

Thaumaturgy in Pediatric Dentistry: A Narrative Review of Wonder-Based Non-Pharmacological Behavior Guidance

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Abstract

Background: Dental anxiety is a persistent challenge in pediatric dentistry and may compromise cooperation, treatment quality, and future oral-health behavior. The term thaumaturgy has recently been used to describe wonder-based behavior guidance using magic tricks, illusion, storytelling, puppetry, humor, and selected immersive media to redirect attention and promote positive affect during dental care.

Objective: This narrative review clarifies the concept of thaumaturgy, differentiates it from routine distraction, play therapy, and Tell-Show-Do, and summarizes available evidence for its clinical use.

Methods: A structured narrative search was performed in PubMed/MEDLINE, Scopus, Web of Science, the Cochrane Library, and Google Scholar, supplemented by reference checking and professional guidelines. Search terms combined pediatric dentistry, child, dental anxiety, dental fear, behavior guidance, thaumaturgy, magic trick, distraction, puppet play, storytelling, audiovisual distraction, virtual reality, augmented reality, and clowning. English-language randomized trials, comparative studies, systematic reviews, meta-analyses, professional guidance documents, and highly relevant narrative reviews involving children or adolescents in dental settings were prioritized. Data were extracted descriptively for study design, age group, procedure, intervention, comparator, outcome measures, findings, and limitations.

Results: Most clinical studies report short-term reductions in anxiety, improved cooperation, or lower physiologic arousal when magic-based or fantasy-mediated distraction is added to conventional behavior guidance. Evidence is strongest for brief procedural distraction during local anesthesia and early-visit acclimatization; related evidence supports puppet play, audiovisual distraction, and virtual reality. However, available studies are heterogeneous and frequently limited by modest sample sizes, single-center designs, varied anxiety scales, limited blinding, and lack of long-term follow-up.

Conclusion: Thaumaturgy is best viewed as a promising adjunct within non-pharmacological behavior guidance rather than a replacement for established methods. Standardized protocols, validated outcome measures, multicenter trials, and follow-up studies are needed before it can be recommended as a stand-alone technique.

Keywords: Thaumaturgy; pediatric dentistry; dental anxiety; behavior guidance; magic distraction; puppet play; virtual reality; Tell-Show-Do.

I. INTRODUCTION

Dental fear and anxiety are common in children and adolescents and may lead to avoidance, disruptive behavior, increased pain perception, and difficulty completing preventive or operative care. Contemporary pediatric dentistry therefore emphasizes communication, trust, parental involvement, and individualized behavior guidance, rather than relying only on pharmacological control or physical stabilization [1-4].

Professional guidance documents describe a range of non-pharmacological methods, including Tell-Show-Do, positive reinforcement, distraction, desensitization, modeling, voice control, and memory restructuring. These techniques share the goals of establishing communication, reducing fear,

facilitating safe treatment, and promoting a positive attitude toward future dental visits [1,2].

Within this context, the term thaumaturgy has been introduced in pediatric dental literature to describe the use of magic and wonder as part of behavior guidance. Although the word has a theatrical origin, its dental use should not be interpreted as a mystical or unscientific intervention. Rather, it denotes a clinician-facilitated, developmentally appropriate form of active distraction that uses surprise, curiosity, play, and imagination to shift a child's attention away from threatening stimuli and toward positive engagement [7,10,22].

The original literature on dental thaumaturgy is still emerging. Many published studies are small clinical

trials or comparative studies, and closely related approaches such as puppet play, clowning, audiovisual distraction, and virtual reality have broader but heterogeneous evidence bases [5-8,15-21]. This review was revised to provide a clearer methodology, define the concept more precisely, appraise the strength and limitations of the evidence, and discuss ethical and practical considerations for clinical use.

Review methodology

This article is presented as a structured narrative review. It was not designed as a quantitative systematic review or meta-analysis; therefore, a pooled effect estimate was not calculated. However, to improve transparency and reproducibility, the search process, eligibility criteria, data extraction approach, and critical appraisal framework are described below.

