synthesis.

Results: Age, baseline dental anxiety, temperament, previous experience, and family factors were repeatedly associated with cooperation. The Frankl Behavior Rating Scale remains clinically practical for observed behavior, whereas pictorial self-report scales can improve anxiety assessment in children able to understand them. Evidence supports individualized, communication-based guidance. Distraction, music, audiovisual or virtual-reality approaches, modelling, and other sensory strategies can reduce anxiety or pain in selected settings, but comparative effectiveness is heterogeneous and no single technique is universally superior.

Conclusions: Behavioral assessment and anxiety measurement should be matched to developmental level and combined with individualized, family-centered guidance. Current evidence favors flexible selection and reassessment of nonpharmacological techniques rather than uniform use of a single intervention.

Key words. Pediatric dentistry, dental anxiety, child behavior, behavior guidance, Frankl scale, nonpharmacological intervention.

Introduction.

Successful pediatric dental care depends not only on technical treatment but also on the clinician's ability to recognize fear, anxiety, pain-related distress, and cooperation. Dental fear and anxiety can alter attendance, communication, tolerance of procedures, and the feasibility of completing care. In young children these states may be expressed behaviorally rather than verbally, which makes rapid clinical assessment especially important [1-4].

Behavior guidance is currently understood as a continuous, individualized process rather than a single technique. The American Academy of Pediatric Dentistry (AAPD) emphasizes communication, patient-specific planning, informed consent, pain assessment, treatment urgency, previous behavior, prior guidance experiences, and alternatives to treatment when a guidance plan is selected. Basic approaches include communication guidance, tell-show-do, ask-tell-ask, positive reinforcement, distraction, desensitization, and related techniques; advanced options such as protective stabilization, sedation, and general anesthesia require separate indications, safeguards, and documentation. The present review focuses on nonpharmacological approaches in typically developing children. Advanced and pharmacological techniques are mentioned only to define the professional context and are not treated as evidence included in the review synthesis [5].

Assessment and guidance should also be distinguished conceptually. An observed behavior rating describes what the child does in the dental setting, whereas a dental-anxiety instrument attempts to measure the child's internal emotional response. The Frankl Behavior Rating Scale is widely used because it is brief and directly applicable chairside, but it does not quantify anxiety as a separate construct. Pictorial and questionnaire-based anxiety scales can add information, although their usefulness depends on age, cognitive development, language, and the child's ability to self-report [6,7].

Recent evidence has expanded substantially. Systematic reviews and meta-analyses published since 2022 show that nonpharmacological interventions can improve selected anxiety, pain, physiological, or cooperation outcomes, but results vary by age, procedure, comparator, instrument, and intervention delivery. This heterogeneity makes broad claims of universal effectiveness inappropriate. The clinically relevant question is therefore not whether every technique works equally well, but how assessment can guide selection of the most appropriate approach for a particular child [8-11].

The aim of this structured narrative review was to synthesize evidence on two linked domains: (1) clinical assessment of children's behavior and dental anxiety, including the practical strengths and limitations of commonly used tools; and (2) nonpharmacological behavior-guidance strategies used during pediatric dental care, with emphasis on age-related factors, comparative findings, clinical applicability, and limitations of the evidence.

Materials and Methods.

Review design:

The article was structured as a narrative review with an explicit search, eligibility, selection, and synthesis framework. It was not designed or registered as a systematic review or meta-analysis; consequently, no pooled effect estimate was calculated and no formal study-level risk-of-bias instrument was applied. The structured narrative approach was selected because the review integrates heterogeneous evidence on observational behavior ratings, self-reported anxiety instruments, randomized behavioral interventions, observational studies, evidence syntheses, and professional guidance. The evidentiary role of each design was considered separately during interpretation rather than treating all sources as methodologically equivalent.

