Original Article

pISSN 2383-9309 ▮ eISSN 2383-9317
J Dent Anesth Pain Med 2024;24(1):57-65 ▮ https://doi.org/10.17245/jdapm.2024.24.1.57

Evaluation of the effectiveness of tell-show-do and ask-tell-ask in the management of dental fear and anxiety: a double-blinded randomized control trial

Niharika Reddy Elicherla, Kanamarlapudi Venkata Saikiran, Karthik Anchala, Sainath Reddy Elicherla, Sivakumar Nuvvula

Department of Pediatric and Preventive Dentistry, Narayana Dental College and Hospital, Nellore, Andhra Pradesh, India

Background: The objective of behavioral guidance is to establish effective communication that aligns with a child's requirements to manage disruptive behavior. This study aimed to evaluate the effectiveness of the Tell-Show-Do and Ask-Tell-Ask techniques in managing dental anxiety in children during their initial appointment.
Methods: The study included 50 children (28 boys and 22 girls) without any prior experience between the ages of 7 and 11 at their first dental visit. The children were randomly categorized into two groups: Group 1, Tell Shows Do, and Group 2, Ask-Tell-Ask. Subsequently, all children underwent noninvasive treatment procedures such as restorations, sealants, and oral prophylaxis. Furthermore, behavioral management techniques were employed based on the allocated group. Finally, anxiety levels for all children were assessed using the Raghavendra, Madhuri, and Sujata Pictorial Scale (RMS-PS) and heart rate at three different intervals (before, during, and after). The obtained data were entered into Microsoft Excel, and statistical analysis was performed using SPSS software. A paired t-test and Mann–Whitney U-test were used to compare the mean and median values of the two groups and determine their effectiveness.
Results: Children in the TSD group exhibited statistically significant heart rates and RMS-PS scores in intra-group comparisons. However, children in the ask-tell-ask group showed a significant reduction only in the RMS-PS scores ($P < 0.001$) but not in the measures used to assess heart rate ($P < 0.001$).
Conclusion: Tell-Show-Do was more effective than ask-tell-ask in alleviating dental anxiety in children. The simultaneous application of these two strategies can synergistically alleviate dental anxiety during a child's initial dentist appointment.

Keywords: Ask-Tell-Ask; Dental Anxiety; Tell-Show-Do.

INTRODUCTION

The prevalence of dental fear and anxiety is of great significance to pediatric dentists because they can significantly impede a child's willingness to seek dental treatment, perhaps leading to more complications and the requirement for additional therapy [1]. The first dental visit plays a crucial role in shaping a child's perception of dental procedures and predicting the likelihood of successful future treatments [2]. An unfavorable initial dental experience can adversely affect the progression of treatment, leading to dental fear and anxiety in children [3,4]. Treating an anxious patient can be a source of stress for the pediatric dentist because of the patient's uncooperative behavior, which in turn results in longer

Received: January 5, 2024 • Revised: January 18, 2024 • Accepted: January 22, 2024
Corresponding Author: Karthik Anchala, Associate Professor, Department of Pediatric and Preventive Dentistry, Narayana Dental College and Hospital, Nellore, Andhra Pradesh, India
E-mail: karthikpedo@gmail.com

appointments and can have a negative impact on the child and the pediatric dentist [5]. Consequently, dental fear can undermine the efficiency and quality of the dental treatments provided to children [6].

Behavioral management approaches refer to techniques that enhance a child's ability to cope with challenges, resulting in complete acceptance and cooperation during dental procedures. These techniques aim to diminish children's perception that dental care is intimidating or overwhelming [7]. According to the AAPD, behavior management techniques can be non-pharmacological or pharmacological. Several non-pharmacological behavior management strategies encompass voice control, hypnosis, classical conditioning, aversive conditioning, distraction techniques, guided imagination, desensitization, parental presence/absence, memory restructuring, Tell-Show-Do (TSD), Ask-Tell-Ask, Animal-assisted therapy (AAT) and Eye movement desensitization and reprocessing (EMDR) [8,9]. Historically, this technique has been employed to familiarize children with various dental treatments and instruments, aiding them in overcoming anxiety regarding unfamiliarity. Dentists implement the TSD technique in the operatory phase, grounded in the principles of learning theory [10,11].