Databases and search strategy

The search was updated in June 2026. Electronic searches were conducted in PubMed/MEDLINE, Scopus, Web of Science, the Cochrane Library, and Google Scholar. Additional records were identified by screening reference lists of relevant articles and professional guidance documents from pediatric dental organizations.

The search strategy combined controlled vocabulary and free-text terms related to the population, intervention, and outcome. Key terms included: child OR children OR pediatric dentistry OR paediatric dentistry; dental anxiety OR dental fear OR behavior guidance OR behaviour management; thaumaturgy OR magic trick OR magic distraction OR illusion OR storytelling OR puppet play OR play therapy OR clowning OR audiovisual distraction OR virtual reality OR augmented reality; and cooperation OR pain OR heart rate OR pulse rate OR Frankl OR Venham OR Facial Image Scale OR RMS-PS.

Eligibility criteria

Studies were considered eligible if they evaluated children or adolescents in a dental setting; examined thaumaturgy, magic-based distraction, puppet play, storytelling, clowning, audiovisual distraction, virtual reality, or closely related non-pharmacological behavior guidance; and reported outcomes related to anxiety, fear, pain, cooperation, behavior rating, physiologic response, or treatment acceptance. Randomized controlled trials, comparative clinical studies, systematic reviews, meta-analyses, professional guidelines, and highly relevant narrative reviews were included.

Studies were excluded when they were adult-only, focused exclusively on pharmacological sedation or general anesthesia without a non-pharmacological component, were unrelated to dental care, were not available in English, lacked sufficient bibliographic details, or provided only promotional or anecdotal

claims without clinical relevance. Case reports were not used as primary evidence, although broader healthcare literature on therapeutic magic was considered for conceptual context.

Study selection and data extraction

Titles and abstracts were screened for relevance to pediatric dental anxiety and non-pharmacological behavior guidance. Full texts or detailed abstracts were reviewed when the topic involved magic-based, wonder-based, or immersive distraction. The following information was extracted descriptively: author and year, study design, sample size, age range, clinical setting, intervention, comparator, anxiety or behavior assessment tool, main findings, and methodological concerns.

Critical appraisal approach

Because of heterogeneity in intervention type, clinical procedures, and outcome measures, evidence was appraised narratively rather than statistically. Particular attention was given to sample size, randomization, comparators, blinding feasibility, risk of performance and detection bias, validity of anxiety measures, follow-up duration, and generalizability to routine pediatric dental practice.

Conceptual definition and distinction from established approaches

For this review, thaumaturgy is defined as a brief, clinician-directed, wonder-based behavior guidance approach that uses magic tricks, illusion, playful storytelling, puppetry, humor, or selected immersive media to capture attention, evoke curiosity, and reduce the perceived threat of dental procedures. The term is used as an umbrella descriptor for a style of engagement rather than as a separate psychotherapeutic discipline.

Thaumaturgy overlaps with several established behavior guidance approaches, but it is not identical to them. Its distinguishing feature is the intentional creation of wonder or surprise. Generic distraction may involve any competing stimulus, such as music or a video; thaumaturgy specifically uses curiosity, illusion, fantasy, or active participation to intensify engagement. Play therapy is a broader therapeutic method that may involve child-led symbolic play and psychological processing; dental thaumaturgy is typically brief, procedural, and goal-directed. Tell-Show-Do familiarizes the child with an instrument or procedure through explanation, demonstration, and performance; thaumaturgy does not replace this explanation, but may be added before or during the procedure to reduce anxiety and build rapport [1,2,5,7].

Thus, in clinical practice, thaumaturgy should be considered an adjunct to conventional behavior guidance. It may be integrated with Tell-Show-Do, modeling, positive reinforcement, desensitization, parental presence or absence decisions, and

communication tailored to the child's developmental level.