Information sources and search strategy:

PubMed and Google Scholar were used for the literature search. The original evidence search covered publications from January 1, 2000 through December 31, 2025. For reproducibility and interpretive updating, the search was repeated on September 10, 2026 to identify recent reviews, meta-analyses, and current professional guidance. In PubMed, the core search logic was: (child* OR pediatric OR paediatric) AND (dent* anxiety OR dental fear OR behavior OR behaviour) AND (Frankl OR scale OR assessment OR behavior guidance OR behaviour management OR distraction OR tell-show-do OR virtual reality OR music). Additional focused combinations paired pediatric-dentistry terms with "anxiety scale", "behavior rating", "nonpharmacological", and "systematic review". Google Scholar was searched with equivalent phrases using quotation marks and Boolean combinations; because of result volume and ranking instability, the first 200 results for each focused query were screened by relevance. Search outputs were consolidated and duplicates were removed before eligibility screening. The original search log preserved the combined post-consolidation total (96 unique records) but did not preserve reliable source-specific pre-deduplication counts; these counts are therefore not retrospectively reconstructed. No language restriction was applied at the search stage, but only publications with an English-language title and abstract sufficient for eligibility assessment were retained. Reference lists of key reviews and guidelines were checked for seminal sources.

Eligibility criteria:

Formal synthesis included publications concerning children or adolescents receiving dental care and reporting at least one of the following: observed behavior/cooperation, dental fear or anxiety, pain associated with a nonpharmacological behavior-guidance intervention, physiological anxiety indicators, or comparative outcomes of nonpharmacological behavior-guidance techniques. Studies were excluded when the population extended predominantly beyond childhood/adolescence without separable pediatric data, when the population consisted primarily of children with special health care needs, when the intervention of interest was pharmacological sedation or general anesthesia, or when the publication did not contribute directly to the prespecified assessment or nonpharmacological-guidance domains. Professional guidance, seminal pre-2000 sources, and nonpediatric publications used to clarify terminology or construct boundaries were retained only as contextual sources and were not counted in the formal evidence set.

Study selection:

Ninety-six unique potentially relevant records were retained after search consolidation and duplicate removal. Title and abstract screening excluded 52 records because they did not meet the population, intervention/exposure, or outcome scope, leaving 44 articles for full-text assessment. Nineteen full-text articles were excluded from the formal synthesis: four were adult-focused, three concerned special health care needs without separable data for typically developing children, four centered on pharmacological management, and eight did not contribute directly to the prespecified assessment or nonpharmacological-guidance domains. Twenty-five publications were therefore retained for the formal narrative synthesis. Three additional references were retained outside the formal synthesis solely for contextual purposes: current professional guidance, a seminal pre-2000 pediatric source, and an adult source used to clarify construct boundaries. The manuscript therefore cites 28 references in total, while the formal evidence set contains 25 publications. The 2026 update informed interpretation of current high-level evidence and guidance without changing this numerically reconciled distinction between formal and contextual evidence.

Data extraction, methodological consideration, and synthesis. One reviewer extracted publication year, design, age range, sample characteristics, assessment instrument, intervention/comparator, primary outcomes, and principal findings. Evidence was grouped by function and design: systematic reviews and meta-analyses were used primarily to characterize the consistency, heterogeneity, and comparative direction of the broader evidence base; randomized clinical trials informed intervention-specific effects under defined conditions; observational studies informed associations and predictors of behavior or anxiety without being interpreted causally; and professional guidance was used to frame current terminology, indications, safeguards, and clinical application rather than as primary effectiveness evidence. Because the included publications differed substantially in design and outcome measurement, findings were synthesized narratively. Methodological quality was considered qualitatively through study design, sample size, comparator adequacy, clarity and validity of outcome measurement, and distinction among anxiety, pain, physiological indicators, and observed cooperation. No formal risk-of-bias tool or certainty-grading framework was applied; this limitation was taken into account by weighting conclusions more heavily toward systematic reviews, meta-analyses, randomized trials, and current professional guidance than toward small observational studies.

Terminology:

The term behavior guidance is used for contemporary clinical recommendations. Protective stabilization is not described as routine "force" or as a nonpharmacological intervention included in this review. Under current AAPD guidance it is an advanced behavior-guidance option requiring specific indications, consent/assent considerations, monitoring, documentation, and individualized risk-benefit assessment [5].

Study-selection flow:

Table 1.

Results.

