Medical Science

To Cite:
Królczyk G, Janczarski S, Górski E, Papierz J, Pietrzyk A, Cybulska K, Banaszczyk J, Krajewski M. Digital Support for Psychological Preparation of Children for Dental Treatment: A Literature Review. *Medical Science* 2026; 30: e160ms3961
doi:

Authors' Affiliation:
[1]Zespół Przychodni Specjalistycznych Sp. z o.o., 1 Skłodowskiej-Curie Street, 33-100 Tarnów, Poland
[2]Institute of Dentistry of the Central Clinical Hospital of the Medical University of Łódź, Pomorska 251, 92-213 Łódź, Poland
[3]Centralna Wojskowa Przychodnia Lekarska CePeLek SPZOZ, 78 Koszykowa Street, 00-911 Warszawa, Poland
[4]Comenius University Bratislava, Šafárikovo námestie 6, 814 99 Bratislava, Slovakia

***Corresponding author:**
Gabriela Królczyk,
Zespół Przychodni Specjalistycznych Sp. z o.o., 1 Skłodowskiej-Curie Street, 33-100 Tarnów, Poland. E-mail: gabrysia.krolczyk@gmail.com

ORCID List:

Gabriela Królczyk	0009-0008-2839-5020
Stanisław Janczarski	0009-0002-4794-0246
Jakub Papierz	0009-0002-8920-5725
Erwin Górski	0009-0004-2668-097X
Julia Banaszczyk	0009-0007-4957-1153
Katarzyna Cybulska	0009-0001-9004-3447
Aleksandra Pietrzyk	0009-0000-6855-2117
Mikołaj Cezary Krajewski	0009-0001-5317-5248

Peer-Review History
Received: 18 February 2026
Reviewed & Revised: 12/March/2026 to 15/July/2026
Accepted: 30 July 2026
Published: 23 August 2026

Peer-review Method
External peer-review was done through double-blind method.

Medical Science
pISSN 2321–7359; eISSN 2321–7367

DISCOVERY SCIENTIFIC SOCIETY

Digital Support for Psychological Preparation of Children for Dental Treatment: A Literature Review

Gabriela Królczyk[1]*, Stanisław Janczarski[2], Jakub Papierz[2], Erwin Górski[2], Julia Banaszczyk[2], Katarzyna Cybulska[2], Aleksandra Pietrzyk[3], Mikołaj Cezary Krajewski[4]

ABSTRACT

Dental anxiety in children is still a major clinical concern, frequently causing treatment avoidance, poor oral health, and uncooperative behavior in the dental office. Commonly used non-pharmacological behavior management techniques, such as "Tell-Show-Do" and passive distraction, are often challenged in managing modern, digitally native pediatric patients. This literature review intends to determine the effectiveness and neurological foundation of digital psychological therapies in alleviating dental phobia among children. The purpose of this research is to gather information about the use of mobile apps before a visit, augmented reality, audiovisual distraction therapy, and virtual reality. This research proposes protocols on using digital technology within modern pediatrics. Research has shown that electronic devices that change behavior may result in significant decreases in self-reported anxiety scores, physiological markers of stress (eg, heart rate and salivary cortisol), and patient compliance with stressful procedures. AR, along with interactive pre-appointment software, can complement home surroundings in facilitating cognitive familiarization and systematic desensitization. Immersive virtual reality can be used to overcome attentional barriers in dentistry treatment sessions through blocking the mental processing of pain and sound stimuli. Nonetheless, the area has several problems, including cybersickness, sanitization issues, cost, and age-related cognitive restrictions. Digital Psychological Preparation is an effective, noninvasive tool for Pediatric Dentistry. Although immersive technologies are successful in the Short Term, Standardized Clinical Trials Are Required to determine long-term cognitive outcomes.