Psychological basis

The theoretical basis of thaumaturgy is consistent with attention diversion and cognitive load principles. A child's attentional resources are limited; when a salient, emotionally engaging stimulus occupies attention, fewer resources may remain available for monitoring pain, threat, or procedural details. Magic tricks and fantasy narratives can therefore reduce the salience of the dental stimulus, especially during brief procedures such as local anesthesia administration [5,7,8,12].

Developmental factors are also relevant. Preschool and early school-aged children often respond strongly to imaginative play, make-believe, and surprise. A disappearing light, a coloring book illusion, or a puppet character can fit naturally within the child's cognitive world, reducing the sense that the dental chair is solely a medical setting. However, this developmental advantage also creates limits: older children may find simple tricks childish, while very young toddlers or children with sensory sensitivities may not understand or tolerate the intervention [10,12,14].

Active participation may further enhance the effect. When the child is invited to choose a character, hold a puppet, count before a magic reveal, or help the dentist 'find' a hidden object, the intervention can create a sense of control. This may counter helplessness and improve cooperation. The dentist's tone, timing, and responsiveness are critical; the same prop can be calming in one child and distracting or overstimulating in another.

Finally, positive affect and rapport may influence memory of the appointment. A child who associates the visit with humor and curiosity may form a less threatening memory of dental care. This mechanism is consistent with broader behavior guidance goals, although long-term evidence for sustained reduction in dental fear after thaumaturgy remains limited [1,2,22].

Techniques and clinical applications

Magic tricks and illusions

Simple magic tricks are the most direct form of dental thaumaturgy. Examples include LED thumb lights, magic coloring books, magic ropes, disappearing coins, and object-transformation illusions. These tricks are usually brief, inexpensive, and can be performed before or during non-invasive procedures, radiographs, or local anesthesia. Clinical studies suggest that magic-based distraction can reduce observable anxiety and physiologic arousal in children, particularly in the 3-8-year age group [7-14,23].

Magic should be simple, safe, and infection-control compatible. Props should not resemble sharp instruments, should be disinfected or protected with

barriers where appropriate, and should not delay essential care. The clinician should avoid frightening surprises or tricks that make the child feel deceived or embarrassed.

Storytelling and fantasy play

Storytelling reframes dental procedures in language that is understandable and less threatening to children. Suction may be described as a tiny vacuum, a prophy brush as a tickle brush, and plaque as sugar bugs. This method overlaps with guided imagery and Tell-Show-Do when explanations remain truthful and developmentally appropriate. The aim is not to conceal the procedure but to translate it into a playful frame that maintains cooperation.

Puppet play

Puppets or dolls can serve as intermediaries between the clinician and child. They may model mouth opening, ask questions on behalf of the child, or provide humorous commentary. A randomized clinical trial in an emergency pediatric dental clinic reported lower anxiety indicators in children exposed to puppet play compared with Tell-Show-Do alone, suggesting value in first-visit and urgent-care situations where trust must be built rapidly [15].

Humor, clowning, and theatrical interaction

Dental clowning and medical clowning share several features with thaumaturgy: humor, exaggeration, make-believe, role reversal, and playful communication. These methods may reduce anticipatory anxiety and operator stress, but require training and sensitivity to the child's temperament. Evidence is promising but still heterogeneous, and the approach may not be acceptable to every child or parent [20,21].

Digital, audiovisual, virtual reality, and augmented reality approaches

Digital distraction can range from cartoons and audio-visual aids to interactive games, virtual reality, and augmented reality. These methods are not thaumaturgy in the narrow sense of magic tricks, but they can be considered high-technology extensions of wonder-based distraction when they create immersion, novelty, or fantasy. Systematic reviews suggest that virtual reality can reduce dental anxiety and pain in children, but results vary according to age, device type, treatment procedure, outcome measure, and comparator [17]. Audiovisual distraction also shows potential, although some trials report improvement in pain or cooperation without significant reductions in anxiety [18,19].

