Original Research

Thermocycling Effect on the Flexural Strength of Fiber-Reinforced and Conventional Flowable Composite

Abstract

Aim: Flowable resin composites are widely used in restorative dentistry but are prone to mechanical degradation under oral conditions. This study evaluated the impact of thermocycling on the flexural strength of a short fiber-reinforced flowable composite compared to two conventional flowable composites. **Materials and Methods:** Rectangular specimens (25 × 2 × 2 mm) were fabricated using EverX Flow (Group E), Tetric EvoFlow (Group T), and Tokuyama Universal Flow (Group P) ($n = 14$ per material). Half the samples were tested immediately; the other half were subjected to thermocycling with 500 cycles (5–55°C, 10 s
dwell). Flexural strength was tested using a 3-point bending test. One-way analysis of variance, paired t tests, and *post hoc* Duncan's
test were used ($\alpha = 0.05$). Effect sizes (Cohen's d) and 95% confidence intervals were calculated. **Results:** EverX Flow exhibited the highest flexural strength before (30.56 ☒} 9.55 MPa) and after aging (27.45 ☒} 4.25 MPa), with no significant reduction postthermocycling
($P = 0.791$, $d = 0.30$). Tetric EvoFlow showed the lowest strength post-aging (16.38 ☒} 2.11 MPa) with a significant reduction ($P < 0.001$, $d = 1.90$). Tokuyama Universal Flow also exhibited a notable decrease ($P = 0.001$, $d = 0.84$).
Conclusion: The short fiber-reinforced composite demonstrated superior flexural strength and resistance to thermal aging compared to conventional flowable. EverX Flow demonstrated superior flexural strength and thermal stability, indicating its potential suitability for stress-bearing restorations.