Most non-pharmacological behavior management techniques rely primarily on communication. Moreover, it is crucial to establish clear and effective communication to effectively manage young children effectively [12]. When dentists communicate dental procedures to children, they should exercise caution in avoiding excessive disclosure, as it may induce more dental fear and anxiety among children. In the dental literature, the ask-tell-ask technique is described as a method of verbal communication. This technique involves asking patients open-ended questions and assessing their understanding before providing them with information. Utilizing the Ask-Tell-Ask (ATA) technique, which was established in 2015, simplifies the process of improving a child's understanding of dental procedures [13]. This study aimed to assess the efficacy of Ask-Tell-Ask and Tell-Show-Do in managing dental anxiety and fear.

METHODS

1. Study design

This was a randomized controlled clinical trial conducted using a parallel-arm design with a uniform allocation ratio of 1:1, following the guidelines outlined in the Consolidated Standards of Reporting Trials (CONSORT) 2010 statement. The PICO question was as follows: children between the ages of 7–11 years allocated in the ask-tell-ask in comparison with the use of the tell-show-do technique showed a reduction in their anxiety levels. The Institutional Ethics Committee granted clearance for the trial (IEC/NDCH/2023/AUG-SEP/P-63). This study was registered with the Clinical Trial Registry of India [CTRI/2024/01/061878]. The study was conducted from October to November 2023, and the study took place in the Department of Pediatric and Preventive Dentistry. Consent was obtained from the parents or guardians of the children after receiving a comprehensive description of the treatment procedure.

Inclusion criteria:

1. Children without any past dental experience.
2. Children in the age range of 7–11 years.
3. Children who exhibited positive (+) or negative (-) behavior based on Wright's modification of the Frankl behavior rating scale [14].
4. Children willing to participate in the study provided informed written consent from their parents.
5. Children who require simple class I restorations and oral prophylaxis.

Exclusion criteria:

1. Children presenting with any of the systemic or mental disorders.
2. Children were definitely positive (++) or definitely negative (--) based on Wright's modification of the Frankl Behavior Rating Scale [14].
3. Children were unable to cope with the treatment procedures.

2. Sample size estimation

Primary screening was performed on 250 children aged 7–11 who visited the Department of Pediatric and Preventive Dentistry. The sample size was determined using the following equation:

$$n = \frac{2\sigma^2(z_{\alpha/2} + z_{\beta})^2}{\delta^2}$$

A sample size of 46 was attained with a confidence of 0.95 and a probability of 0.05. A random recruitment of 50 children was performed considering the risk of participant dropout after commencing the trial.

3. Randomization technique

Block randomization was performed using two different block sizes, four and six, and children who met the inclusion criteria were randomly allocated to two groups (TSD and ATA). One experienced pediatric dentist, unrelated to the study, performed the allocation.

4. Allocation concealment

Each trial participant was assigned a distinct serial number during randomization. Each child was assigned a number on identical sheets of paper, along with the group's name. These numbers were then sealed in impervious envelopes with the children's names on them. One experienced pediatric dentist who was not involved in the trial concealed this allocation.

5. Sample grouping

All children were randomly allocated to two groups with 25 members each: Group I: Tell-Show-Do (TSD) and Group II: Ask-Tell-Ask (ATA).

6. Blinding

The operator was not blinded to the type of intervention. However, the participant and statistician were blinded to the intervention or control group and the results of the analysis, respectively.

Written consent was obtained before the study, and the parents were informed of the clinical trial's goals, study design, and possible benefits. To prevent bias, the same pediatric dentist treated each child in both groups in the same setting, and behavioral evaluation parameters were assessed by another researcher who was not involved in the study.

7. Group I: Tell-Show-Do (TSD)

In this group, the children received verbal explanations of the treatment procedure and what would be done precisely. Following this, the child received demonstrations of the visual, auditory, and tactile aspects of the procedure, meaning that the child was demonstrated all the equipment and materials needed for the treatment; informed about the noise produced by the airotor; and shown how the suction, three-way syringe, and airotor worked. Finally, the patient was treated.

8. Group II: Ask-Tell-Ask (ATA)

The children were asked to share their emotions and fears regarding dental procedures. To make the children feel at ease with the dentist and the dental setting, they were free to express themselves without feeling compelled or afraid. After being addressed, the child was queried again regarding his views on the treatment, and the procedure was explained using euphemisms appropriate to his cognitive level. The child was presented with the treatment procedures once he or she was at ease.

