

The Use of a Stress Ball During Dental Procedures in Children as a Distraction Technique Does Squeezing a Stress Ball During Dental Treatment Decrease Anxiety and Increase Cooperation in Children?

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Introduction

As pediatric dental specialists, managing patient's anxieties and fears which can be multifactorial in origin is a common challenge.

For many children, visiting the dentist can be a daunting and frightening experience which creates dental anxiety and can lead to avoiding the dentist and only seeking dental care in emergency situations. This sense of anxiety can affect pain perception by decreasing pain threshold levels and elevating pain intensity (1).

The purpose of this study is to test the effectiveness of the stress ball as a distraction technique in children during dental treatment, specifically on its effects with anxiety and cooperation. The idea of cognitive refocusing, "a method based on the theory of pain where a distraction diverts pain perception by focusing attention to more amusing attractions(1)", was implemented using a stress ball.

The repeated act of squeezing and releasing a ball activates the muscles in one's hands and wrists which helps alleviate stress and anxiety (2). Since the use of the stress ball is considered an attention grabbing task which requires demand of attention away from the pain source, it is hypothesized that this will help alleviate anxiety in children and introduce an effective behavior management technique that can be implemented by pediatric dentists during treatment.



Fig 1. Yellow Stress Ball

Pictured above is the yellow stress ball used during the subjects' second operative visits as the distraction technique. Subjects were told to squeeze and release the ball in a repeated manner.

Study Objectives

- To determine if the use of a stress ball during operative procedures is an effective distraction technique.
- If the use of the stress ball as a distraction technique helps to decrease anxiety and increases cooperation, more focus can be placed on dental care rather than behavior management.

Methods

Subjects

- 32 healthy children between 5 and 16 years of age met the inclusion/exclusion criteria and took part in the study. Patients were recruited from St. Barnabas Health System and UHC dental clinic.
- The subjects participating will need two operative visits each, the first without the stress ball and the second visit with the stress ball. The operative visits can include procedures such as class I-III restorations, Stainless Steel Crowns and Pulpotomies.
- The study does not include children under the age of 5 due to motor skill development and object control which reaches development at around 5 years of age. "Locomotor and object-control skills grow between the ages of 3 and 6 years, with object-control skills growing faster than locomotor skills" (4). In order for the data to be as accurate as possible, the proper use of the stress ball in a repeated squeezing and releasing manner has to be ensured.

Patient Selection

Inclusion Criteria: 32 healthy children with treatment plans including operative procedures, such as, fillings, stainless steel crowns and pulpotomies.

Exclusion Criteria: Children that do not fall within the set age range of 5-16 years old. Children that do not need two visits of operative procedures.