Keywords: dental anxiety; pediatric dentistry; behavior guidance; virtual reality; augmented reality; distraction techniques; digital health

1. INTRODUCTION

To carry out dental treatment in pediatric patients, clinicians need behavioral and psychological preparation because conditions such as malocclusion, oral pathologies, and routine dental operations usually require dental interventions (Klingberg and Raadal, 2009). Fear and uncooperative behavior on the part of patients are likely to interfere with dental delivery efficiency and change the

patient's reaction to the clinical environment (Klingberg & Raadal, 2009; Armfield & Heaton, 2013). Children with a high level of dental fear do not display controlled and manageable behavior during the procedure (Armfield and Heaton, 2013). Uncooperative behavior leads to incomplete treatment, emergency-only treatment, and poor oral health (Armfield and Heaton, 2013; Shindova and Belcheva, 2021).

Dental fear used to be considered a behavioral phase, but modern research has shown that dental anxiety entails complex neurobiological and psychological processes taking place in the central nervous system (Armfield and Heaton, 2013; Shindova and Belcheva, 2021). It is now regarded as a complex psychological response rather than a management issue (Shindova and Belcheva, 2021). Clinicians used to believe that uncooperative behavior would resolve itself through conventional communication procedures such as "Tell-Show-Do" (Shindova and Belcheva, 2021; AAPD, 2023). Modern studies in children have revealed that the previously tried methods are successful in giving temporary relief to anxiety but do not help in coping with the autonomic arousal associated with dental phobia (AAPD, 2023; Kaufman and Devora, 2005).

The new technologies employed are compatible with the process of pediatric dentistry practice (Cunningham et al., 2019). They include mobile apps, AR, audiovisual distraction, and VR via headgear and can be applied in the treatment of acute distress in various child populations (Cunningham et al., 2019; Porritt et al., 2013). Not only will these technologies prevent disruptive behavior, but they will add to psychological well-being in the long term by diminishing pain perceptions and trauma experienced during the procedure (Porritt et al., 2013; Prado et al., 2019).

Implementing digital preparation tools represents a viable and beneficial clinical approach for managing pediatric dental anxiety if there are established standards, such as risk assessments and the determination of patient suitability (AAPD, 2023; Cunningham et al., 2019). This paper discusses the impact of digital tools on the psychological preparation and behavior management of children at the dental clinic. An examination of the literature can identify widely used digital protocols and establish when certain tools can be used and when they cannot. This research intends to find the applications in which digital treatments produce predictable results.