Clinical use of immersive technology requires particular caution. The headset must not interfere with communication, airway monitoring, posture, or rapid response to distress. The content should be age-appropriate, non-frightening, and easy to stop immediately.

Evidence from included literature

Overall, the literature indicates a favorable short-term effect of magic-based and related distraction techniques, but conclusions should be interpreted cautiously. The most relevant evidence is summarized in Table 1. The included studies use different designs, age groups, interventions,

comparators, and anxiety assessment tools, limiting direct comparison and meta-analytic certainty.

Table 1. Representative studies and reviews included in the narrative synthesis

Study	Design / sample	Age setting and	Intervention and comparator	Outcomes	Main finding	Methodological considerations
Peretz and Gluck, 2005 [9]	Clinical comparative study; 70 children	3-6 years; strong-willed children in dental setting	Magic trick at start of visit compared with Tell-Show-Do	Cooperation, seating, radiograph acceptance	Magic improved cooperation and radiograph acceptance in young children.	Single clinical context; limited blinding; older assessment methods.
Konde et al., 2020 [10]	Clinical study; 240 children	2-13 years; pediatric dental procedures	Thumb light, magic book, item elimination; age-tailored tricks	Facial anxiety scale and behavior response	Age-specific magic tricks reduced anxiety and improved behavior.	Heterogeneous age range; limited standardization and follow-up.
Asokan et al., 2020 [11]	Randomized controlled pilot trial; 60 anxious children	4-5 years; dental procedures	Magic trick or mobile dental game compared with Tell-Show-Do	Anxiety and behavior scales	Magic and game-based distraction were favorable compared with conventional management.	Pilot design; small sample; short-term outcomes only.
Kothari et al., 2023 [12]	Randomized controlled trial; 30 children	4-6 years; inferior alveolar nerve block	Thaumaturgic distraction compared with conventional non-pharmacological methods	RMS-PS, Venham, pulse rate	Lower anxiety and more stable physiologic response were reported in the thaumaturgy group.	Very small sample; performance blinding impossible; no long-term follow-up.
Eregowda et al., 2023 [13]	Comparative clinical study; 120 children	5-6 years; routine pediatric dental treatment	Thaumaturgy compared with live modeling and Tell-Show-Do	Frankl behavior rating	Thaumaturgy produced better behavior scores than comparators.	Outcome mainly behavior score; operator and assessor blinding unclear.
Elfadul et al., 2025 [14]	Randomized clinical study; 102 children	3-7 years; local anesthesia administration	Magic rope and magic thumb sleeves compared with Tell-Show-Do	RMS-PS and heart rate	Both magic tricks reduced anxiety more than Tell-Show-Do, with comparable effects	Single-center design; immediate outcomes; long-term effect not tested.

Study	Design / sample	Age setting and	Intervention and comparator	Outcomes	Main finding	Methodological considerations
					between tricks.	
Khogeer et al., 2025 [15]	Randomized clinical trial; 50 children	3-6 years; emergency pediatric dental clinic	Puppet play therapy compared with Tell-Show-Do	Pulse rate and observed anxiety/behavior	Puppet play reduced anxiety indicators during emergency dental care.	Emergency setting may limit generalization; blinding difficult.
Rajeswari et al., 2019 [16]	Clinical comparative study; 45 children	6-10 years; preoperative pediatric dental setting	Cognitive behavioral play therapy and audiovisual distraction compared with Tell-Show-Do	Facial Image Scale and physiologic measures	Play-based intervention reduced preoperative anxiety more effectively than comparator methods.	Small sample; preoperative anxiety rather than full procedural behavior.
Barros Padilha et al., 2023 [17]	Systematic review; 22 randomized trials	Children receiving dental procedures	Virtual reality distraction compared with conventional or alternative behavior guidance	Pain, anxiety, behavior	Virtual reality generally reduced pain and anxiety and improved behavior.	High heterogeneity in devices, procedures, age groups, and outcome tools.
Prado et al., 2019 [5]	Systematic review of randomized trials; 20 studies	Children in pediatric dental practice	Multiple distraction techniques compared with conventional approaches	Anxiety, fear, pain, behavior	Distraction techniques may help, but certainty of evidence was very low.	Methodological limitations, inconsistent tools, and heterogeneity reduce confidence.
Lee et al., 2025 [8]	Systematic review and meta-analysis of randomized controlled trials	Children younger than 12 years	Magic distraction therapy compared with control or conventional methods	Dental fear and anxiety outcomes	Magic distraction therapy was associated with reduced dental fear and anxiety.	Quality and timing of interventions varied; conclusions depend on study context.

