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EFFECTIVENESS OF TWO DISTRACTION TECHNIQUE FOR MANAGING ANXIOUS PEDIATRIC PATIENTS DURING IANB PROCEDURE

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Abstract

Pediatric patients often experience anxiety and fear during dental procedures, particularly during the administration of local anesthesia such as the Inferior Alveolar Nerve Block (IANB). This study aims to evaluate the effectiveness of two distraction techniques in managing anxiety among pediatric patients undergoing the IANB procedure. A total of 100 pediatric patients aged 5-10 years, with varying degrees of dental anxiety, were randomly assigned to two groups: Group 1 (fidget spinner) received audiovisual distraction using child-friendly videos projected on a screen, while Group 2 (light emitting ball) received interactive distraction through handheld electronic games. Anxiety levels were assessed using standardized scales before, during, and after the IANB procedure. Results showed a significant reduction in anxiety levels in both groups compared to baseline measurements. However, Group 2, which received interactive distraction, exhibited a more pronounced decrease in anxiety scores during the procedure and reported higher satisfaction levels post-procedure compared to Group 2. These findings suggest that interactive distraction techniques, such as handheld electronic games, are more effective in managing anxiety and improving patient experience during the IANB procedure among pediatric patients. Implementing such distraction techniques in dental settings can contribute to a more positive and comfortable dental experience for young patients, potentially leading to better cooperation and compliance with future dental treatments.

Keywords: Anxiety, Fidget Spinner, Light Balls, Distraction. IANB, Children.

INTRODUCTION

Pediatric dentistry is a specialized field that requires a deep understanding of child psychology and effective management strategies to ensure positive treatment outcomes. One of the key challenges faced by dental professionals is managing anxiety in pediatric patients, particularly during procedures such as the Inferior Alveolar Nerve Block (IANB) (Craig, Scott, Slayton, Walker, & Chi, 2019). Children often experience fear and apprehension in dental settings due to various factors, including the unfamiliarity of dental instruments, distressing sounds, and witnessing others' anxieties during procedures (Ricketts, Lamont, Innes, Kidd, & Clarkson, 2013). These anxieties can lead to non-cooperation, disruptive behavior, and avoidance of dental visits, compromising the delivery of essential dental care (Marinho, Higgins, Logan, Sheiham, & Group, 1996). The psychological readiness of children for dental care is influenced by several factors, both internal and external. Internal factors include the child's past experiences, temperament, and coping mechanisms, while external factors encompass the dental environment, communication strategies, and the behavior of dental staff (Agarwal, Dhawan, Kumar, Anand, & Tangri, 2017). Understanding and addressing these factors are crucial for creating a positive dental experience and fostering a lifelong positive attitude toward oral health. Anxiety in pediatric patients can manifest in various ways, leading to different categories of behavior during dental visits (Raj PS, Martin TM, Kumar MS, & Prathap L, 2024). Cooperative children typically exhibit calmness and cooperation, making dental

procedures smoother and more manageable. However, nervous children may show slight anxiety, requiring reassurance and encouragement to alleviate their fears. Fearful children represent a significant challenge, often displaying high levels of anxiety that can hinder cooperation and necessitate customized management approaches (Hutchins Jr, Young, Lackland, & Fishburne, 1997).