9. Behavior evaluation method

Heart rate:

For both groups, heart rates were recorded at three time points: baseline, during, and after treatment.

Raghavendra, Madhuri, Sujata Pictorial Scale [RMS-PS]:

Behavioral management was subjectively evaluated using the RMS-PS. This scale contains a row of five faces ranging from very joyful to very dissatisfied. Two different sets of pictures were used for boys and girls. A very happy face on the scale received a value of one,

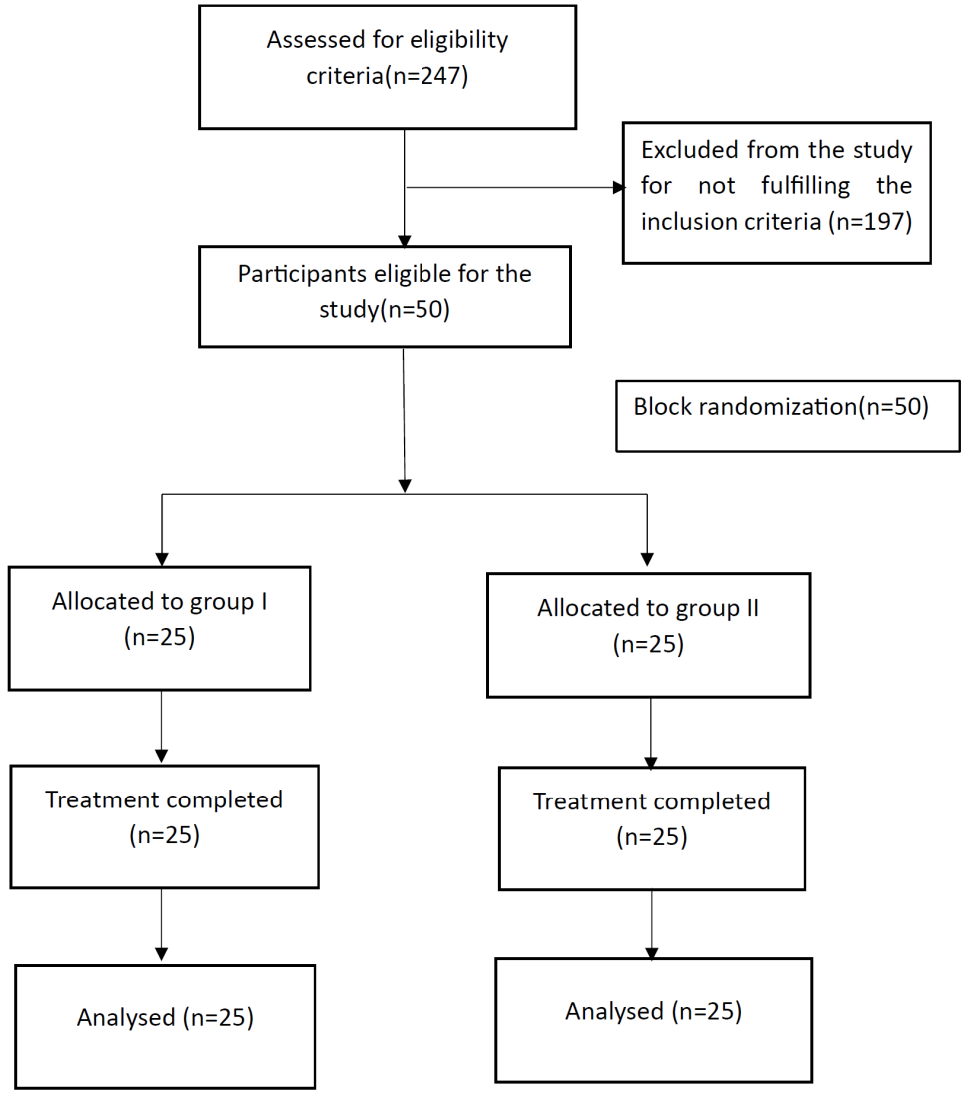

Fig. 1. Consolidated Standards of Reporting Trials (CONSORT) flow diagram. n, number.

and a very miserable face received a value of five. Children were instructed to select the face closest to themselves at that precise moment.