Control group: Operative procedures completed without the stress ball

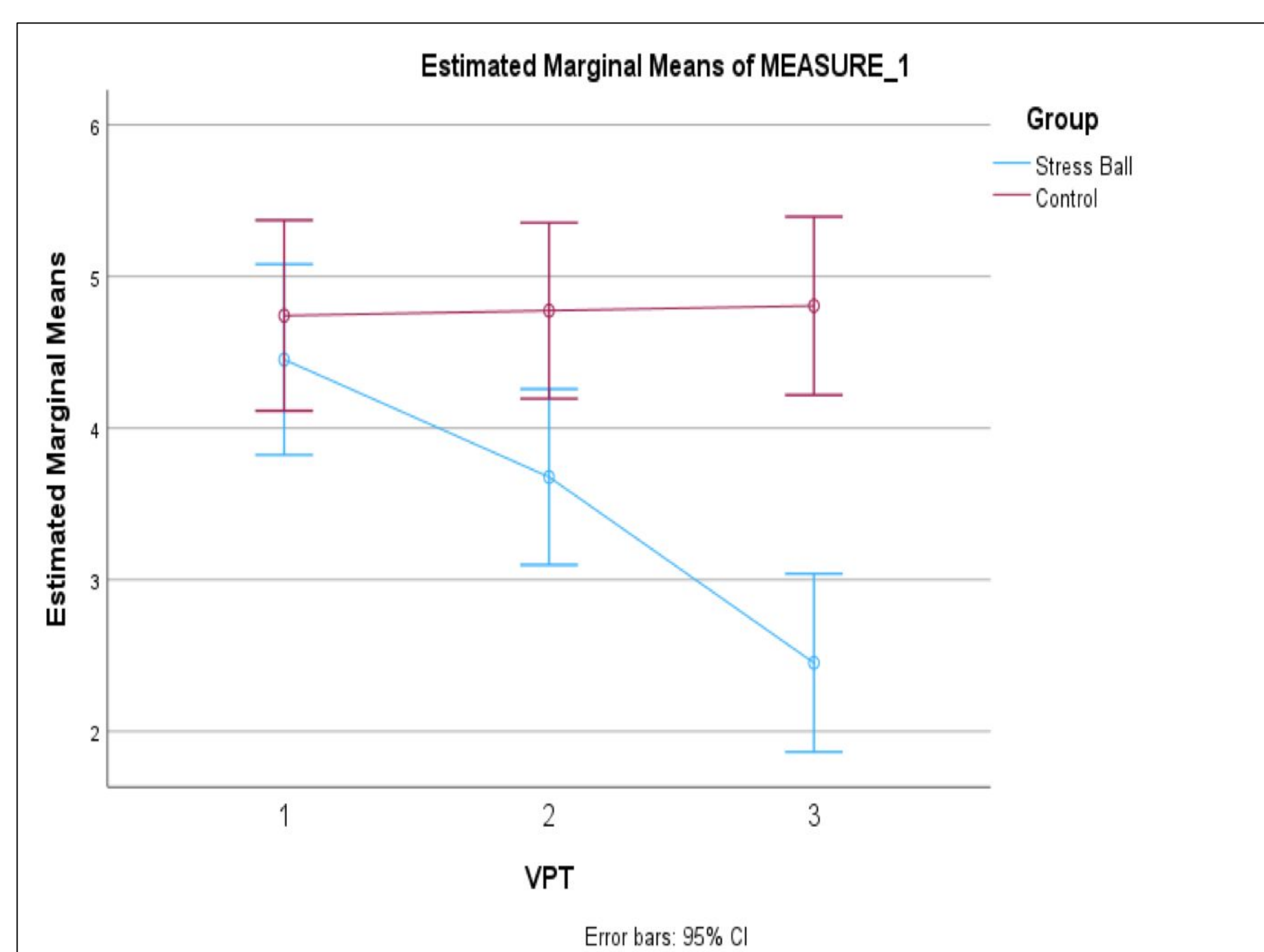