The formally synthesized literature covered three overlapping domains: predictors and observable manifestations of cooperation; instruments for behavioral or anxiety assessment; and nonpharmacological behavior-guidance interventions. The evidence types served different interpretive purposes. Observational studies described associations between child, family, and treatment factors and observed behavior; randomized trials evaluated intervention-specific changes in anxiety, pain, physiological measures, or cooperation; systematic reviews and meta-analyses summarized broader comparative patterns and heterogeneity. Across these domains, age and baseline anxiety repeatedly emerged as clinically important modifiers. Younger age was commonly associated with more negative observed behavior and greater difficulty with self-report, while higher dental anxiety was associated with a greater likelihood of negative behavior during treatment. These observational relationships should not be interpreted as proof that age, family factors, or anxiety independently cause uncooperative behavior. Family factors, parental anxiety, temperament, previous dental experiences, and procedure-related pain were also associated with observed cooperation [2,12,13].

Shinohara and colleagues described fidgeting, covering the mouth, soft crying, holding onto the dentist, and shutting the eyes among behaviors associated with potentially uncooperative responses. Allen et al. identified age as an important predictor of disruptive behavior during restorative care, with parenting and limit-setting variables contributing additional predictive information. Mittal and Sharma reported that 23.83% of surveyed children expressed fear before a dental visit. Gopalasamy et al. reported an association between dental anxiety and negative behavior during treatment [2,12-15]. Because these findings arise largely from observational or predictive designs, they indicate relationships and predictive patterns rather than establishing causal effects.

Behavioral and dental-anxiety assessment tools:

The principal assessment tools differ in construct, administration, developmental demands, and clinical purpose. Direct observational scales quantify visible cooperation or behavior during treatment; they do not directly measure the child's internal anxiety state and may be influenced by pain, temperament, developmental immaturity, or situational resistance. Self-report and pictorial instruments more directly target perceived dental fear or anxiety but require sufficient comprehension and communication ability. Physiological indicators provide objective autonomic information but are nonspecific because pain, movement, excitement, and procedural stimulation can produce similar changes. Contemporary reviews therefore support selecting a tool according to the child's developmental level and the construct being assessed rather than treating observed behavior, anxiety, pain, and physiological arousal as interchangeable outcomes (Table 2) [6,7,16].

Nonpharmacological behavior guidance included traditional communication-based methods and newer distraction or sensory approaches. Tell-show-do and related communication techniques remain foundational because they structure expectations and provide gradual familiarization. Intervention outcomes must nevertheless be interpreted by construct. A reduction in self-reported anxiety is not equivalent to improved observed cooperation; lower pain during injection does not necessarily demonstrate lower anticipatory anxiety; and a change in pulse rate is a physiological response rather than a direct behavioral outcome. Distraction interventions, including audiovisual distraction and virtual reality, can improve selected outcomes, but the magnitude and consistency of benefit depend on the comparator, procedure, developmental level, and outcome instrument [10,11,17,18].

Recent higher-level evidence illustrates this variability. A 2024 systematic review and meta-analysis including 66 articles found that distraction often reduced self-rated anxiety, improved cooperation, or lowered pulse rate compared with tell-show-do outside more invasive procedures, while results for virtual reality, modelling, visual pedagogies, tell-show-do, and other interventions were inconsistent across studies [8]. These endpoints should be interpreted separately because they represent subjective anxiety, observed behavior, and physiological arousal. A 2024 network meta-analysis of 61 studies and 6,113 participants ranked music highly for dental-anxiety outcomes and hypnosis for heart-rate outcomes, but the authors emphasized the limited evidence base for some comparisons [11]. A 2025 systematic review and narrative synthesis of 18 randomized trials reported promising effects for several behavior-guidance approaches while also identifying variability in applicability and comparative certainty [19].

Individual trials are consistent with the conclusion that context matters. Felemban et al. reported favorable effects of virtual-reality distraction during infiltration anesthesia on selected

Table 1. *Numerically reconciled study-selection pathway for the formal evidence set. Of 96 unique records, 44 underwent full-text assessment and 25 were retained in the formal narrative synthesis. Three additional references were used only for contextual interpretation and were not counted in the formal study flow.*

Stage	Number	Disposition
Records retained after search consolidation	96	Entered title/abstract screening
Excluded at title/abstract screening	52	Outside population, intervention/exposure, or outcome scope
Full-text articles assessed	44	Assessed against eligibility criteria
Full-text exclusions	19	Adult-focused n=4; special health care needs without separable data n=3; pharmacological management n=4; outside prespecified assessment/guidance domains n=8
Studies in formal narrative synthesis	25	Included in formal evidence synthesis; 3 additional references retained only for contextual interpretation

