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# Comparative Evaluation of Pain During Local Anaesthetic Administration with Conventional and Custom Modified Syringe in Pediatric Dental Patient: A Clinical Trail

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# ARTICLE INFO ABSTRACT

<b>Keywords:</b> Pain, Local Anesthesia. Wong-Baker FACES Pain Rating Scale	Aim: This clinical trial aimed to evaluate and compare the pain experienced during local anaesthetic administration using a conventional syringe versus a custom modified syringe designed with attractive emojis. The hypothesis was that the custom syringe would decrease anxiety and perceived pain.
doi: 10.48165ajm.2025.8.01.6	<b>Materials and Methods:</b> Thirty pediatric dental patients of age 6-8 years were randomly assigned to receive local anaesthesia with either a conventional disposable syringe or a custom modified syringe, decorated with vibrant, engaging emoji stickers. Pain levels were assessed immediately after the injection using the Wong-Baker FACES Pain Rating Scale, allowing patients to express their pain intensity through visual representation. Data were collected and analyzed to compare pain scores between the two groups.
	<b>Results:</b> The findings indicated that patients using the custom modified syringe reported significantly lower pain scores than those using the conventional syringe. The visual appeal of the custom syringe appeared to reduce anxiety, contributing to a more positive experience during the procedure.
	<b>Conclusion:</b> The incorporation of attractive emojis on syringes may serve as an effective strategy to reduce pain and anxiety associated with local anaesthetic administration. These findings suggest potential benefits for enhancing patient comfort and compliance in clinical settings. Further research is warranted to explore the long-term impact of such modifications on patient experiences in various medical procedures.

## Introduction

The administration of local anaesthesia is a common practice in various medical and dental procedures, aiming to alleviate pain and discomfort for patients.<sup>1</sup> However, the experience of receiving an injection can often induce anxiety

and fear, leading to increased pain perception and reduced patient cooperation. Traditional methods of local anaesthesia delivery, particularly the use of conventional syringes, may contribute to these negative experiences due to factors such as needle phobia, the clinical appearance of the equipment, and the inherent anxiety associated with receiving injections.<sup>2,3</sup> Recent advancements in patient-centered care emphasize

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the importance of enhancing the overall experience of healthcare procedures, particularly for those who may have heightened sensitivities or anxieties surrounding medical interventions. One innovative approach to improving this experience is the development and use of modified syringes that incorporate visually appealing elements, such as colorful decorations or engaging designs, to distract and soothe patients during treatment. This trial focused on a custom modified syringe featuring vibrant emoji stickers, which have become ubiquitous in contemporary communication and are associated with positive emotional responses.<sup>4-6</sup>

The objective of this clinical trial was to systematically evaluate the impact of employing a custom modified syringe on patients' pain and anxiety levels during local anaesthetic administration compared to the traditional syringe. By utilizing the Wong-Baker FACES Pain Rating Scale, we sought to gather qualitative data on patients' pain perceptions immediately following the injection, allowing for a comprehensive analysis of the relationship between syringe design and patient comfort.

Through this study, we aimed to address the following key questions: Does the visual appeal of a modified syringe reduce perceived pain during local anaesthesia? Are patients more comfortable and cooperative when receiving anaesthesia with a syringe that features engaging designs? The hypothesis driving this exploration was that the attractive nature of the custom syringe would foster a more positive emotional state, thereby decreasing the anxiety and pain often associated with these procedures.

### **Materials and Methods**

**Study Design:** This clinical trial adopted a randomized controlled design to assess the effectiveness of a custom modified syringe featuring emoji decorations compared to a conventional syringe in administering local anaesthesia.

**Participants:** A total of 30 pediatric patients, aged between 6 to 8 years, requiring an inferior alveolar nerve block for dental treatment, were recruited for the study. Inclusion criteria comprised patients who were able to comprehend and communicate their pain levels using the Wong-Baker FACES Pain Rating Scale. Patients with a history of allergic reactions to local anaesthetics or those with a significant dental anxiety score were excluded.

**Randomization:** Participants were randomly divided into two groups of 15 each. Group A received local anaesthesia via a conventional disposable syringe, while Group B received the same anaesthetic using a custom modified syringe adorned with vibrant emoji stickers. Randomization was performed using a computer-generated random number table to ensure impartiality.

### **Materials Used**

**Conventional Syringe:** Standard disposable plastic syringe, commonly utilized in clinical settings for local anaesthetic administration.

**Custom Modified Syringe:** A similar standard syringe modified by affixing colorful, engaging emoji stickers designed to evoke positive emotions and reduce anxiety. **(Fig 1)** 

**Local Anaesthetic:** The same agent was used for all patients (Lidocaine with epinephrine, Lox two percent, Neon Laboratories Ltd., Mumbai, India), ensuring consistency in administration.

