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Compressive Fatigue Behavior of Dental Restorative Composites

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Abstract:
The purpose of this study was to investigate the compressive fatigue behavior of five dental composites. Cylindrical specimens of 8 mm length and 4 mm diameter were made according to manufacturers' recommendations and stored for two weeks in distilled water at 37°C. Compressive fracture strength was measured, and subsequently fatigue tests at 10 Hz frequency were carried out in distilled water. Compressive fatigue strength was thereby obtained using the staircase method for 10^5 cycles (n=17) under sinusoidal loading. Acquired data for compressive fracture strength were analyzed using ANOVA and Weibull statistics. Among the dental composites examined, Filtek® Z250 exhibited the highest fatigue strength. This seemed to be due to the superior matrix properties coupled with a specific filler type at the highest weight%/volume% ratio. In addition, fracture mechanisms of the composites were examined.

Key words:
Dental composites, Compressive fatigue, Fracture mechanism

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