Table 2. *Comparative clinical characteristics of commonly used behavioral and dental-anxiety assessment approaches [7, 14, 25].*

Tool / approach	Typical applicability	Scoring / construct	Clinical strengths	Important limitations
Frankl Behavior Rating Scale	Broad pediatric use; clinician observation	Four categories: definitely negative to definitely positive behavior	Very rapid; familiar; useful for chairside documentation and cooperation	Ordinal and observer-dependent; measures behavior rather than anxiety itself
Facial Image Scale (FIS)	Young school-age children able to choose facial representations	Five facial images representing increasing anxiety	Simple, visual, minimal reading demand	Limited granularity; cultural/facial preference may influence choice
Venham Picture Test (VPT)	Children able to make repeated pictorial choices	Pairs of anxious/non-anxious figures	Child-centered and pictorial	Longer than a single-item scale; depends on comprehension
RMS pictorial scale	Pediatric self-report	Pictorial emotional/anxiety response	Pragmatic and child-friendly	Less universally used; cross-cultural validation may be limited
Questionnaire-based scales	Older children with adequate language/cognitive skills	Multi-item self-report	Captures subjective and anticipatory anxiety	Less suitable for preschool children; language/reading ability affects validity
Physiological measures	Any age when equipment permits	Autonomic response	Objective adjunct	Nonspecific; affected by pain, movement, excitement and procedure

Table 3. *Representative evidence with comparators, outcomes, principal findings, and conclusions. The table facilitates comparison but does not imply quantitative equivalence among heterogeneous studies.*

Study	Design / participants	Intervention / comparator	Primary outcome(s)	Key finding / conclusion
Allen et al., 2003 [12]	Predictive observational study	Child/parent predictors; observed behavior	Disruptive behavior	Age was a major predictor; parenting/limit-setting contributed.
Mittal & Sharma, 2012 [13]	Cross-sectional pediatric study	Age-related response	Fear and behavior	23.83% reported fear before dental visit.
Felemban et al., 2021 [17]	Randomized clinical trial	VR distraction vs conventional approach	Pain and anxiety	VR improved selected outcomes; subgroup response differed.
Gizani et al., 2022 [10]	Systematic review/meta-analysis; 62 studies	Basic techniques	Anxiety, fear, behavior	Acceptable effectiveness overall; heterogeneity limited comparisons.
Kohli et al., 2022 [3]	Systematic review/meta-analysis	Psychological techniques	Dental fear/anxiety	Benefits in selected settings; evidence varied by technique and quality.
Dhar et al., 2023 [9]	Systematic review/meta-analysis; 40 articles	Nonpharmacological guidance	Anxiety, fear, pain, cooperation	Support varied by outcome and comparison.
Abdalhai et al., 2024 [21]	Randomized controlled trial	Aromatherapy/music vs comparators	Dental anxiety	Sensory interventions reduced anxiety in the studied setting.
Almarzouq et al., 2024 [8]	Systematic review/meta-analysis; 66 articles	Multiple interventions	Anxiety, cooperation, pulse	Distraction showed benefits; many comparative findings were inconsistent.
Kong et al., 2024 [11]	Network meta-analysis; 61 studies; 6,113 participants	12 interventions	Anxiety and heart rate	Music ranked highest for anxiety; hypnosis for heart rate; limitations remained.
Dhaliwal et al., 2025 [19]	Systematic review/narrative synthesis; 18 RCTs	Multiple techniques	Dental anxiety	CBT/technology/sensory methods showed promise; certainty varied.
Barry et al., 2025 [6]	Review of assessment tools	15 subjective and 5 objective tools	Validity/reliability/usability	Tool selection should reflect developmental level and purpose.

pain and anxiety outcomes, with subgroup differences by sex. Khanapurkar et al. and Kim et al. also evaluated virtual reality during local anesthesia and reported favorable findings for selected anxiety or pain measures. Music and aromatherapy have been associated with reductions in dental fear or anxiety in randomized studies, while external cooling or vibration has reduced injection pain in selected trials [17,18,20-25]. These findings should not be generalized across constructs: an intervention that reduces procedural pain may indirectly improve the child's experience but does not, by itself, establish an equivalent reduction in anticipatory dental anxiety or an improvement in observed cooperation.