10. Statistical analysis

The data were entered into a Microsoft Excel Spreadsheet 2016. Statistical analyses were conducted using the SPSS software (version 21.0; Windows, SPSS Inc., NY, USA). Intergroup and intragroup heart rate comparisons were performed using paired t-tests. The Mann-Whitney U test was used to examine the differences in anxiety scores between the two groups based on the RMS-PS. Statistical significance was set at $P < 0.05$.

RESULTS

1. Demographic data

A consort flow diagram representing the random allocation of children (28 boys and 22 girls) who met all inclusion criteria is shown in Fig. 1. An equal distribution of male and female children was observed in both groups (14 boys and 11 girls in each group). Restorative procedures were performed in 30 children (16 boys and 14 girls), and oral prophylaxis was administered to 20 children (12 boys and 8 girls).

Intragroup comparison of heart rate and dental anxiety

Table 1. Intragroup comparison of heart rates in the Tell Show Do and Ask-Tell-Ask

	Intragroup comparison	Heart rate (Mean ± SD)	P-value
Group I (Tell Show Do)	Before vs During	107.1 ± 11.9 vs 100.1 ± 12.4	≤ 0.001**
	Before vs After	107.1 ± 11.9 vs 97.2 ± 11.9	≤ 0.001**
	During vs After	100.1 ± 12.4 vs 97.2 ± 11.9	0.005*
Group II (Ask-Tell-Ask)	Before vs During	94.8 ± 9.7 vs 97.3 ± 8.2	0.11
	Before vs After	94.8 ± 9.7 vs 96.8 ± 11.4	0.28
	During vs After	97.3 ± 8.2 vs 96.8 ± 11.4	0.44

SD, standard deviation; **, Highly significant; *, Significant.

Table 2. Intragroup comparison of median (IQR) RMS-PS anxiety scores across the two groups

	Intragroup comparison	Median (IQR)	RMS-PS Score (Mean ± SD)	P-value†
Group I (Tell Show Do)	Before	4 (3,5)	3.80 ± 1.08	≤ 0.001**
	After	2 (1,2)	1.72 ± 0.73	
Group II (Ask-Tell-Ask)	Before	4 (2,4)	3.40 ± 1.08	0.012*
	After	2 (2,3)	2.80 ± 0.91	

IQR, Interquartile range (25th percentile,75th percentile); SD, standard deviation; †, Mann-Whitney U test; **, Highly significant; *, Significant.

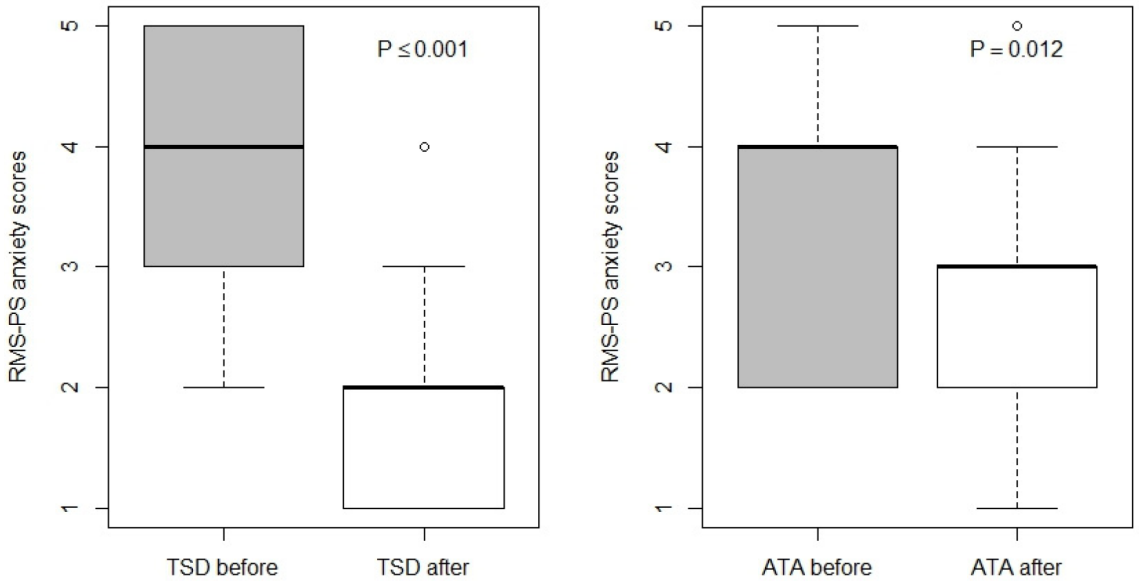

Fig. 2. Box Plot. ATA, Ask-Tell-Ask; TSD, Tell-Show-Do.

