The Bioscan
AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES
20(3): S1: (3) 43-46, 2025
www.thebioscan.com

The Effect of Using a Camouflaged Dental Syringe on Children's Anxiety and Behavioral Pain: A Comparative Study

Dr. Nishith M Shah[1*], Dr. Anurag Thakuria[2], Dr. Kanchan Sharma[3], Dr. Sumit Bhatt[4], Dr. T. Hemalatha[5], Dr. Soundarya Vishwanathan[6]

[1*]Consultant Oral and Maxillofacial Surgeon, Ahmedabad - 380008, Gujarat
[2]MDS, Periodontolgy and Oral Implantology, Barman Dental Esthetics & Implant Centre, Dhirenpara Guwahati, Assam.
[3]Assistant Professor, Department of Orthodontics and Dentofacial Orthopaedics, Awadh Dental College and Hospital, Jamshedpur, Jharkhand
[4]Senior Lecturer, Department of Oral and Maxillofacial Surgery, Rajasthan Dental College and Hospital, Jaipur, Rajasthan
[5]Consultant Pedodontist, Cuddalore, Tamil Nadu
[6]Senior Lecturer, Department of Pediatric and Preventive Dentistry, Bangalore Institute of Dental Sciences, Bangalore, Karnataka

Corresponding Author: Dr. Nishith M Shah, Consultant Oral and Maxillofacial Surgeon, Ahmedabad - 380008, Gujarat, India.
Email id: drnishith_dentist@yahoo.com

KEYWORDS
Behavior management, anxiety, Distraction tech Local anesthesia.

Received on: 01-04-2025
Accepted on: 10-06-2025

Published on:
14-07-2025

ABSTRACT

Aim: The investigation aims to determine the positive effectiveness of customised camouflaged syringes instead of traditional ones on the children's behavior and anxiety levels. Materials and methods: 40 children between the ages of 4-10 participated in the research; they were allocated into two groups: group 1 (4–7 years) and group 2 (7–10 years). The first session used conventional syringes, while the second session used a specially designed camouflage syringe which utilized a split-mouth design in group 1 and vice versa in group 2. An anesthetic gel was given topically before the block was administered. Using the FLACC (Face, Legs, Activity, Cry, Consolability) scale behavior pain was assessed while local anesthetic (LA) was being administered. The children's degree of anxiety was expressed by the children using the Chotta Bheem–Chutki (CBC) pictorial scale after the block delivery. The samples were compared for significant differences ($p < 0.05$) using the Mann-Whitney U test. Results: Although there was no discernible difference in groups and gender, children's behavior was positively impacted by camouflaged syringes, which dramatically score lesser FLACC pain scale score and decreased anxiety on the CBC scale during LA. Conclusion: Children's conduct is positively impacted by camouflaged syringes. They effectively lower anxiety levels by increasing distraction.

1. Introduction:

Most people concur that fear is a person's reaction to a real threat to their life or a dangerous circumstance. Anxiety is an emotional state that sometimes blends together before the potentially dangerous stimuli is actually encountered.[1,2] For young patients, LA is one of the most delicate and difficult dental procedures. Numerous studies confirm the notion that dental anxiety is mostly caused by pain or the dread of discomfort, which also acts as a major deterrent to getting dental care.[2]

Because of general fear of unknown, phobia of needle, or physical damage some kids struggle to handle the behavioral demands and stimuli while visiting the dentist. To effectively treat young patients, thorough LA is necessary to reduce their anxiety and suffering during certain dental treatments. A nervous patient may experience longer-lasting, more intense discomfort during LA injection.[3,4] The dental syringe is seen as a dangerous tool both visually and psychologically, particularly by young people. The syringe can be camouflaged to reduce dental anxiety and panic and to serve as a useful diversion.[4] Thus, the study was designed to evaluate the effect of camouflage syringe in children's behavior and anxiety level.

2. Material and Methods:

This study was a split-mouth trial, conducted following approval by the Institutional Ethics Committee and written informed consent by the participating parents/caregivers. Children who needed inferior alveolar nerve block administrations for dental treatments in the deciduous mandibular teeth, having their first dental visit, fell into Frankel's behavior ratings 3 and 4 were included in the investigation. The study excluded all patients who fell into Frankl's behavior ratings 1 or 2, past terrible dental experiences, medically challenged illnesses and required emergency care.