Comparative evidence from representative studies:

Table 3.

Discussion.

The evidence supports a sequential clinical logic: first identify the construct and the child's developmental capacity, then

select and reassess behavior guidance accordingly. Observed cooperation, dental anxiety, pain, and physiological arousal overlap clinically but are not interchangeable. A child may appear uncooperative because of fear, pain, developmental immaturity, sensory discomfort, prior negative experience, family influences, or a combination of these factors. Conversely, a child may report substantial anxiety while remaining outwardly cooperative. Reliance on a single behavior score, anxiety score, pain rating, or physiological measure without contextual interpretation can therefore oversimplify the clinical problem and lead to poorly targeted guidance.

The Frankl scale remains useful because it is fast, familiar, and directly linked to observed chairside behavior. Its principal limitation is conceptual: it categorizes cooperation rather than measuring the intensity of dental anxiety. Pictorial scales such as FIS, VPT, and RMS can complement observation when the child can understand the task. A systematic review comparing pediatric dental-anxiety scales found no statistically significant differences in several head-to-head comparisons among pictorial instruments, suggesting that practical considerations and developmental suitability may be as important as small psychometric differences [16]. More recent tool-focused evidence similarly emphasizes that subjective and objective instruments answer different questions and should be selected according to age, cognitive ability, language, setting, and intended outcome [6]. The practical implication is that assessment should be multimodal when clinically necessary rather than based on an assumption that one scale captures all dimensions of distress.

Age is among the most consistent clinical modifiers, but it should be treated as a developmental indicator rather than a deterministic explanation of behavior. Younger children may have less developed emotional vocabulary, reduced capacity for anticipatory reasoning, and more variable ability to comply with multistep instructions. This helps explain why direct observation and simple visual tools are often more feasible in preschool and early school-age groups, whereas questionnaire-based instruments become more useful as language and cognitive skills develop. Within the same age group, however, temperament, previous dental experience, parental anxiety, current pain, treatment invasiveness, communication ability, and family expectations may substantially modify the child's response [1,26-28]. These factors should therefore be assessed jointly before a guidance strategy is selected.

The intervention evidence is strongest for the broader proposition that individualized nonpharmacological guidance can improve selected outcomes, not for the claim that one method is consistently superior. Communication-based methods remain clinically central because they are low-resource, adaptable, and compatible with family-centered care. Distraction, music, virtual reality, modelling, relaxation, and sensory approaches can be valuable adjuncts. However, recent syntheses demonstrate substantial heterogeneity in age groups, dental procedures, implementation protocols, comparators, and outcome instruments [8-11]. Interpretation should remain outcome-specific: a reduction in heart rate cannot automatically be equated with a clinically meaningful improvement in cooperation, and an intervention that reduces injection pain may not reduce anticipatory dental anxiety to the same degree. The clinical decision should therefore integrate developmental assessment, observed behavior, the child's self-reported anxiety when developmentally feasible, pain status, previous experience, and relevant family factors.

Virtual reality illustrates the need for cautious interpretation. Several individual trials report favorable effects, yet recent meta-analytic evidence does not consistently demonstrate superiority over established approaches for anxiety or pain. Music has produced favorable rankings in network meta-analysis and positive findings in randomized trials, but intervention content, duration, patient preference, and procedure type vary substantially. Technology should therefore be treated as an adjunct selected for a particular child rather than as a replacement for communication, trust-building, pain control, and developmentally appropriate preparation [8,11,17,18,20-22].

Current professional terminology also requires precision. Contemporary AAPD guidance frames behavior guidance as a continuum from basic to advanced options. Protective stabilization is an advanced technique with explicit indications, contraindications, precautions, consent/assent considerations, monitoring, and documentation requirements. It should not be described simply as force and should not be grouped with routine distraction or communication techniques. Sedation and general anesthesia are likewise outside the formal scope of this review because the review question concerns nonpharmacological guidance in typically developing children [5].

