ANNEXURES
ANNEXURE -I

Formula used for the analysis

**Arithmetic Mean**

The most widely used measure of central tendency is arithmetic mean, usually referred to simply as the mean, calculated as

$$ X = \frac{\sum_{i=1}^{n} X_i}{n} $$

**Standard deviation and standard error**

The standard deviation (SD) is the positive square root of the variance, and calculated as

$$ SD = \sqrt{\frac{\sum_{i=1}^{n} X_i^2 - (\sum_{i=1}^{n} X_i)^2}{n(n-1)}} $$
and SE (standard error of the mean) is calculated as

\[
\text{SE} = \frac{\text{SD}}{\sqrt{n}}
\]

Where, \(n=\) no. of observations

**Minimum and Maximum**

Minimum and maximum are the minimum and maximum values respectively in the measure data and range may be defined as below

\[\text{Range} = \text{Min} \text{ to } \text{Max}\]

and also evaluated by subtracting minimum value from maximum value as below

\[\text{Range} = \text{Maximum value} - \text{Minimum value}\]

**Median**

The median is generally defined as the middle measurement in an ordered set of data. That is, there are just as many observations larger than the median as there are smaller. The median (\(M\)) of a sample of data may be found by first arranging the measurements in order of magnitude (preferably ascending). For even and odd number of measurements, the median is evaluated as

\[M = [(n+1)/2]^{th} \text{ observation} - \text{odd number}\]

\[M = [n(n+1)/2]^{th} \text{ observation} – \text{even number}\]
Analysis of Variance

Analysis of variance (ANOVA) is used when we compare more than two groups simultaneously. The purpose of one-way ANOVA is to find out whether data from several groups have a common mean. That is, to determine whether the groups are actually different in the measured characteristic. One way ANOVA is a simple special case of the linear model. For more than two independent groups, simple parametric ANOVA is used when variables under consideration follows Continuous exercise group distribution and groups variances are homogeneous otherwise non parametric alternative Kruskal-Wallis (H) ANOVA by ranks is used. The one way ANOVA form of the model is

\[ Y_{ij} = \alpha_j + \varepsilon_{ij} \]

where;

- \( Y_{ij} \) is a matrix of observations in which each column represents a different group.
- \( \alpha_j \) is a matrix whose columns are the group means (the “dot j” notation means that \( \alpha \) applies to all rows of the \( j^{th} \) column i.e. the value \( \alpha_{ij} \) is the same for all \( i \)).
- \( \varepsilon_{ij} \) is a matrix of random disturbances.

The model posits that the columns of \( Y \) are a constant plus a random disturbance. We want to know if the constants are all the same.

Bonferroni’s multiple comparison test

After performing ANOVA, Bonferroni’s multiple comparison test is generally used to calculate differences between group means as

\[ q = \frac{\bar{X}_1 - \bar{X}_2}{SE} \]
where,

\[ SE = \sqrt{\frac{S^2}{2} \left( \frac{1}{n_1} + \frac{1}{n_2} \right)} \]

\( S^2 \) is the error mean square from the analysis of variance and \( n_1 \) and \( n_2 \) are number of data in group 1 and 2 respectively.

**Statistical significance**

**Level of significance** "\( p \)" is the probability signifies level of significance. The mentioned \( p \) in the text indicates the following:

- \( p > 0.05 \) Not significant (ns)
- \( p < 0.05 \) Just significant (*)
- \( p < 0.01 \) Moderate significant (**)
- \( p < 0.001 \) Highly significant (***)
ANNEXURE- II

Ethical Clearance certificate

This is to certify that the Ethical Committee of Rama Dental College, Hospital & Research Centre has reviewed and approved the study titled “CONTRIBUTION TO ASSESSMENT OF FRACTURE RESISTANCE OF CORE BUILD UP MATERIALS ON ENDODONTICALLY TREATED TEETH WITH SPECIAL REFERENCE TO MECHANICAL PROPERTIES OF FOUR RECENT RESIN BASED DIRECT CORE BUILD UP MATERIALS” to be carried out by Dr Mohammad Iqbal (Ph.D Scholar), in Department of Conservative Dentistry & Endodontics.

(                                           )

Dr Anil Kohli
Prof & Head, Department of Paediatric Dentistry

DATE: & HEAD OF ETHICAL COMMITTEE