40 Children between the ages 4-10 were split equally into two age-based groups. Both the groups received treatment at two different sessions. One pediatric dentist performed all the therapeutic procedures. During treatment, the tell-show-do method and positive reinforcements were employed as behavior control strategies. In both appointments, topical anesthetic gel was placed for 2minutes prior to the LA being injected at a rate of 1mL/minute.

In group 1 (ages 4–7), block injection was given using a conventional syringe having 27-gauge needle. During the LA administration, the investigator used FLACC behavior pain scale to score the child's behavior. After the LA administration, they were asked to use the CBC scale[5] (figure 1b) to indicate how anxious they were during the LA administration by pointing to a variety of pictures that ranged from very happy to running. The follow-up appointment was after 2 weeks where children received nerve blocks using a camouflaged syringe (figure 1a) having 27-gauge needle, and the FLACC and CBC scales were recorded as at the prior visit. A custom-made camouflage syringe has been created by affixing cartoon images to a disposable syringe. This attractive design conceals the syringe's barrel, helping to alleviate anxiety associated with injections. These syringes were not-autoclavable and discarded after use.

In group 2 (aged 7–10), a camouflaged syringe was used to inject the block first, then a regular syringe. The gathering of data was identical to that of group 1.

SPSS version 23.0 was used to tabulate and statistically analyze the gathered data. The Mann-Whitney U test was used for analysis which considered a probability value (p) ≤ 0.05 to be significant.

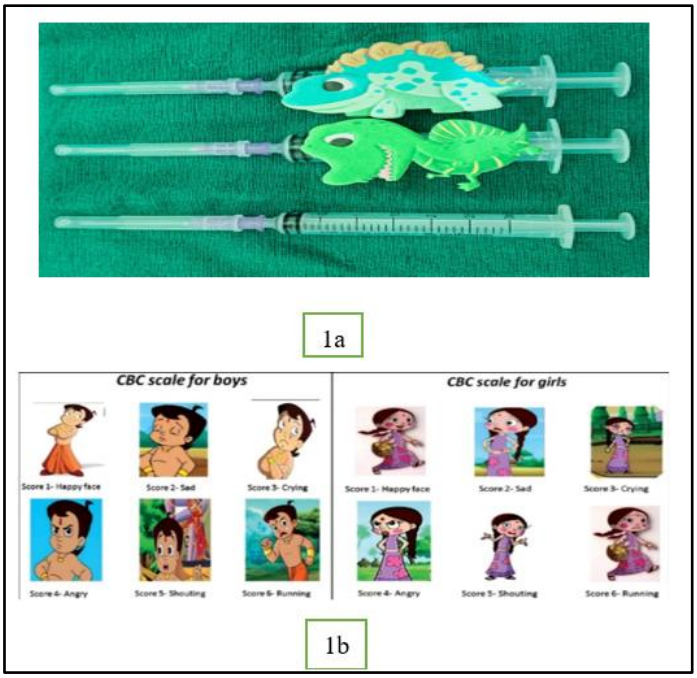

Figure 1: 1a-Conventional syringe on left and customised camouflage syringe on right; 1b-CBC scale

3. Result:

Table 1 delineates mode FLACC scores during the block administration showed that FLACC scores in camouflaged syringe was less in both the groups. Table 2 delineates mode CBC pictorial scale after the block administration found that CBC pictorial scale was less in camouflaged syringe in both the groups.

Table 1: Mode FLACC scores before and during the block administration

Area	Syringe type (group 1)	Mode	p-value	Syringe type (group 2)	Mode	p-value
Face	Conventional	2	<0.05*	Camouflage	1	<0.05*
	Camouflage	1		Conventional	2	
Leg	Conventional	2	<0.05*	Camouflage	1	<0.05*
	Camouflage	1		Conventional	2	
Activity	Conventional	2	<0.05*	Camouflage	0	<0.05*
	Camouflage	0		Conventional	2	
Cry	Conventional	2	<0.05*	Camouflage	1	<0.05*
	Camouflage	1		Conventional	2	
Consolability	Conventional	1	<0.05*	Camouflage	0	<0.05*
	Camouflage	0		Conventional	1	