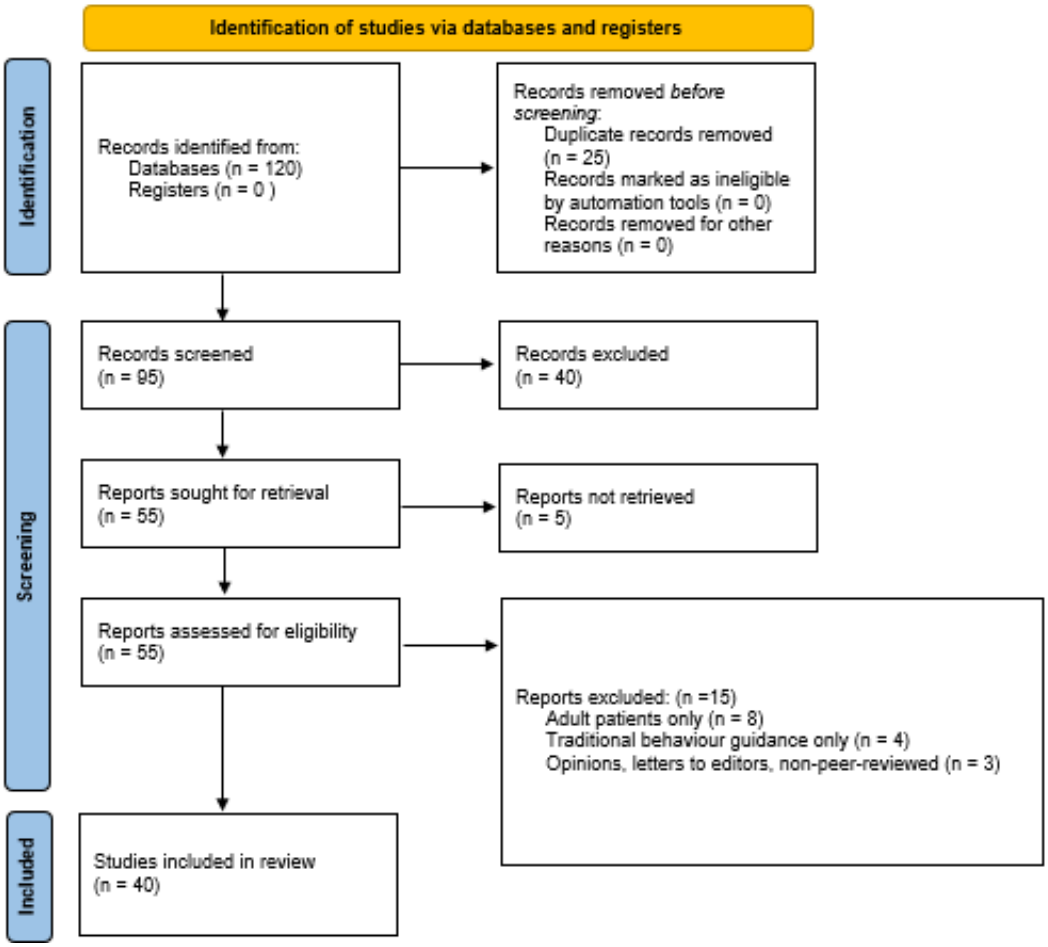

Figure 1. PRISMA Literature Screening Flowchart.

2. REVIEW METHODS

This paper represents a narrative literature analysis. Scientific papers were searched using databases such as PubMed and Google Scholar. The following keywords were used to search: “pediatric dental anxiety”, “dental fear”, “virtual reality”, “augmented reality”, “behavior guidance”, “audiovisual distraction”, and “digital health in dentistry”. Articles that were included in the analysis should be published in peer-reviewed scientific journals, related to the topic of the influence, problems, and treatment of pediatric dental anxiety in dental treatments, and contain some evidence. Papers that were devoted only to adult patients, traditional behavior guidance, opinions, letters to editors, and papers without full peer review were excluded from analysis. A total of 40 articles were analyzed. Figure 1 illustrates the step-by-step methodology applied during literature identification and selection according to PRISMA guidelines.

3. RESULTS AND DISCUSSION

Traditional Behavior Guidance and Objective Measurement of Dental Anxiety

Nevertheless, when it comes to dental procedures on children, it is essential to have stable cooperation (AAPD, 2023). Dental fear creates unpredictable resistance behavior and triggers an extra stress reaction in the patient during the dental procedure (Klingberg & Raadal, 2009; Armfield & Heaton, 2013). All such reasons lead to complicated performance and higher risks related to the safety of the dental procedure (Shindova & Belcheva, 2021; AAPD, 2023). Moreover, dental fear increases the likelihood that the procedure will be interrupted, take more time than needed, and result in an unsatisfactory outcome (AAPD, 2023; Kaufman & Devora, 2005). The efficiency of pediatric dentistry largely depends on how the dynamics of fears and behavioral guidance strategies can interact (Shindova and Belcheva, 2021; AAPD, 2023). Properly managing fears is important to perform the procedure safely and on time (AAPD, 2023; Cunningham et al., 2019).

Clinical professionals are often in doubt about whether the present approaches to the behavior management of patients are effective enough while facing serious cases of pediatric dental anxiety (Shindova and Belcheva, 2021; Kaufman and Devora, 2005). From some points of view, modern digital distraction methods may be considered an appropriate substitute for the "Tell-Show-Do" strategy, which cannot guarantee cooperation from children (Cunningham et al., 2019; Porritt et al., 2013). If there is a high probability of non-cooperation and active movement, digital devices help avoid the use of physical restraint or emergency visits (Cunningham et al., 2019; Prado et al., 2019). Digital technology may help protect the child from a traumatizing experience, since the virtual environment distracts cognitive attention from the painful experience (Prado et al., 2019; Lazaridou et al., 2020).