For clinical practice, the findings favor a pragmatic assessment-guidance-reassessment algorithm. Before selecting a technique, the dentist should establish the child's developmental and communication level, previous dental experience, current pain, baseline anxiety when measurable, observable cooperation, relevant temperament or sensory characteristics, and family factors such as parental anxiety and expectations. A brief observed behavior rating can document cooperation, while a developmentally appropriate pictorial or questionnaire-based instrument can be added when the clinical question concerns subjective anxiety. The initial plan should generally begin with communication-based strategies and may add distraction, modelling, audiovisual or virtual-reality methods, music, relaxation, or other sensory approaches according to the child's preferences, treatment demands, and previous response. The child's behavior, anxiety, pain, and tolerance should then be reassessed during the visit because response to guidance is dynamic. If the selected strategy does not achieve the intended outcome, the plan should be modified rather than assuming that a single technique is universally appropriate. This iterative linkage between assessment, individualized selection, and reassessment is central to clinically meaningful behavior guidance [5].

Evidence gaps remain important. Many primary studies are single-center trials with modest sample sizes; intervention protocols are not standardized; comparator conditions differ; and the same label, such as distraction or virtual reality, can represent substantially different exposures. Outcome measures also vary between self-reported anxiety, observer-rated behavior, pain scales, pulse rate, and other physiological indicators. These differences limit direct comparison and explain why

recent systematic reviews can reach different conclusions about the relative ranking of techniques [8-11]. Future trials should prespecify primary outcomes, explicitly distinguish anxiety, pain, cooperation, and physiological endpoints, use validated age-appropriate instruments, report clinically interpretable effect sizes, and stratify or adjust for age, baseline anxiety, previous dental experience, procedure type, family factors, and analgesic/pain-control variables. Observational studies should report associations without causal wording unless the design supports causal inference.

Limitations.

This review has several limitations. First, only PubMed and Google Scholar were used in the original search framework; databases such as Embase, Scopus, PsycINFO, Web of Science, and the Cochrane Library were not systematically searched. Google Scholar ranking is dynamic and less reproducible than bibliographic database indexing, although focused queries and a predefined screening depth were used to improve transparency. In addition, the original search log preserved the combined number of unique records after consolidation but not reliable database-specific pre-deduplication counts. Those counts could not be reconstructed without risking inaccurate reporting, and this limits full reproducibility of the source-level search flow.

Second, the review intentionally used a structured narrative design rather than a systematic-review design. Screening and extraction were performed by one reviewer; formal duplicate independent screening, protocol registration, study-level risk-of-bias scoring, certainty-of-evidence grading, and quantitative meta-analysis were not performed. Methodological quality was therefore considered qualitatively through design, sample size, comparator adequacy, outcome measurement, and construct clarity. Conclusions were weighted toward higher-level evidence and randomized trials, but this qualitative hierarchy does not substitute for a formal risk-of-bias or certainty assessment.

Third, substantial clinical and methodological heterogeneity exists across the evidence base. Studies differ in age, dental procedure, intervention intensity, comparator, cultural setting, anxiety instrument, behavior scale, pain assessment, physiological outcome, and follow-up period. These differences limit claims of comparative superiority and require caution when translating statistically favorable findings into clinical recommendations. Finally, children with special health care needs and pharmacological behavior guidance were excluded from the formal synthesis, and contextual sources were kept analytically separate from the 25-publication formal evidence set; the conclusions should therefore not be generalized to excluded populations or treatment pathways.

Conclusion.

Assessment of children in pediatric dentistry should distinguish observable cooperation from dental fear and anxiety, procedural pain, and physiological arousal. The Frankl Behavior Rating Scale remains a practical chairside tool for observed behavior, while pictorial and questionnaire-based measures can add clinically relevant information when matched to the child's developmental and communication capacity. Age is an important modifier of behavior but should be interpreted together with temperament, previous dental experience, pain, baseline anxiety, and family factors. Current evidence supports individualized nonpharmacological behavior guidance, with communication-based techniques as a foundation and distraction, music, audiovisual or virtual-reality methods, modelling, relaxation, and sensory approaches used selectively. The comparative evidence remains heterogeneous, and no single intervention can be considered universally superior. Clinical management should therefore follow an iterative process of developmental assessment, construct-specific measurement, individualized technique selection, and reassessment of the child's response, within a patient-specific and family-centered framework consistent with current professional guidance.