*Significant

Table 2: Mode CBC pictorial scale before and after the block administration

Syringe type (group 1)	CBC Score	p-value	Syringe type (group 1)	Score	p-value
Conventional	3	<0.05*	**Camouflage**	1	<0.05*
Camouflage	1		**Conventional**	3	

*Significant

4. Discussion:

The present study sought to investigate the effect of using camouflaged syringes on children's anxiety and behavioral pain during dental procedures. With the understanding that anxiety and fear surrounding injections can significantly impact a child's overall experience, particularly in a dental setting, our research aimed to identify if a novel approach-utilizing visually appealing syringes adorned with cartoon images-could enhance pediatric patients' comfort and compliance.

Due to unfamiliarity with procedures, fear of pain, and general anxiety about injections children often exhibit heightened anxiety in dental scenarios. Visual and contextual factors can play a critical role in shaping children's perceptions during invasive procedures. By incorporating distraction techniques, such as attractive and engaging syringe designs, clinicians may mitigate fear and anxiety levels. The findings of our study corroborate these principles; specifically, we found that camouflaged syringes led to improved behavioral responses and lower anxiety levels, as indicated by the FLACC scale and the CBC pictorial scale.[6,7]

Present study designed utilizing split-mouth design where children were exposed to both conventional and camouflaged syringes. This approach enabled us to evaluate each child's subjective experience and reaction to both syringes. To assess how the syringe's design affected the kids' anxiety rather than the pain or discomfort of the actual surgery, a topical anesthetic gel was used prior to LA. Regardless of age and gender, the statistical analysis verified

substantial differences, showing that the camouflaged syringe efficiently reduced anxiety and enhanced behavioral outcomes when compared to the usual choice.[7]

The FLACC scale reliably measures behavioral pain in children during dental treatments by observing behaviors like facial expressions and activity levels. The CBC pictorial scale effectively captures children's subjective anxiety in an understandable format. Positive responses from both scales highlight the camouflaged syringes' effectiveness in engaging children during procedures.[8]

These syringes not only enhance dental office kid-friendliness but also improve overall procedure efficacy by reducing anxiety and increasing compliance. This can foster a better relationship with dental care and potentially reduce long-term dental anxiety in children.

Study limitations include a small sample size, lack of larger studies, no diverse populations, and coverage of different dental procedures. Further research should explore syringe designs and themes that resonate with various age groups or cultures. Longitudinal studies could help assess the long-term impact of these interventions on children's attitudes toward dental care.

5. Conclusion:

Camouflaged dental syringes significantly reduce anxiety and pain responses in children during dental procedures. By distracting young patients and alleviating fear, these syringes enhance pediatric dental practice. The findings highlight the importance of psychological factors in clinical interventions, leading to better patient experiences and outcomes.

6. References

1. McDonald RE, Avery DR. Dentistry for the Child and Adolescent. 7th Ed. St. Louis, Mosby. 2000, pp 283-4.
2. Frankl N. Should the parent remain with the dental operatory? J Dent Child 1962;29:150–163.
3. Appukuttan DP. Strategies to manage patients with dental anxiety and dental phobia: literature review. Clin Cosmet Investig Dent. 2016;8:35-50.
4. Al-kaf, A.G.A.; Othman, A.M. A review on needle free local anesthesia administration. Univ. J. Pharm. Res. 2017;2:21–25.
5. Sadana G, Grover R, Mehra M, Gupta S, Kaur J, Sadana S. A novel Chotta Bheem-Chutki scale for dental anxiety determination in children. J Int Soc Prev Community Dent. 2016 May-Jun;6(3):200-5.
6. Armfield J.M. How do we measure dental fear and what are we measuring anyway? Oral Health Prev. Dent. 2010;8:107–115.
7. Appukuttan DP. Strategies to manage patients with dental anxiety and dental phobia: literature review. Clin Cosmet Investig Dent. 2016;8:35–50
8. Manworren RC, Hynan LS. Clinical validation of FLACC: preverbal patient pain scale. Pediatr Nurs. 2003;29(2):140-6.