II. ETHICAL AND PRACTICAL CONSIDERATIONS

Ethically, thaumaturgy should be used to support communication and comfort, not to manipulate the child or conceal essential procedural information. Tricks should never be used to deceive the child about painful procedures or violate informed assent. When a sharp instrument or needle is introduced, the clinician should maintain honest, age-appropriate descriptions rather than pretending the procedure does not exist.

The content and props should be culturally sensitive, non-frightening, and age-appropriate. Some children may be frightened by sudden loud

surprises, masks, or certain clown characters; therefore, techniques should be tailored to individual temperament. The clinician must observe the child's cues and discontinue the trick immediately if signs of distress emerge.

Infection control is essential. Props should be easy to disinfect or should be protected with disposable barriers. Items dropped on the operatory floor must not be reused during the visit. In addition, small props that pose a choking or aspiration risk must be kept away from the oral cavity.

Practical implementation also requires training. A poorly timed trick may interrupt workflow, while an overly engaging trick may make the child hyperactive or resistant to sitting still. Clinicians

should practice brief, smooth routines that complement clinical steps rather than compete with them.

III. CLINICAL IMPLICATIONS

Thaumaturgy is most appropriate for children with mild to moderate anxiety who can attend to play, fantasy, or novelty. It is less suitable as a sole intervention for severe dental phobia, acute behavioral crises, or complex restorative care in very young or medically compromised children, where advanced pharmacological management may be indicated [1], [2].

A practical approach is to begin with conventional communication, Tell-Show-Do, and positive reinforcement, then add a brief magic trick or puppet interaction to build rapport or bridge an anxiety-provoking interval, such as topical or local anesthesia administration. Clinicians should observe the child's reaction and adapt the pace accordingly.

For research and training, dental schools and pediatric dentistry programs may consider teaching simple, ethically framed distraction skills alongside established behavior guidance. Training should emphasize safety, infection control, truthful communication, cultural sensitivity, and appropriate case selection rather than showmanship alone.

IV. FUTURE DIRECTIONS

Future studies should use larger multicenter randomized designs with concealed allocation, independent blinded outcome assessment where possible, preregistered protocols, and standardized intervention descriptions. Researchers should report the duration of the intervention, clinician training, timing relative to the procedure, baseline anxiety, pain control methods, and adverse events such as overstimulation or treatment interruption.

A core outcome set for pediatric dental anxiety trials would improve comparability. Recommended outcomes may include a validated child self-report scale, an observer-rated behavior scale, a physiologic measure, parent satisfaction, operator stress, treatment completion, and follow-up at subsequent appointments. Special attention is needed for older children, children with special health care needs, and culturally diverse populations.

V. CONCLUSION

Thaumaturgy provides a clinically relevant and child-centered adjunct to non-pharmacological behavior guidance in pediatric dentistry. By using wonder, play, and active distraction, it may reduce short-term anxiety and improve cooperation during selected procedures. The evidence base is promising but not definitive, owing to small samples, heterogeneity, variable outcome tools, potential bias,

and limited follow-up. Therefore, thaumaturgy should be integrated with established techniques such as Tell-Show-Do, positive reinforcement, desensitization, and individualized communication. With appropriate training, ethical use, and infection-control safeguards, it can expand the clinician's behavior guidance toolkit while future research clarifies its long-term effectiveness and best indications.

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