Anxious-avoidant children may actively avoid dental visits due to intense fear or anxiety, posing challenges in delivering necessary dental care (Costa, Ribeiro, & Cabral, 2012). Non-cooperative or difficult children may exhibit disruptive or non-compliant behavior, making it challenging for dental staff to conduct procedures effectively. Recognizing and categorizing these behaviors are essential steps in developing tailored strategies to manage anxiety and promote positive dental experiences (Selvaraj et al., 2021). The ambiance and design of the dental clinic play a crucial role in mitigating stress and anxiety in pediatric patients (McTigue, 2004). A child-friendly environment with colorful decor, engaging toys, and soothing music can create a welcoming atmosphere that eases anxiety and promotes relaxation. Implementing changes in the clinic's design and environment can significantly impact children's experiences and contribute to positive treatment outcomes (Khalid JP, Martin TM, & Prathap L, 2024). Distraction techniques are valuable tools in managing anxiety during dental procedures, especially those involving local anesthesia like the IANB. Distraction involves redirecting a child's attention away from discomfort or pain, thereby reducing fear and anxiety associated with the procedure. Common distraction interventions include deep breathing exercises, listening to soothing music, and watching favorite videos (Varshan I, & Prathap L, 2022). These techniques are safe, cost-effective, and often result in shorter procedure durations, making them favorable alternatives to sedation or restraint methods (Aminabadi, Erfanparast, Sohrabi, Oskouei, & Naghili, 2012).

In recent years, innovative distraction tools such as fidget spinners have gained popularity for their potential to engage and distract children during medical procedures. The fidget spinner light-emjson string ball is a novel distraction tool that offers visual and tactile stimulation, potentially reducing anxiety levels in pediatric patients undergoing dental procedures like the IANB (Chockalingam S, Sasanka K, Babu K Y, Ramanathan V, & Ganapathy D, 2020). Evaluating the effectiveness of this new distraction technique is crucial in expanding the repertoire of tools available to dental professionals and enhancing the overall dental experience for children. This study aims to assess the usability and effectiveness of the fidget spinner light-emjson string ball as a distractor in managing anxiety levels during the IANB procedure in pediatric patients (Prathap L, & Jayaraman S, 2022). By incorporating innovative distraction techniques and understanding the psychological needs of children, dental professionals can optimize their approaches, reduce anxiety, and improve overall treatment outcomes in pediatric dentistry.

MATERIALS AND METHODS

This study employs a randomized controlled trial (RCT) design to evaluate the effectiveness of two distraction techniques in managing anxiety among pediatric patients undergoing the Inferior Alveolar Nerve Block (IANB) procedure. The study adheres to ethical guidelines and has received approval from the institutional review board (IRB). The participants include pediatric patients aged 5-10 years who require dental treatment involving the IANB procedure. Patients with a history of severe dental

anxiety or cognitive impairments that may interfere with the study procedures are excluded (Srouji, Ratnapalan, & Schneeweiss, 2010).

Sample Size Calculation

Sample size calculation is based on previous studies evaluating distraction techniques in pediatric dentistry, considering a power of 80% and a significance level of 0.05. Group 1 sample size of 100 patients, with 50 patients in each group, is determined to detect significant differences in anxiety levels between the two distraction techniques (Singh, Rehman, Kadtane, Dalai, & Jain, 2014).

Randomization

Participants are randomly assigned to two groups using computer-generated random numbers to ensure allocation concealment and minimize selection bias. Group 1 receives audiovisual distraction, while Group 2 receives interactive distraction through handheld electronic games.

Intervention

Group 1 (Audiovisual Distraction): Patients in this group are provided with child-friendly videos projected on a screen during the IANB procedure. The videos are selected to be engaging and age-appropriate, aimed at diverting the child's attention away from the dental procedure. Group 2 (Interactive Distraction): Patients in this group are given handheld electronic games to play during the IANB procedure. The games are interactive and designed to capture the child's attention, providing a distraction from the dental experience (Singh et al., 2014).

Anxiety Assessment

Anxiety levels are assessed using validated scales before, during, and after the IANB procedure (Selvaraj, Sadasivam, Jothimani, & Muthusamy, 2023). The Modified Dental Anxiety Scale (MDAS) and the Facial Image Scale (FIS) are utilized to quantify anxiety levels subjectively and objectively, respectively (USHANTHIKA T, MOHANRAJ KG, 2020). The assessments are performed by trained dental professionals who are blinded to the group allocation.

Procedure

The IANB procedure is conducted following standard protocols by experienced dental practitioners. Local anesthesia is administered using age-appropriate techniques and dosage. The distraction techniques (audiovisual or interactive) are implemented from the beginning of the procedure until its completion.