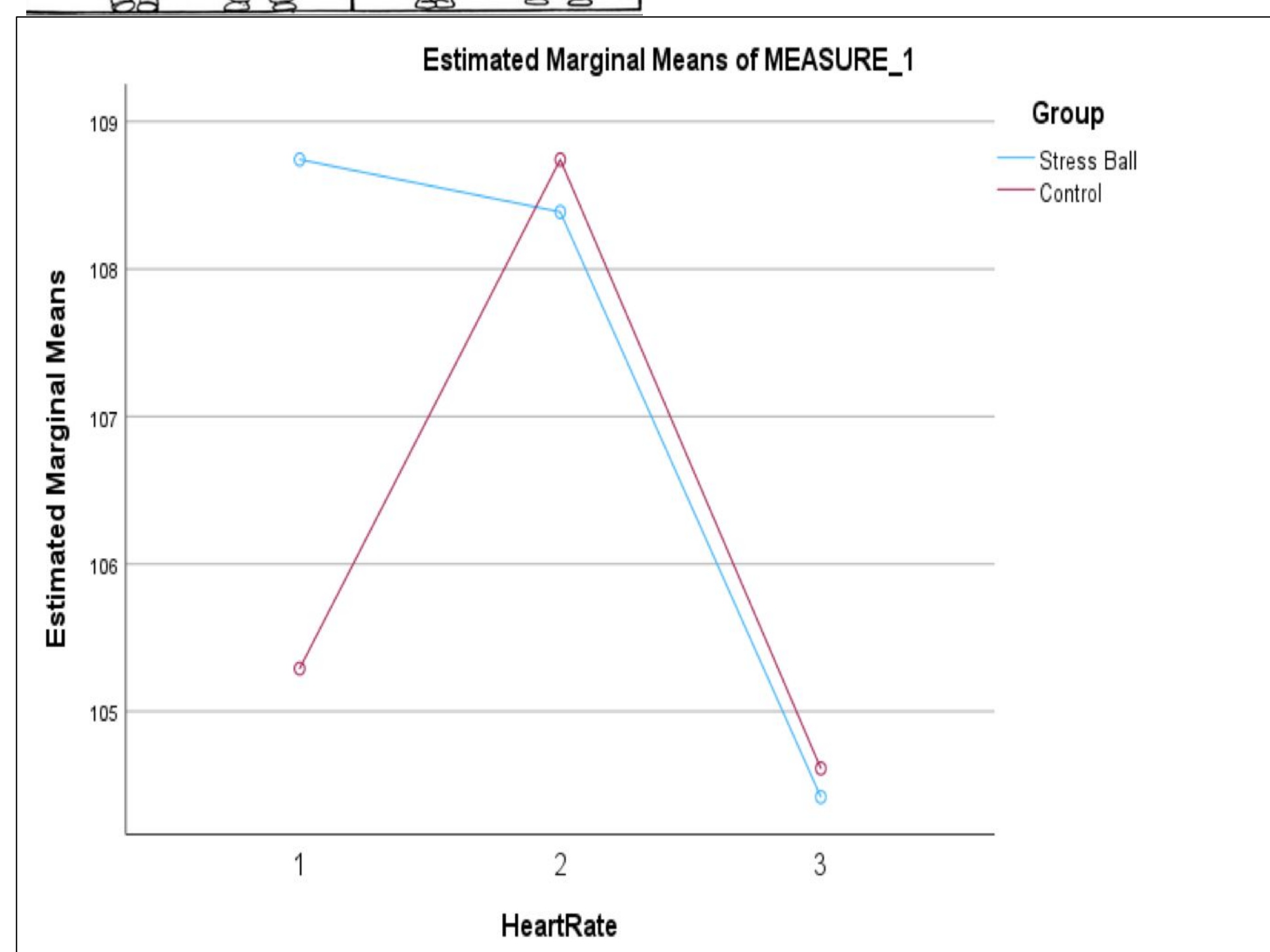
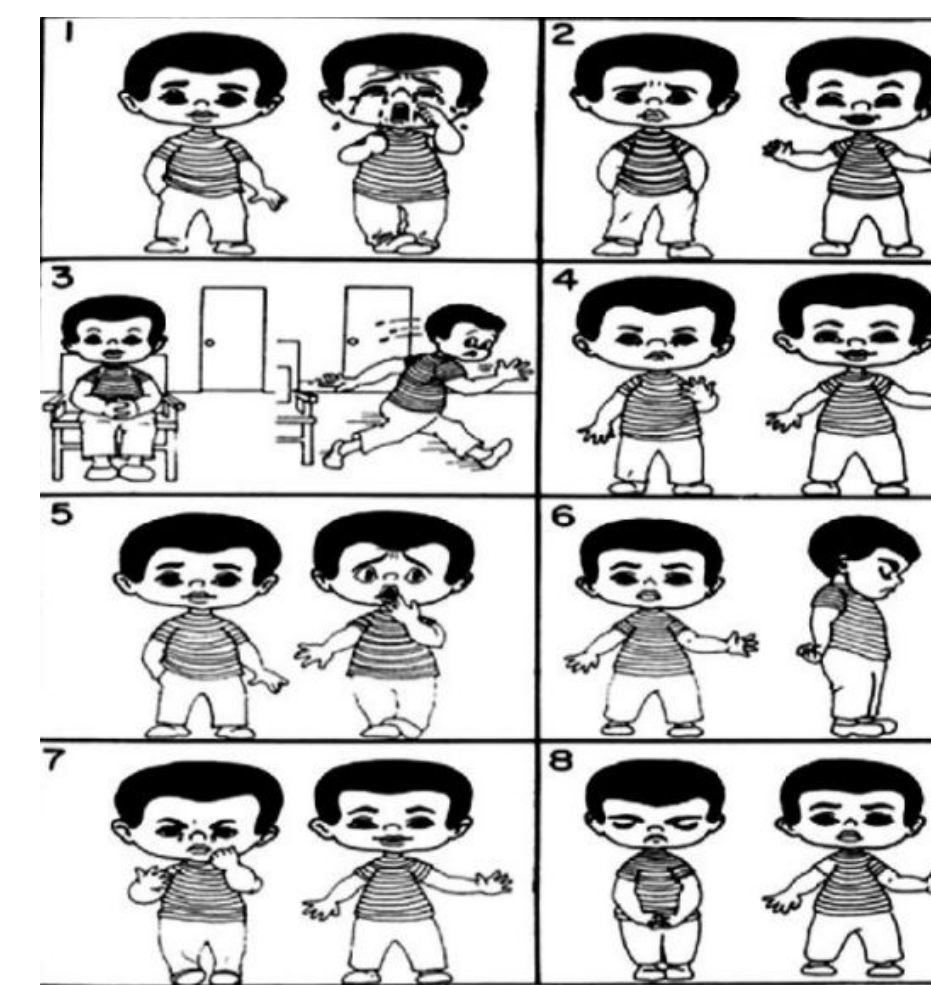
Data Collection

