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Influence of extended light exposure curing times on the degree of conversion of resin-based pit and fissure sealant materials

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Abstract Purpose: The aim of present study was to evaluate extended curing times on the degree of conversion (DC) of filled and unfilled resin-based materials used as pit and fissure sealants.

Materials and methods: The materials examined were a flowable composite (Filtek_ Z350 XT Flowable) and a pit and fissure sealant (Clinpro_ Sealant). Thirty disks of each material were prepared. The 30 made of the flowable composite were divided into three groups (n= 10 each) according to the three different curing times studied: 20 s (group 1), 40 s (group 2), and 60 s (group 3). Similarly, the 30 disks made of the pit and fissure sealant were divided into three groups (n= 10 each) according to the three different curing times: 20 s (group 4), 40 s (group 5), and 60 s (group 6). After polymerization, the disks were removed from the mold and stored in dry, lightproof containers in an incubator at 37 °C for 24 h. The DC was obtained using an Avatar 320 FTIR spectrometer. Then the data were analyzed using the Kruskal–Wallis test and the Fisher's least significant difference post hoc test for multiple comparisons (alpha = 0.05).

Results: DC values for the flowable composite (Filtek_ Z350 XT) were higher (p=0.002) than those for the pit and fissure sealant (Clinpro_ Sealant). Group 2 and group 5 showed significantly higher DC values than group 1 and group 4, respectively. There was no difference between groups 2 and 3 or between groups 5 and 6 (p= 2.93).

Conclusion: An extended curing time improves the DC to some extent for both materials.

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