Statistical Analysis

Statistical analysis is performed using appropriate methods, including descriptive statistics, t-tests, and analysis of variance (ANOVA), to compare anxiety levels between the two groups. Subgroup analyses based on age, gender, and baseline anxiety levels are also conducted to explore potential factors influencing the effectiveness of the distraction techniques (Nuvvula, Alahari, Kamatham, & Challa, 2015).

RESULT AND DISCUSSION

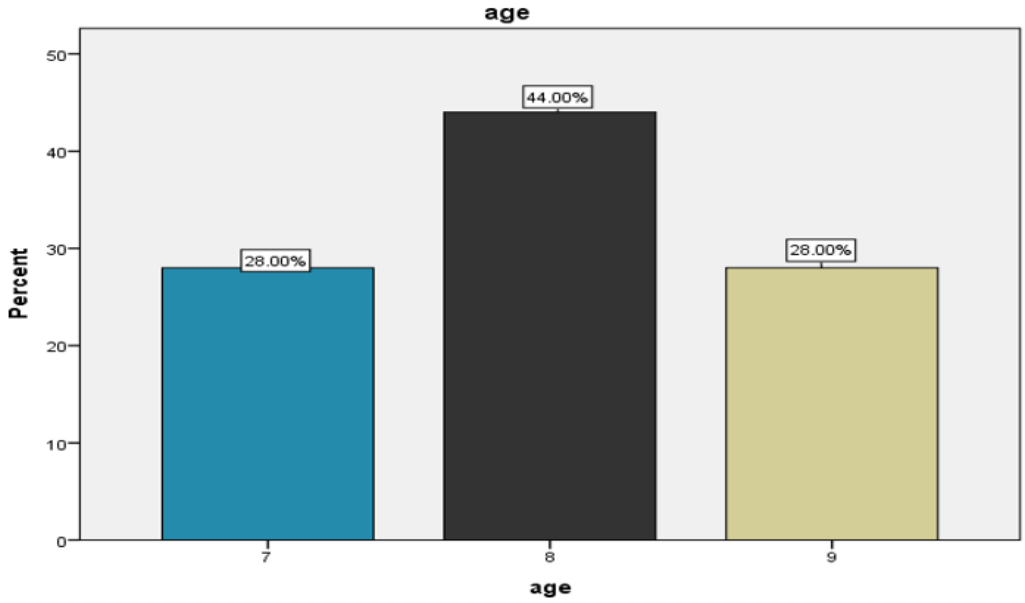

Figure 1: Graph 1 shows the age distribution of patient taken in this study. X axis denotes the age andY axis denotes the percentage of patient. From this it is inferred that about 44% were aged 8years, 28% aged 7 and 9 years respectively