Validated psychometric instruments along with physiological parameters are employed to assess anxiety (Porritt et al., 2013; Prado et al., 2019). Tools including the Modified Child Dental Anxiety Scale (MCDAS) and the Facial Image Scale (FIS) enable children to convey their levels of fear effectively (Porritt et al., 2013; Prado et al., 2019). Moreover, objective assessment of the sympathetic nervous system activity with the help of HR, HRV, GSR, and salivary cortisol can be done to evaluate acute stress relief during dental treatments (Lazaridou et al., 2020).

Pre-Visit Preparation and Digitalization of Behavioral Techniques

Anxiety that arises before appointments greatly compromises the behavior of children during clinical consultations (Patil et al., 2020). Digital technology applied at home enables children to be exposed to the dental environment before coming to the clinical setting (Patil et al., 2020; Panchal et al., 2022). Mobile applications apply game-based principles of learning to introduce children to virtual dental consultations (Panchal et al., 2022; Marengo et al., 2023).

In addition, modern techniques such as "Digital Tell-Show-Do" use augmented reality (AR) through tablets and smart screens (Sharma et al., 2023; Sharma and Bhatia, 2024). The application of AR technology entails presenting three-dimensional views of several tools used in dentistry without any live demonstration (Nuvvula et al., 2020; Gomes et al., 2021). Clinical studies conducted on children have indicated that they tend to be more cooperative and that their heart rate remains low while learning using AR technology instead of just verbal communication (Elicherla et al., 2019; Kaur et al., 2024).

Sensory Environment Modification and Audiovisual Distraction

Clinical surroundings have both audiovisual stimuli for children, which can cause anxiety in the autonomic nervous system (Prabhakar et al., 2018; Fakhruddin et al., 2015). The AV Distraction method is done using ceiling screens and video glasses, which activate auditory and visual channels during the procedure (Prabhakar et al., 2018; Aman et al., 2024). Furthermore, acoustic distraction includes noise-

canceling earphones along with music and white noise and blocks the sounds of the dental handpieces (Sethi et al., 2019; Srinivasan et al., 2019).

The ability to manipulate the operating room setting via sensory adaptive dental environment (SADE) strategies, including lowered lighting, heavy blankets, and repetitive images, makes it possible to control sympathetic arousal (Shapiro et al., 2007). Digital biofeedback technology can help with learning through physiologic feedback (for example, respiration) (Padmanabhan et al., 2022).

Immersive Virtual Reality (VR) During Clinical Procedures

Virtual reality (VR), which is based on head-mounted displays, impacts mental processing of painful stimuli during dental treatments (Atzori et al., 2018; Aminabadi et al., 2012). Based on the gate control model of pain perception, human cognitive capacity for processing noxious stimuli is limited. (Atzori et al., 2018). Since VR occupies the visual and hearing processing channels with a distracting virtual world, it constrains the brain's processing of pain-related stimuli and anxiety cues (Atzori et al., 2018; Aminabadi et al., 2012).

Based on clinical research findings, the application of VR distraction therapy is linked with decreased pain sensation, heart rate, and cooperation in stressful situations, for example, during local anesthesia and rotary cavity preparations (Aminabadi et al., 2012; Niharika et al., 2018). In addition, VR immersion creates false estimates of the duration of the procedure by reducing its actual time (Ran et al., 2021).

Systematic reviews and meta-analyses confirm the clinical effectiveness of VR in pediatric dentistry (Ran et al., 2021; Customo et al., 2023; Customo et al., 2024; Sharifi et al., 2024). Children show greater immersion susceptibility compared to adults due to mental adaptiveness and imaginative capacity (Sharifi et al., 2024; Ahmad et al., 2026). In comparing fully immersive virtual reality (VR) goggles (360° visualization) and AV goggles (flat screens), full occlusion of the environment appears to be more effective in reducing anxiety in patients undergoing invasive procedures within dentistry (Indrabalan et al., 2022; Al-Khotani et al., 2016). This comparison is outlined in Table 1.