REFERENCES

1. Abbas B, Irfan Qureshi A, Waseem M, et al. Effect of parental dental anxiety level on acceptance of non-pharmacological behavior management strategies used in pediatric dentistry. European Journal of Dental and Oral Health. 2023;4.
2. Gopalasamy K, Gurunathan D, Kanthaswamy AC, et al. Dental fear and their effect on their behaviour during the dental treatment among children. International Journal of Pharmaceutical Research. 2020;12.
3. Kohli N, Hugar S, Soneta S, et al. Psychological behavior management techniques to alleviate dental fear and anxiety in 4-14-year-old children in pediatric dentistry: a systematic review and meta-analysis. Dental Research Journal. 2022;19.
4. Malka A, Maya G. Pain-related disruptive behavior during dental treatment interpreted as uncooperative behavior-small case series. International Journal of Clinical Pediatric Dentistry. 2019;12.
5. American Academy of Pediatric Dentistry. Behavior guidance for the pediatric dental patient. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2025:379-399.
6. Barry M, Alnami M, Alshobaili YT, et al. Assessment of dental fear and anxiety tools for children: a review. Healthcare (Basel). 2025;13:2597.
7. Narayan VK, Samuel SR. Appropriateness of various behavior rating scales used in pediatric dentistry: a review. Journal of Global Oral Health. 2020;2.
8. Almarzouq SSFS, Chua H, Yiu CKY, et al. Effectiveness of nonpharmacological behavioural interventions in managing dental fear and anxiety among children: a systematic review and meta-analysis. Healthcare (Basel). 2024;12:537.
9. Dhar V, Jayaraman J, Marghalani AA, et al. Nonpharmacological behavior guidance for children during dental treatment visits: a systematic review and meta-analysis-Part 2. Pediatric Dentistry. 2023;45:197-220.
10. Gizani S, Seremidi K, Katsouli K, et al. Basic behavioral management techniques in pediatric dentistry: a systematic review and meta-analysis. Journal of Dentistry. 2022;126:104303.
11. Kong X, Song N, Chen L, et al. Non-pharmacological interventions for reducing dental anxiety in pediatric dentistry: a network meta-analysis. BMC Oral Health. 2024;24:1151.
12. Allen KD, Hutfless S, Larzelere R. Evaluation of two predictors of child disruptive behavior during restorative dental treatment. Journal of Dentistry for Children. 2003;70.

13. Mittal R, Sharma M. Assessment of psychological effects of dental treatment on children. Contemporary Clinical Dentistry. 2012;3.
14. Shinohara S, Nomura Y, Ide M, et al. The classification of the children by their behavior for the dental treatment using cluster analysis. Pediatric Dental Journal. 2005;15.
15. Shinohara S, Nomura Y, Shingyouchi K, et al. Structural relationship of child behavior and its evaluation during dental treatment. Journal of Oral Science. 2005;47.
16. Jaiswal N. Dental anxiety scales used in pediatric dentistry: a systematic review and meta-analysis. International Journal of Clinical Pediatric Dentistry. 2022.
17. Felemban OM, Alshamrani RM, Aljeddawi DH, et al. Effect of virtual reality distraction on pain and anxiety during infiltration anesthesia in pediatric patients: a randomized clinical trial. BMC Oral Health. 2021;21.
18. Kim D, Lee S, Lee N, et al. Effect of virtual reality distraction on pain and anxiety in children during local anesthesia. Journal of the Korean Academy of Pediatric Dentistry. 2021;48.
19. Dhaliwal JK. A systematic review and narrative synthesis of evidence from randomised controlled trials: the impact of behaviour guidance techniques on dental anxiety in paediatric patients. BMC Oral Health. 2025.
20. Khanapurkar PM, Nagpal D, Lamba G, et al. Effect of virtual reality distraction on pain and anxiety during local anesthesia injection in children: a randomized controlled cross-over clinical study. J Adv Med Dent Scie Res. 2020;6.
21. 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.
22. Janthasila N, Keeratisiroj O. Music therapy and aromatherapy on dental anxiety and fear: a randomized controlled trial. Journal of Dental Sciences. 2023;18.
23. Kassem El Hajj H, Fares Y, Abou-Abbas L. Assessment of dental anxiety and dental phobia among adults in Lebanon. BMC Oral Health. 2021;21.
24. Bilsin E, Güngörmüş Z, Güngörmüş M. The efficacy of external cooling and vibration on decreasing the pain of local anesthesia injections during dental treatment in children: a randomized controlled study. Journal of Perianesthesia Nursing. 2020;35.
25. Nanitsos E, Vartuli R, Forte A, et al. The effect of vibration on pain during local anaesthesia injections. Australian Dental Journal. 2009;54:94-100.
26. Bajrić E, Kobašlija S, Huseinbegović A, et al. Factors that determine child behavior during dental treatment. Balkan Journal of Dental Medicine. 2016;20.
27. Kol Doğan Ş, Çelenk S. Parental dental anxiety levels in pediatric dentistry. Conservative Dentistry Journal. 2023;13:51-55.
28. Radis FG, Wilson S, Griffen AL, et al. Temperament as a predictor of behavior during initial dental examination in children. Pediatric Dentistry. 1994;16.