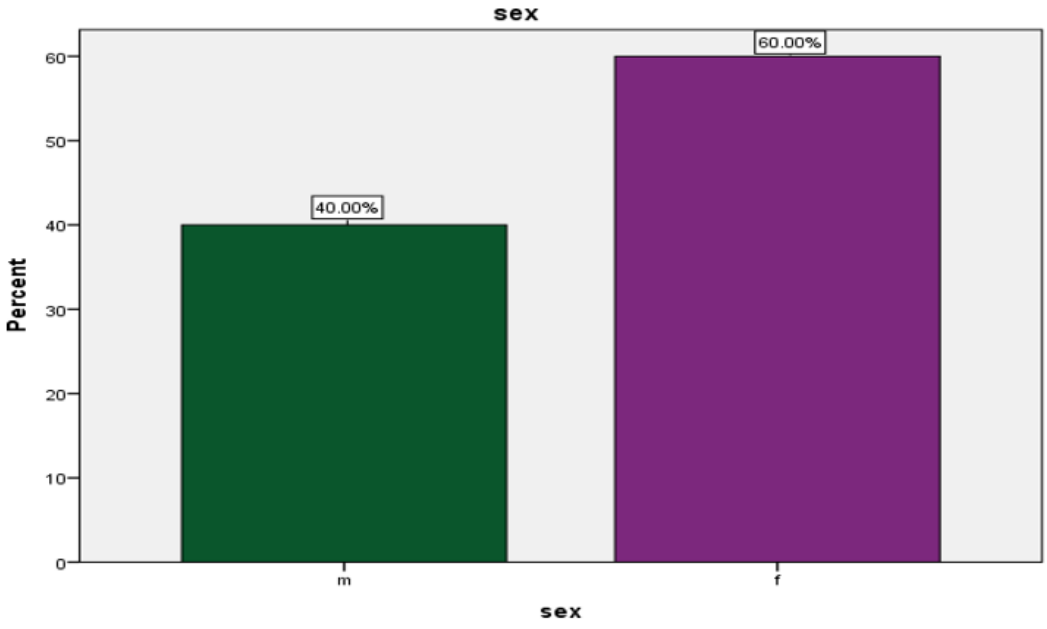

Figure 2: Graph 2 shows the sex distribution of patient taken in this study. X axis denotes the sex andY axis denotes the percentage of patient. From this it is seen that 60% were female children and 40% were male children.

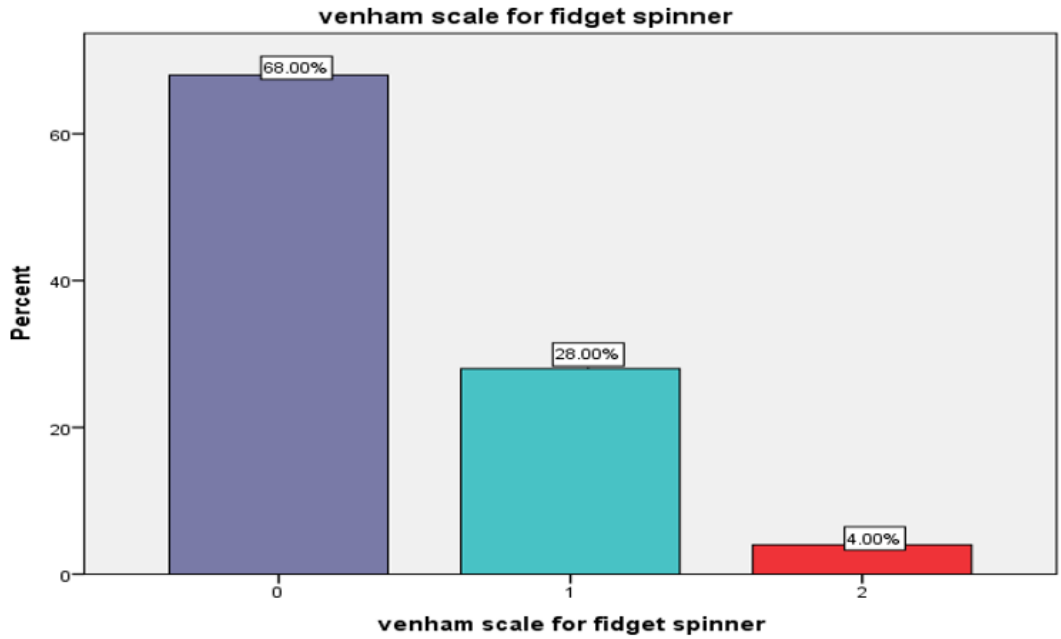

Figure 3: Graph 3 shows the venham scale scoring done using fidget spinner. X axis denotes the venham scale score and Y axis denotes the percentage of patient. From this it is seen that68% of the children were feeling relaxed, 28% felt uneasiness and 4% felt tensed during IANB procedure.

