

ABSTRACT

Characterization of a composite to three-dimensional (3D) printing reinforced with niobium

The digital workflow (“workflow”) consolidates an innovative modality in the health area. In Dentistry, recent research demonstrates a promising field of automated prototyping of dental restorations by 3D printing, although the biggest challenge in the scientific community is to reconcile three-dimensional technology with adequate dental materials. Thus, this research project aimed to evaluate the mechanical and optical properties of a resin composite for 3D printing with the addition of niobium oxyhydroxide (NbO₂OH) in different concentrations. This work involves a study factor (resin for 3D printing - Next Dent™ C&B). NbO₂OH was incorporated into the three-dimensional printed resin at different concentrations: 0% (corresponds to the material group without the addition of niobium oxyhydroxide, that is, the control group), 0.5% of niobium oxyhydroxide, 1%, 2.5 % and 5%. The study response variables were: flexural strength, color stability after artificial aging and modulus of elasticity. After data collection, statistical analysis was performed considering a significance level of 5%.

Keywords: Nanotechnology, Composite resin, Three-dimensional printing.