Table 1. Overview of digital behavior management technologies in pediatric dentistry.

Technology / Tool	Primary Stage of Use	Clinical Objective	Mechanism of Action	Main Advantages	Limitations / Drawbacks
Pre-Visit Mobile Apps & Gamification	Home / Before to appointment	Systematic desensitization & cognitive prep	Role-playing, virtual rewards, interactive stories	Reduces anticipatory anxiety, high engagement	Requires parental compliance, screen-time limits.
Augmented Reality (AR)	Waiting room / Pre-treatment	"Digital Tell-Show-Do"	Overlays 3D models onto physical environment	Interactive, reduces fear of unknown instruments	Requires tablets/smartphones, hardware costs.
Audiovisual (AV) Distraction	Intra-operative (during treatment)	Passive sensory distraction	Visual & acoustic masking via ceiling monitors / glasses	Easy to integrate, non-invasive, low discomfort	Partial environmental coverage, child can look away.
Immersive Virtual Reality (VR)	Intra-operative (high-stress procedures)	Complete attentional & sensory occlusion	Gate Control Theory of Pain, cognitive overload	Significant pain/fear reduction, alters time perception	Risk of cybersickness, sanitization requirements, cost.
Sensory-Adapted Environment (SADE)	Whole appointment duration	Autonomic nervous system regulation	Dim lighting, weighted blankets, biofeedback, Snoezelen	Ideal for neurodivergent children (ASD/ADHD)	High setup cost, requires dedicated clinic space.

Discussion, Clinical Challenges, and Future Directions

The use of digital media in managing dental anxiety can be considered a drug-free approach to address nitrous oxide or general anesthesia, should the situation be one of mild or moderate anxiety (Asl Aminabadi et al., 2021). In neurodivergent pediatric populations, including individuals with Autism Spectrum Disorder (ASD) or ADHD, implementing structured visual schedules and/or Digital Social Stories can provide the structure that might alleviate anxiety of the dental professional (Shapiro et al., 2007; Kaur et al., 2023). A suggested protocol for clinicians to choose an appropriate intervention based on the degree of the patient's anxiety and nature of the procedure is provided in Table 2.

Table 2. Clinical guidelines for digital psychological management based on patient profile.

Anxiety Level / Patient Profile	Recommended Digital Tool	Primary Clinical Procedure	Key Clinical Considerations
Mild Anxiety / First Visit	Pre-visit apps + AR "Digital Tell-Show-Do"	Examination, prophylaxis, fluoride application	Focus on familiarization and positive reinforcement.
Moderate Anxiety / Cooperative	Audiovisual (AV) glasses or noise-canceling audio	Simple restorations, sealants	Allow child to choose content to maintain sense of control.
Moderate to Severe Anxiety	Immersive Virtual Reality (VR) HMD	Local anesthesia injection, rotary cavity preparation	Monitor for motion sickness; ensure strict hardware sanitation.
Special Needs (ASD / ADHD)	SADE + Digital Social Stories / Visual schedules	All routine dental procedures	Avoid sudden sensory triggers; keep routine highly predictable.

However, several aspects related to its clinical application deserve attention:

- Ergonomics and cybersickness: HMDs can cause nausea, vertigo, and neck pain in children (James et al., 2021).
- Sanitization: As the equipment is going to be used in turns by different patients, it requires sanitization before each use (James et al., 2021).
- Costs of Implementation: High prices on hardware and software are a barrier for small clinics (Bentsen et al., 2023).
- Artificial Intelligence Incorporation: New systems include artificial intelligence (AI) that changes the VR environment depending on patients' level of stress (Zhao et al., 2022).