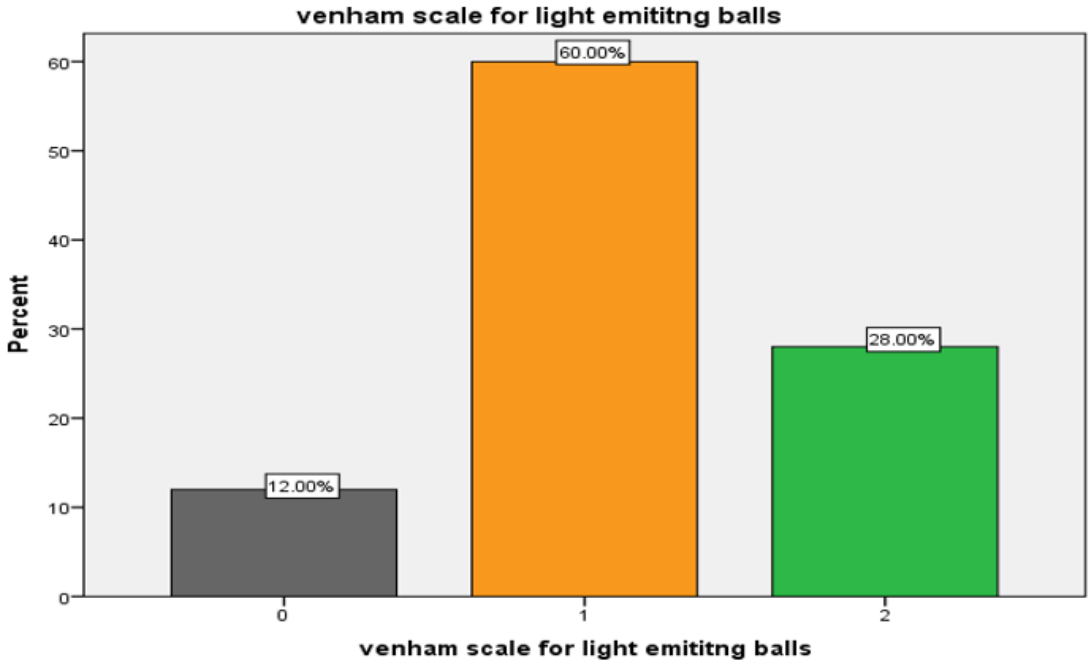

Figure 4: Graph 4 shows the venham scale scoring done using light emitting balls. X axis denotes thevenham scale score and Y axis denotes the percentage of patient. From this it is seen that 60% of the children were feeling uneasiness, 28% felt tensed and 12% were relaxed during IANB procedure.

DISCUSSION

The clinical trial utilized basic behavior modification techniques in preparing the child for the dental procedure and decreasing anxiety level. Behaviors of "tell-show-do" and positive verbal reinforcements through euphemisms were used. Telling-showing-do involves telling the child the procedure, showing him how it is done, and then doing it. Positive verbal reinforcements include the giving of commendation and encouragement during the procedure (Birnie et al., 2014). Euphemisms represent the attempt to describe something that could be frightening for the child in nice terms. Topical anjsonia was also applied to the area of anjuction one minute before both groups of subjects underwent the IANB procedure and contained the nummit spray with Lidocaine.

This topical anesthesia helps numb the injection site, thus significantly reducing discomfort during IANB. The children in Group 1 were told to engage in active fidget spinner play during the entire time of the IANB procedure. In the fjson file of this study, "fjsn","fjsn" fidget spinner was utilized as a coping tool, redirecting attention from the dental procedure to take place and to bring it back to the spinning toy. Children were engaged in playing with the fjsonset and were unlikely to focus on any pain or discomfort possible from the needle, and possible pain and discomfort, as well as anxiety related to the injection, which helped lower their stress (Windich-Biermeier, Sjoberg, Dale, Eshelman, & Guzzetta, 2007).