The intragroup comparison for heart rate illustrated a statistically significant reduction of scores for the children allocated in the tell-show-do group at all three time points, i.e., before vs. during (P-value ≤ 0.001), before vs. after (P-value ≤ 0.001), and during vs. after (p-value = 0.005). In contrast, no significant reduction in heart rate was observed for the children in the ask-tell-ask group at any of the three time points: before vs. during (P = 0.11), before vs. after (P = 0.28), and during vs. after (P = 0.44) (Table 1).

The intragroup comparison of subjective measures of anxiety using the RMS-PS median and mean scores demonstrated a significant anxiety reduction (P < 0.001) in all children in both groups (Table 2 and Fig. 2). A statistically significant reduction was observed in Group 1.

2. Intergroup comparison of heart rate and dental anxiety

Intergroup comparisons of heart rates showed a statistically significant difference before the start of the

Table 3. Intergroup comparison of heart rate and RMS-PS scores in the Tell Show Do and Ask-Tell-Ask

	Intergroup comparison	Tell Show Do (Mean ± SD)	Ask-Tell-Ask (Mean ± SD)	P-value
Heart rate	Before	107.1 ± 11.9	94.8 ± 9.7	≤ 0.001**
	During	100.1 ± 12.4	97.3 ± 8.2	0.45
	After	97.2 ± 11.9	96.8 ± 11.4	0.92
RMS-PS scale	Before	3.80 ± 1.08	3.40 ± 1.08	0.02*
	After	1.72 ± 0.73	2.80 ± 0.91	0.01*

RMS-PS, Raghavendra, Madhuri, Sujata Pictorial Scale; SD, standard deviation; **, Highly significant; *, Significant.

procedure (P < 0.001). In contrast, no statistically significant difference was observed in heart rate measurements between the two groups during (P = 0.45) and after the procedure (P = 0.92). However, mean heart rate scores were lower in the TSD group. In the ask-tell-ask group, the mean heart rate increased during the procedure, which decreased slightly after the procedure was completed. Similarly, when the intergroup comparison of the RMS-PS scores was performed, a statistically significant difference was observed in both groups before (p = 0.02) and after the procedure (P = 0.01) (Table 3).

DISCUSSION

Managing children is considerably difficult for dentists because they differ from adult patients in terms of psychological, emotional, and physical characteristics [15]. The child's nervousness hinders the dentist's expertise in providing exceptional care throughout the dental procedure [16]. Anxiety is an inevitable reaction to stressful situations that can negatively affect a child's behavior. Preoperative anxiety in pediatric patients can have long-term effects, such as greater postoperative discomfort and increased treatment challenges [17]. Factors such as age, dental and medical history, parental fear of receiving dental care, and parental attitudes may affect children's behavior during their initial dental visits [18,19]. Improving children's dental anxiety is crucial for alleviating dental fear and preventing them from developing anxiety.

Empathy and care for each child's well-being must be the cornerstones of any behavioral management strategy for pediatric dental patients [19]. This study was conducted among children aged 7–11 years, as this specific age group demonstrates notable levels of dental anxiety, as reported by Raadal et al. [20]. Furthermore, research conducted by Cuthbert et al. reported that children aged 6–7 years exhibited the most pronounced levels of dental anxiety [21].

Most non-pharmacological behavior management techniques aim to better understand children's cognitive, emotional, and social development to facilitate communication among dentists, children, and parents [22,23]. Dental practitioners have access to various behavioral modification techniques (BMTs), including voice control, hand-over-mouth, desensitization, modeling, distraction, positive reinforcement, TSD, protective stabilization, conscious sedation, and general anesthesia [18]. The predominant approach for effectively managing children's anxiety during pretreatment visits was TSD, which was introduced by Addleston in 1959. This strategy alleviates their expected anxiety by familiarizing them with novel processes [24]. Using this method, new instruments or procedures were introduced to the children through descriptions and illustrations, followed by the actual use of the instrument or application of the technique. Hence, this study used TSD as the control group.

