INTERACTION BETWEEN NANOFILLED COMPOSITES AND POLYWAVE MULTILED CURING LAMPS: AN IN VITRO STUDY

	ENAMEL PREPARATION	MATERIAL EMPLOYED ON DENTIN SUBSTRATE
GROUP 1	Bevel	Flowable resin + Nanofilled Composite
GROUP 2	Bevel	Nanofilled Composite
GROUP 3	Butt-Joint	Flowable resin + Nanofilled Composite
GROUP 4	Butt-Joint	Nanofilled Composite

Results: Samples treated with Method 1 demonstrated significantly higher levels of interfacial microleakage ($p<0.001$) than Method 2, independently of enamel and dentinal treatments. Enamel finishing technique ($p=0.0756$) and the presence of flowable resin on dentin ($p=0.632$) did not influence the interfacial cellular penetration with CLSM.
Conclusions: The first hypothesis was accepted, since CLSM showed results qualitatively and quantitatively more reliable than dye penetration. The second and third hypotheses were rejected.

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Category: Student's Session

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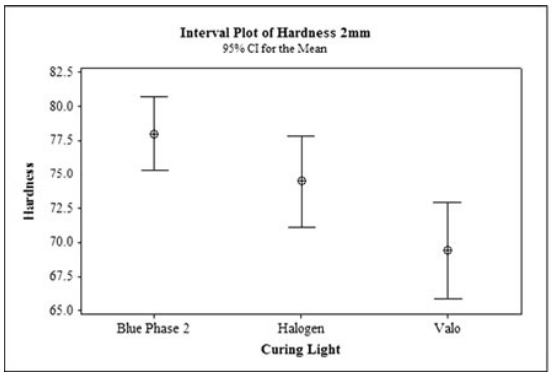
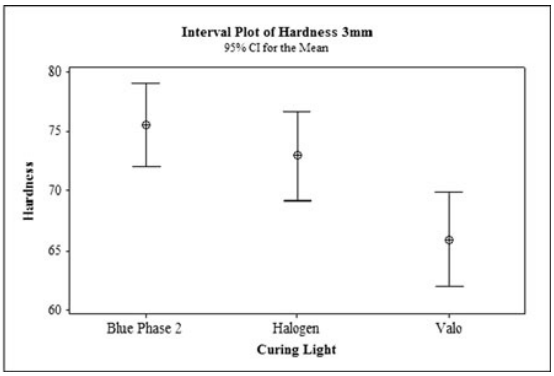
Objective: The aim of this *in vitro* study was to assess the correlation between different nanofilled composites and polywave multiLED curing lamps. The hypothesis is that polywave multiLED lights increase hardness than a halogen light.
Methods: A non-carious molar tooth, extracted for periodontal reasons, was selected. Crown was horizontally sectioned 2-mm above the CEJ. A 3×4-mm class I cavity was prepared in order to obtain a "tooth mould". Four resin composites containing different photoinitiators (Venus Pearl-Heraeus Kulzer, Filtek Supreme XTE-3 M ESPE, Estelite-Tokuyama, Ceram X-Dentsply) were selected to prepare 2 mm- ($n=15$) and 3 mm-thick ($n=15$) composite discs using the tooth mould. Composites were cured with three curing lights (Valo-Ultradent, Bluephase G2-Ivoclar Vivadent, Swiss Master Light-EMS) at the same energy density (1400 mW). Composite discs were then submitted to Vickers hardness test, performing 8 measurements both on top and on bottom surface. To evaluate the effects of composite, curing light, surface (top vs bottom) and their influence on hardness, analysis of variance (ANOVA) was performed. Differences were considered statistically significant for $p<0.05$.
Results: Statistical analysis revealed that all factors significantly influenced composite hardness (table 1). A correlation between composites and curing lamps was confirmed, with BluePhase G2 and Halogen significantly better matching with the tested composites (Figure 1), independently from the composite thickness.

Table 1: Analysis of Variance for Hardness

	Thickness = 2		Thickness = 3	
Source	F	P	F	P
Composite	16.02	0.000	27.97	0.000
Curing light	17.99	0.000	23.89	0.000
Surface	1084.10	0.000	2088.17	0.000
Composite*curing light	37.27	0.000	24.37	0.000
Curing light*surface	88.43	0.000	6.56	0.001





Conclusion: The tested hypothesis was partially accepted since only Bluphase G2, probably because of its wider wavelength than Valo, produced significantly higher hardness values with all tested nanofilled composites, both with 2 mm- and 3 mm-thick samples.