In group 1, the ultimate goal was to make them part of fidget spinner play, combining behavior modification techniques with topical anesthesia and making an environment of support and ease for children going through the procedure of IANB (Raj, Martin, Kumar, & Prathap, 2024). In Group 2, children were instructed to use light-emjson balls throughout the entire IANB procedure. In similarity to the fidget spinners used in Group 1, light-emjson balls served as a distractor tool with the goal of diverting the child's attention away from the dental procedure.

Engaging with colorful and visually attractive balls significantly reduced the period during which the children focused on their possible feelings of distress and worries over the processes of injections. Each child was allowed 5 minutes of habituation with their respective aid of distraction before the start of the IANB procedure. It is this time the children were acquainted with the fidget spinners or the light-emjson balls, and these helped in making them prime for use as tools of distraction during the dental procedure. All distraction methods and administration of IANB implementations were carried out by the dentist (Elkin, Perry, & Potter, 1996).

The anesthetic administered during the IANB was slowly injected using a 2 ml disposable luer lock syringe with a 26-gauge needle at 1 ml per minute to a total of 1.5 ml of lignocaine with adrenaline. This approach to aesthetic administration is stepwise, ensuring less discomfort and effectiveness of the numbness of the given injection site. Distraction techniques are categorized into two main types: passive distraction and active distraction.

Passive distraction involves the child keeping quiet as the dental professional distracts them by playing a movie, music, or reading a book. Active distraction, on the other hand, consists of the great involvement of the child in the activity used for distraction, such as singing songs, squeezing stress balls, practicing relaxation techniques, or playing with electronic devices.

Needle phobia and anticipation of needle injury are among the most common stimuli of situational anxiety in children during various dental procedures. Hence, they should be used only for selective interventions for distraction, like the use of fidget spinners or light-emitting balls (Khalid et al., 2024). The Venham Picture Test (VPT) was used in this study to measure self-reported anxiety in children. During some medical procedures, such as immunizations, using fidget spinners may therefore help decrease the level of tension or anxiety in a child by giving him or her something to socialize and talk about with others. In addition, it has been proved that the hyperactive movements involved in behaviors such as fidgeting actually make them perform more effectively in tasks of attention. The light-emitting balls involve the visual sensations and emotional reactions toward relaxation. However, according to the research, most children underwent more relaxation using fidget spinners compared to luminous balls (Abdelmoniem & Mahmoud, 2016).

CONCLUSION

Despite this contribution, some limitations can be appreciated in this study. First is the sample size: only 50 children at 7 to 9 years were part of the research. A bigger sample size, therefore, would provide better statistical power and generalizability of the findings. The studies were applied to children of a certain age group. The above studies formed the basis by which it was applied, hence guided, and, therefore, may not fully be used in regard to smaller children and, moreover, for older children. Besides, the inquiry measured only self-reported levels of anxiety using Venham's picture test. This may not account for the whole depth in how the anxiety level in the children's hearts actually feels during dental procedures. Future research could employ additional measures, such as physiological markers of stress or observations of behavior.

According to this study, the result indicated that fidget spinners significantly reduced the level of dental anxiety during the administration of IANB compared to light-emitting balls among children. Most children mention that they feel more relaxed while using a fidget spinner, and it is the same in this study. The active engagement and tactile stimulation from fidget spinners most likely led to the efficacy of distractions. Further social interactions, mediated by the fidget spinner, may have further lessened the anxiety, since the kids may have found comfort and a feeling of camaraderie amongst themselves through the medium. These findings suggest that fidget spinners may serve to distract within pediatric dentistry and are very effective in bringing the anxiety exhibited during invasive procedures like IANB administration down.

Dentists, as well as other providers working in the field of children's healthcare, may decide to introduce the use of fidget spinners and even develop their own protocols for using such a simple, non-invasive, and extremely cheap instrument to improve the dental experiences of children. It is important that distraction aids be selected either according to what an individual prefers or the need, because sometimes the children in question might be reacting to some of the stimuli differently. Future research should be done with larger sample sizes and diverse populations to fully confirm the findings described herein and further explore other strategies in reducing anxiety among pediatric dental care.

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