INTISARI

Fiber reinforced composite (FRC) sering dipakai dalam kedokteran gigi sebagai material gigi tiruan cekat (GTC). Penambahan jumlah lapisan *fiber* dalam pembuatan gigi tiruan cekat FRC akan meningkatkan kekuatan mekanis. Jenis *fiber* dipakai antara lain *polyethylene fiber* dan *quartz glass fiber.* Material gigi tiruan harus mampu menahan beban yang terjadi selama proses pengunyahan di dalam mulut. Tujuan penelitian ini adalah untuk mengetahui pengaruh jumlah lapisan dan jenis *fiber* pada material gigi tiruan cekat *fiber reinforced composite* terhadap kekuatan fleksural.

Sampel penelitian berupa FRC menggunakan *fiber* jenis *polyethylene* dan *quartz glass.* Matriks yang dipakai *flowable composite*. Ukuran sampel 2x2x25 mm (ISO 10477). Sampel dibagi dalam 4 kelompok perlakuan dan 1 kelompok kontrol. Kelompok 1, FRC dengan *fiber* jenis *polyethylene* 1 lapisan; kelompok 2, FRC dengan *fiber* jenis *polyethylene* 2 lapisan; kelompok 3, FRC dengan jenis *fiber* jenis *quartz glass* 1 lapisan; kelompok 4, FRC dengan jenis *fiber* jenis *quartz glass* 2 lapisan dan kelompok 5 resin komposit tanpa penambahan *fiber* sebagai kelompok kontrol. Pengujian kekuatan fleksural menggunakan prinsip *three point bending* dengan alat *Universal testing machine.* Data hasil penelitian dianalisa menggunakan ANAVA dua jalur.

Hasil uji statistik kekuatan fleksural berdasarkan jumlah lapisan *fiber* 1 lapis dan 2 lapis memiliki perbedaan yang signifikan lebih besar pada kelompok dengan jumlah 2 lapis *fiber.* Sementara berdasarkan jenis, kekuatan fleksural *fiber quarts glass* lebih tinggi dibandingkan *fiber polyethylene.* Kesimpulan penelitian ini adalah penambahan jumlah lapisan dan penggunaan jenis *quartz glass fiber* pada material gigi tiruan cekat *fiber reinforced composite* (FRC) dapat meningkatkan kekuatan fleksural.

Kata kunci: *polyethylene, quartz glass,* lapisan *fiber,* kekuatan fleksural.

ABSTRACT

Fiber reinforced composite (FRC) was often used in dentistry as a fixed denture (FPD) material. The addition of fiber layers in the manufacture of FRC would increase the mechanical strength. Types of fiber that were often used in dentistry include polyethylene fiber and glass fiber. Quartz glass fiber was one of glass fiber. Denture material must be able to withstand the load that occurs during the masticatory process in the mouth. The purpose of this study was to determine the effect of the number of layers and the type of fiber in fiber reinforced composite fixed denture material on flexural strength.

The research sample was FRC using polyethylene fiber and quartz glass. The matrix used was flowable composite. Sample size 2x2x25 mm (ISO 10477). The sampels were divided into 4 treatment groups and 1 control group. Group 1, FRC with 1 layer polyethylene type fiber; group 2, FRC with 2 layers polyethylene type fiber; group 3, FRC with 1 layer quartz glass fiber type; group 4, FRC with 2 layers quartz glass fiber type and group 5 composite resin without adding fiber as control group. Flexural strength testing uses the principle of three point bending with a Universal testing machine. The research data were analyzed using two-way ANOVA.

Statistical test results of flexural strength based on the number of fiber layers 1 layer and 2 layers have a significantly greater difference in the group with the number of 2 layers of fiber. Meanwhile, based on the type, the flexural strength of quartz glass fiber was higher than polyethylene fiber. The conclusion of this study was that the addition of the number of layers and the use of quartz glass fiber in fiber reinforced composite (FRC) fixed denture material able to increase flexural strength.

Keywords: polyethylene, quartz glass, fiber coating, flexural strength.