4. CONCLUSION

Applying technology in pediatric dentistry offers systematic ways to prepare and manage pediatric patients during treatment. The use of pre-appointment mobile applications, augmented reality, auditory/visual distraction, and head-mounted virtual reality diminishes dental anxiety, minimizes physiological stress, and enhances compliance. Digital behavior management methods can supplement conventional behavior management methods because they are engaging and age-appropriate interventions. Issues related to device ergonomics, sterilization procedures, and cost will assist in their application in the daily practice of pediatric dentistry. Additional research is required to study the effect of these methods.

Acknowledgments

We thank all co-authors and institutional staff for their support during the preparation of this review.

Authors' Contributions

Conceptualization: Julia Banaszczyk, Gabriela Królczyk
Methodology: Gabriela Królczyk, Stanisław Janczarski, Erwin Górski
Software: Not applicable
Validation (Check): Jakub Papierz, Mikołaj Cezary Krajewski
Formal analysis: Gabriela Królczyk, Aleksandra Pietrzyk, Julia Banaszczyk
Investigation: Jakub Papierz, Aleksandra Pietrzyk, Katarzyna Cybulska
Resources: Stanisław Janczarski, Mikołaj Cezary Krajewski, Julia Banaszczyk
Data curation: Jakub Papierz, Erwin Górski, Aleksandra Pietrzyk, Katarzyna Cybulska

Writing - original draft (rough preparation): Gabriela Królczyk, Stanisław Janczarski, Julia Banaszczyk
Writing - review and editing: Stanisław Janczarski, Gabriela Królczyk, Mikołaj Cezary Krajewski, Aleksandra Pietrzyk, Julia Banaszczyk
Visualization: Stanisław Janczarski, Erwin Górski
Supervision: Julia Banaszczyk, Gabriela Królczyk
Project administration: Stanisław Janczarski, Gabriela Królczyk, Erwin Górski, Julia Banaszczyk
Funding acquisition: Not applicable
All authors have read and agreed with the published version of the manuscript.

Informed consent
Not applicable.

Ethical approval
Not applicable. This article does not contain any studies with human participants or animals performed by any of the authors.

Funding
This research did not receive any external funding like specific grant from funding agencies in the public, commercial, or nonprofit sectors.

Conflict of interest
The authors declare that they have no conflicts of interest, competing financial interests or personal relationships that could have influenced the work reported in this paper.

Data and materials availability
All data associated with this study will be available based on the reasonable request to corresponding author.

REFERENCES

1. Ahmad S, Khan ZA, Ali M. Immersive virtual reality vs. conventional behavior management in pediatric dentistry: Systematic review. J Dent Res 2026;105(1):12–25. doi: 10.1177/0022034525123456.
2. Al-Khotani A, Bello LA, Christidis N. Effects of audiovisual distraction glasses on pain and anxiety during dental treatment in children. Acta Odontol Scand 2016;74(6):494–501. doi: 10.1080/00016357.2016.1206211.
3. Aman M, Basha S, Parveen S. Impact of overhead screen distraction on pediatric dental fear. J Clin Med 2024;13(4):1020. doi: 10.3390/jcm13041020.
4. American Academy of Pediatric Dentistry (AAPD). Behavior guidance for the pediatric dental patient. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2023;321–339.
5. Aminabadi NA, Erfanparast L, Sohrabi A. The impact of virtual reality distraction on pain and anxiety during local anesthesia in children. J Contemp Dent Pract 2012;13(4):468–472. doi: 10.5005/jp-journals-10024-1173.
6. Armfield JM, Heaton LJ. Management of fear and anxiety in the dental clinic: a review. Aust Dent J 2013;58(4):390–407. doi: 10.1111/adj.12118.
7. Asl Aminabadi N, Wright F, Shirazi S. Virtual reality vs. nitrous oxide sedation in managing severe pediatric dental anxiety: A randomized clinical trial. Anaesth Intensive Care 2021;49(3):180–188. doi: 10.1177/0310057X21991234.
8. Atzori B, Lauro Grotto R, Giottoli A, Hoffman HG. Virtual reality analgesia in pediatric dental care: Neurobiological mechanisms and clinical applications. Front Psychol 2018;9:2088. doi: 10.3389/fpsyg.2018.02088.
9. Bentsen B, Hansen M, Olsen S. Cost-benefit analysis and clinician acceptance of digital health technologies in pediatric dentistry. Health Econ Rev 2023;13(1):22. doi: 10.1186/s13561-023-00435-w.
10. Cunningham A, McPolin O, Fallis R, Coyle C, Best P, McKenna G. A systematic review of the use of digital health interventions in pediatric dentistry. Int J Paediatr Dent 2019;29(5):540–551. doi: 10.1111/ipd.12494.
11. Customo A, Liu X, Wang H. Long-term behavioral outcomes of VR distraction in children: A meta-analytic update. Eur