- Each subject was shown the Venham Picture Test to measure dental anxiety prior to, during and after the dental treatment. The Venham Picture Test is a psychometric test that estimates the prevalence of dental anxiety consisting of eight cards with pictures of children in different dental situations (3).
- There are two figures on each card, one in which a child appears happy and the other in which the child looks distressed. The children were asked to point at the figure that represented their feelings at that given moment (3).
- A score was recorded for each card when the "high fear" picture was selected and summed to give a total score of eight. Higher scores indicate greater fear.
- Blood pressure and heart rate were measured at the same stage of the dental visit for each participant; it was first measured prior to treatment followed by during the treatment (after local anesthesia administration) and lastly at the conclusion of the procedure.

Results

Statistical Analyses

A repeated measures analysis of variance test was completed to look at the clinical ratings of anxiety before during and after the procedure. Independent samples of test of the Venham picture test, the effects of tests between subjects before and during procedure resulted in $p < 0.05$



Discussion

- Using a stress ball as a distraction technique proved to have significant results in reducing anxiety according to heart rate measurements and the Venham picture test. However, no significant results were observed through blood pressure and pulse rate measurements.
- $F = 9.519$, $p < 0.003$ which indicates statistical significance for measures in heart rate and $F = 10.824$, $p < 0.002$ which indicates statistical significance for the Venham Picture Test.
- Although there were statistically significant results in heart rate and the Venham picture test indicating less fear as the stress ball was used during the operative procedure, there were no significant results in the values measured for blood pressure and pulse rate.

Conclusion

This study demonstrates that the use of a stress ball during operative procedures in children ages 5-16 years old has significant effects on decreasing anxiety and increasing cooperation in a dental setting when measuring heart rate values and the Venham Picture Test.

Study Limitations

- One of this study's limitations is a small sample size of 32 patients.
- The second study limitation is the short duration of the study being 12 months of data collection.

References

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