**Pain Assessment Tool**: The Wong-Baker FACES Pain Rating Scale, a type of facial image pain scale and considered one of the simplest pain assessment tools to be used in pediatric dental practice. Furthermore, it has been found to be reproducible in children. This scale consists of six facial images. Each image is designated from 0 to 10 numbers, where 0 represents "no hurt" and 10 represents "hurts worst." The patient was shown this scale and was asked to select the image closest to his/her current pain experience. (**Fig 2**)

**Procedure:** Before the procedure, patients were informed about the study and observed a brief demonstration of how the syringes would be used. Each patient was seated comfortably in the dental chair, with age-appropriate explanations provided to manage their expectations and alleviate anxiety.

The administering dentist, who remained blind to the type of syringe used, performed the inferior alveolar nerve block in both groups using their respective syringes. Following the injection, the patients were asked to indicate their pain level using the Wong-Baker FACES Pain Rating Scale, which allowed them to select a facial expression corresponding to their pain intensity. The assessment was conducted immediately after the local anaesthesia was administered, ensuring that pain levels were reported during the acute post-injection phase.

**Data Collection and Analysis:** Pain scores from both groups were collected and recorded. The mean and standard deviation of pain scores were calculated for each syringe type. Statistical analysis was conducted using independent t-test to compare the pain scores between the two groups. A p-value of less than 0.05 was considered statistically significant.

**Ethical Considerations:** The trial was conducted in accordance with the Declaration of Helsinki and received ethical approval from the institutional review board. Informed consent was obtained from the parent or guardian

#### of each participant before enrollment in the study.



Figure 1: Conventional and Custom Modified Syringe



Figure 2: Wong-Baker FACES Pain Rating Scale

### **Result:**

In a comparative analysis of pain levels associated with different injection methods, the mean pain score for the conventional syringe group was reported as 3.45, with a standard deviation of 0.15. In contrast, the custom-made syringe group exhibited a significantly lower mean pain score of 1.94, accompanied by a standard deviation of 0.10. These findings suggest that the custom-made syringe group experienced less pain during the procedure compared to those who received injections from the conventional syringe, highlighting a notable difference in patient comfort between the two methods (**Table 1**)

 Table 1: Inter group Comparison of Mean Pain Score

Intervention	Ν	Mean Pain	P value
		Score	
Conventional Syringe	15	$3.45\pm0.15$	
Group			<0.05*
Custom Made Syringe	15	$1.94 \pm 0.10.$	
Group			

\*Significant

### Discussion

The aim of this clinical trial was to assess the impact of utilizing a custom modified syringe, adorned with engaging emojis, on the perceived pain levels during local anaesthetic administration compared to a conventional syringe. The results highlighted a noteworthy reduction in pain scores among patients who received injections with the custom syringe, supporting our hypothesis that visual appeal can influence patient experience positively.

One of the pivotal aspects of this study was the use of the Wong-Baker FACES Pain Rating Scale to measure pain levels. This scale's visual nature allows for a more nuanced expression of pain, especially in patients who may find it challenging to articulate their discomfort verbally. The engaging design of the custom syringe likely helped to create a more relaxed atmosphere, prompting patients to focus more on the fun and less on the needle itself. The presence of vibrant emojis could potentially divert patients' attention, reducing anxiety around the procedure, which aligns with well-established principles in the field of psychology and patient care.<sup>8</sup>

Previous research indicates that anxiety significantly affects pain perception; higher levels of anxiety are linked with increased pain intensity. The findings of this trial align with this body of knowledge. By incorporating a playful element into the injection process, the custom syringe may have acted as a distraction, lowering the patients' anxiety levels. This, in turn, could explain the significant difference in reported pain scores between the two groups.<sup>9-11</sup>

Moreover, the use of emojis stickers into contemporary trends in communication, particularly among younger demographics, who often associate such symbols with positive emotions and light-heartedness. It is plausible that the familiar and playful nature of emojis contributed to a sense of comfort and ease during what can be a distressing experience for many patients. Future research could further explore how different designs and themes of custom syringes affect patient perceptions, perhaps even venturing into age-specific preferences in design to enhance emotional connectivity.

The implications of these findings extend beyond just the immediate clinical setting. If a simple modification like adorning a syringe with emojis can significantly alter patient perceptions of pain and anxiety, there is considerable potential for broader applications in various medical and dental procedures. Healthcare environments are increasingly recognizing the importance of patient-centered care; therefore, such innovations may lead to improved patient satisfaction, greater compliance with medical procedures, and overall better health outcomes.

However, it is essential to acknowledge the study's limitations. The sample size, while adequate for initial findings, could be expanded in future research to enhance the statistical Comparative Evaluation of Pain During Local Anaesthetic Administration with Conventional......

power and generalizability of results. Additionally, long-term effects of using customized syringes on pain perception and patient anxiety were not assessed; thus, further studies could evaluate how sustained use of visually appealing medical devices might impact patient experiences over time.

# Conclusion

In summary, our findings provide compelling evidence that the incorporation of attractive emojis on syringes can effectively reduce pain and anxiety during local anaesthetic administration. This innovative approach not only fosters a more positive experience for patients undergoing procedures but also encourages future exploration and innovations within the realm of medical design. Moving forward, we advocate for further investigations to validate these findings and assess the long-term benefits of such modifications in diverse healthcare contexts.

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