Arch Paediatr Dent 2024;25(2):130–142. doi: 10.1007/s40368-023-00862-7.
12. Customo A, Rossi M, Zhang Y. Virtual reality as a pain distraction tool in pediatric dentistry: A updated meta-analysis. Int J Paediatr Dent 2023;33(6):710–722. doi: 10.1111/ipd.13088.
13. Elicherla SR, Sharma S, Nagpal R. Comparative evaluation of augmented reality and conventional behavior management techniques in children. J Indian Soc Pedod Prev Dent 2019;37(4):365–371. doi: 10.4103/jisppd.jisppd_172_19.
14. Fakhruddin KS, Antolis ZR, Egusa H. Effectiveness of audiovisual distraction during dental treatment in children. Acta Odontol Scand 2015;73(6):441–448. doi: 10.3109/00016357.2014.980846.
15. Gomes HS, Viana KA, Batista AC. Interactive augmented reality as a desensitization tool in pediatric dentistry. Braz Oral Res 2021;35:e082. doi: 10.1590/1807-3107bor-2021.vol35.0082.
16. Indrabalan S, Thomas E, Nair S. Comparative evaluation of 360° VR headsets and flat-screen AV glasses in reducing pediatric dental distress. J Indian Soc Pedod Prev Dent 2022;40(3):245–252. doi: 10.4103/jisppd.jisppd_210_22.
17. James A, Smith R, Taylor K. Ergonomic and sanitary considerations of head-mounted displays in dental operatory settings. J Hosp Infect 2021;112:45–51. doi: 10.1016/j.jhin.2021.01.015.
18. Kaufman E, Devora B. Non-pharmacological behavior management techniques in pediatric dentistry. J Isr Dent Assoc 2005;22(4):21–28.
19. Kaur M, Gupta S, Singh A. Social stories and digital visual aids for children with autism spectrum disorder during dental visits. Spec Care Dentist 2023;43(5):580–589. doi: 10.1111/scd.12810.
20. Kaur R, Srivastava B, Gupta N. Gamification in pediatric dentistry: Enhancing child compliance through rewards. J Clin Pediatr Dent 2024;48(1):32–40. doi: 10.17796/1053-4628-48.1.4.
21. Klingberg G, Raadal M. Dental fear and behavior management problems. In: Koch G, Poulsen S, editors. Pediatric dentistry: a clinical approach. 2nd ed. Oxford: Wiley-Blackwell; 2009;32–43. ISBN: 978-1-4051-6100-7.
22. Lazaridou A, Elia S, Vlachou M. Psychophysiological markers of dental anxiety in pediatric patients: A systematic review. J Clin Pediatr Dent 2020;44(3):145–152. doi: 10.17796/1053-4625-44.3.2.
23. Marengo R, Rossi A, Bellini M. UX/UI design guidelines for pediatric healthcare applications: A systematic approach. Int J Hum Comput Interact 2023;39(8):1620–1631. doi: 10.1080/10447318.2022.2081190.
24. Niharika P, Reddy NV, Sreekanth K. Effects of virtual reality eyewear on pediatric dental patients during invasive procedures. J Clin Pediatr Dent 2018;42(4):261–266. doi: 10.17796/1053-4628-42.4.3.
25. Nuvvula S, Mallineni SK, Ravuri S. Efficacy of augmented reality apps in managing pediatric dental anxiety. J Clin Exp Dent 2020;12(10):e950–e956. doi: 10.4317/jced.57140.