РЕЗЮМЕ.

Цель исследования: обобщить клинически значимые данные об оценке поведения и стоматологической тревожности у детей, а также о нефармакологических методах управления поведением в детской стоматологии. **Материал и методы:** выполнен структурированный нарративный обзор с использованием PubMed и Google Scholar. В формальный анализ включены 25 публикаций, отобранных из 96 уникальных записей после объединения результатов поиска. Еще три источника использовались только для контекстуальной интерпретации и не входили в формальный синтез; таким образом, общий список литературы включает 28 источников.

Результаты: возраст, исходная тревожность, темперамент, предыдущий стоматологический опыт и семейные факторы ассоциировались с сотрудничеством ребенка. Шкала Франкла остается практичным инструментом наблюдения за поведением, тогда как графические шкалы самооценки полезны у детей соответствующего уровня развития. Нефармакологические методы, включая отвлечение, музыку, аудиовизуальные и виртуальные технологии, моделирование и сенсорные подходы, могут снижать тревожность или боль, однако сравнительная эффективность неоднородна.

Выводы: оценка поведения и тревожности должна соответствовать возрасту и развитию ребенка и сочетаться с индивидуализированным, семейно-ориентированным подходом и повторной оценкой реакции ребенка.

Ключевые слова: детская стоматология, стоматологическая тревожность, поведение ребенка, управление поведением, шкала Франкла, нефармакологические методы.

რეზიუმე.

კვლევის მიზანი: ბავშვთა სტომატოლოგიაში ქცევისა და სტომატოლოგიური შფოთვის შეფასების, აგრეთვე ქცევის მართვის არაფარმაკოლოგიური მეთოდების შესახებ კლინიკურად მნიშვნელოვანი მტკიცებულებების შეჯამება. მასალა და მეთოდები: ჩატარდა სტრუქტურირებული ნარატიული მიმოხილვა PubMed-ისა და Google Scholar-ის გამოყენებით. ძიების შედეგების გაერთიანების შემდეგ მიღებული 96 უნიკალური ჩანაწერიდან ფორმალურ სინთეზში შევიდა 25 შესაბამისი პუბლიკაცია. დამატებით სამი წყარო გამოყენებულ იქნა მხოლოდ კონტექსტური ინტერპრეტაციისთვის და ფორმალურ სინთეზში არ შესულა, რის შედეგადაც ბიბლიოგრაფია სულ 28 წყაროს მოიცავს. შედეგები: ასაკი, საწყისი შფოთვა, ტემპერამენტი, წინა სტომატოლოგიური გამოცდილება და ოჯახური ფაქტორები განმეორებით იყო დაკავშირებული ბავშვის თანამშრომლობასთან. ფრანკლის ქცევის შეფასების სკალა კვლავ პრაქტიკული კლინიკური ინსტრუმენტია, ხოლო შესაბამისი განვითარების მქონე ბავშვებში სასარგებლოა ვიზუალური თვითშეფასების სკალებიც. ყურადღების გადატანა, მუსიკა, აუდიოვიზუალური და ვირტუალური რეალობის საშუალებები, მოდელირება და სხვა სენსორული მიდგომები ცალკეულ პირობებში ამცირებს შფოთვას ან ტკივილს, თუმცა მათი შედარებითი ეფექტიანობა არაერთგვაროვანია.

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