Effective communication provides favorable results, including reduced child fear, compliance with healthy oral practices, and improved oral health outcomes. The pediatric dentistry literature describes various verbal communication techniques, such as Tell-Tell-Tell, Ask-Tell-Ask, and Teach-back, as effective ways to

enhance personal abilities in managing oral health.

In this study, one such communication technique, ask-tell-ask, was chosen because of its promising results compared with other communication techniques. In Ask-Tell-Ask, first "Ask" reflects the child's prerequisites, then tell means a minimal amount of information explained in a non-threatening way, and then "Ask" them regarding their comprehension and concerns [25].

An increase in the heart rate during dental procedures is directly related to dental anxiety. Therefore, employing a finger pulse oximeter to assess the pulse rate provides an objective way to evaluate a child's anxiety level [12]. In this study, a statistically significant reduction in heart rate was observed in the TSD group at three different points of the procedure. This is consistent with the studies conducted by Lekhwani et al. and Roshan et al., where TSD showed a reduction in dental anxiety postoperatively [1,12].

In contrast, in children in the ask-tell-ask group, there was no significant reduction in heart rate at any of the three points of the procedure. These findings are consistent with those reported by Lekhwani et al. The presence of lights, alarming sounds, and unpleasant sensations primarily cause anxiety and fear during the initial dental visit. When dentists ask about their fears, they may be unable to communicate their concerns [12].

In this study, along with an objective assessment, a subjective measure of anxiety was evaluated using the RMS-PS. Due to its colorful pictures and clear visual representation, children can readily comprehend and relate to this scale more than they can to black-and-white cartoons. Shetty et al. stated that a strong correlation was observed between the VPT and RMS-PS, and a moderate correlation was observed between RMS-PS and FIS, indicating the good validity of the RMS-PS in assessing dental anxiety in children [26]. Several studies conducted by Sedky et al., Elicherla et al., and Tyagi P stated that RMS-PS is efficient in evaluating anxiety in children [1,27,28]. In this study, RMS-PS scores were statistically significant for all children in both groups. This is because if children become accustomed to their dental environments, their arousal levels are reduced. This is consistent with the results reported by Elicherla et al. and Howitt et al. [27,29]. This study has various strengths, and it employed the most widely recognized method for behavioral control in pediatric dentistry, the TSD technique. Numerous studies have been conducted in the literature that compared various behavior management approaches; however, little information is available regarding the effectiveness of comparing one technique (TSD) with its modification (ask-tell-ask). The potential drawbacks of this study include the small sample size and the uneven age distribution of children. Future research should be conducted to assess the efficacy of invasive procedures involving local anesthesia using the ask-tell-ask behavioral guidance technique to confirm its effectiveness, as the treatment in this study was restricted to noninvasive procedures, such as simple class I restorations and oral prophylaxis. Considering the results of this study, behavioral guidance utilizing TSD is superior to ask-tell-ask in children with dental anxiety.

AUTHOR ORCIDs

Niharika Reddy Elicherla: https://orcid.org/0009-0008-6053-7412
Kanamarlapudi Venkata Saikiran: https://orcid.org/0000-0003-4949-9693
Karthik Anchala: https://orcid.org/0000-0002-6850-4948
Sainath Reddy Elicherla: https://orcid.org/0000-0002-6965-5262
Sivakumar Nuvvula: https://orcid.org/0000-0002-1204-5551

AUTHOR CONTRIBUTIONS

Niharika Reddy Elicherla: Conceptualization, Data curation, Writing - original draft
Kanamarlapudi Venkata Saikiran: Conceptualization, Data curation, Formal analysis, Methodology
Karthik Anchala: Investigation, Methodology, Supervision, Writing - original draft
Sainath Reddy Elicherla: Data curation, Supervision, Writing - review & editing
Sivakumar Nuvvula: Conceptualization, Methodology, Writing - review & editing

SOURCES OF FUNDING: Self-funded studies

DATA AVAILABILITY: The data analyzed in this study are

available from the corresponding author upon request.

CONFLICT OF INTEREST: The authors declare no conflicts of interest.

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