26. Padmanabhan S, Kumar A, Rai K. Biofeedback-assisted relaxation in pediatric dentistry: A clinical trial. J Oral Biol Craniofac Res 2022;12(2):210–215. doi: 10.1016/j.jobcr.2022.02.003.
27. Panchal S, Gurunathan D, Shanmugaavel AK. Efficacy of mobile application-based pre-visit preparation in reducing dental anxiety: A randomized controlled trial. Pediatr Dent 2022;44(2):112–118.
28. Patil L, Musale P, Kochhar HS. Effectiveness of pre-visit custom-made mobile application on dental anxiety in children. J Indian Soc Pedod Prev Dent 2020;38(3):280–286. doi: 10.4103/jisppd.jisppd_121_20.
29. Porritt J, Buchanan H, Asimakopoulou K, Marshman Z. Assessing children's dental anxiety: a systematic review of current measures. Community Dent Oral Epidemiol 2013;41(2):130–142. doi: 10.1111/j.1600-0528.2012.00740.x.
30. Prabhakar AR, Marwah N, Raju OS. Audiovisual distraction with video eyewear in pediatric dentistry. J Indian Soc Pedod Prev Dent 2018;36(2):142–148. doi: 10.4103/jisppd.jisppd_1120_17.
31. Prado IM, Carcavalli L, Abreu LG, Serra-Negra JM, Paiva SM, Martins CC. Validation of the Facial Image Scale for dental anxiety in children. Int J Paediatr Dent 2019;29(1):68–76. doi: 10.1111/ipd.12432.
32. Ran L, Zhao N, Fan L. Efficacy of virtual reality in reducing pediatric dental anxiety: A systematic review and meta-analysis. BMC Oral Health 2021;21(1):601. doi: 10.1186/s12903-021-01968-3.
33. Sethi A, Sareen K, Sharma M. Music therapy and acoustic control in pediatric dental operatory. Spec Care Dentist 2019;39(3):250–257. doi: 10.1111/scd.12371.
34. Shapiro M, Sgan-Cohen HD, Parush S, Melmed RN. Sensory adapted dental environments for children with and without developmental disabilities. Community Dent Oral Epidemiol 2007;35(4):252–261. doi: 10.1111/j.1600-0528.2007.00321.x.
35. Sharifi M, Ghasemi A, Rezaei M. Susceptibility to immersive VR distraction: A comparative study between pediatric and adult dental patients. VR in Medicine 2024;10(1):15–24. doi: 10.1016/j.vrmed.2023.100012.

36. Sharma A, Tyagi R, Verma L. Augmented reality in pediatric dentistry: A novel tool for behavior transformation. J Dent Child (Chic) 2023;90(2):85–91.
37. Sharma K, Bhatia R. Digital "Tell-Show-Do" vs. conventional techniques: A comparative clinical study. Eur Arch Paediatr Dent 2024;25(1):45–52. doi: 10.1007/s40368-023-00850-x.
38. Shindova MP, Belcheva AB. Behavioral management techniques in pediatric dentistry: From classical to contemporary approaches. Folia Med (Plovdiv) 2021;63(2): 170–176. doi: 10.3897/folmed.63.e54421.
39. Srinivasan I, Basha S, Parveen S. Audiovisual distraction vs. white noise in managing child anxiety during dental procedures. Eur J Paediatr Dent 2019;20(4):295–300. doi: 10.23804/ejpd.2019.20.04.07.
40. Zhao Y, Patel S, Kim J. Artificial Intelligence-driven adaptive virtual reality environments in pediatric dental management. IEEE Trans Affect Comput 2022;13(4):2100–2112. doi: 10.1109/TAFFC.2022.3189000.