

# Pengaruh Durasi Penyinaran (Lightcure) Terhadap Kekerasan dan Depth Of Cure Resin Komposit Bulk-Fill = Influence of Different Exposure Time (Lightcure) on Microhardness and Depth Of Cure of Bulk-Fill Composite Resin

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## Abstrak

Latar belakang : Resin komposit bulkfill merupakan resin terbaru yang dapat direstorasi dengan kedalaman 4-5 mm dalam sekali penyinaran. Polimerisasi dipengaruhi oleh durasi penyinaran dan besaran irradiansi lightcuring untuk mendapatkan kekerasan permukaan dan depth of cure yang optimal. Tujuan: Penelitian ini bertujuan untuk mengetahui perbedaan nilai kekerasan resin komposit dan depth of cure resin komposit Tetric® N- Ceram bulk-fill yang disinari lightcure dengan durasi 5 detik, 10 detik dan 15 detik. Metode Penelitian: Dalam penelitian ini digunakan 24 spesimen resin komposit Tetric® N-Ceram bulk-fill berbentuk silinder dengan ukuran diameter 6 mm dan tebal 4 mm. Selambar mylar strip diletakkan diatas permukaan resin komposit sebelum dilakukan proses curing. Polimerisasi dilakukan menggunakan Light Curing Unit (LED DBA iLed) selama 5 detik, 10 detik dan 15 detik dengan irradiansi 1100 mW/cm<sup>2</sup>. Setelah polimerisasi, spesimen direndam dalam akuades pada suhu 37°C selama 24 jam. Spesimen dibagi menjadi tiga kelompok (n=8) yaitu; kelompok resin komposit dengan penyinaran 5 detik, penyinaran 10 detik dan penyinaran 15 detik. Spesimen diuji menggunakan HMV-G Series Micro Vickers Hardness Tester (Shimadzu, Jepang) dengan beban 100 gram selama 10 detik untuk mendapatkan nilai kekerasan. Data dianalisis dengan uji statistik Kruskal Wallis dan Post-Hoc Mann Whitney. Hasil Penelitian: Hasil uji statistik menunjukkan kenaikan bermakna nilai kekerasan permukaan dan depth of cure pada resin komposit Tetric® N-Ceram bulk-fill. Nilai kekerasan dan depth of cure tertinggi terlihat pada resin komposit Tetric® N-Ceram bulk-fill pada kelompok penyinaran 15 detik, yaitu sebesar  $41,61 \pm 1,25$  KHN dan  $72,71 \pm 1,88$ . Kesimpulan: Disimpulkan bahwa semakin bertambah durasi penyinaran lightcure yang disinari, semakin bertambah nilai kekerasan permukaan dan depth of cure resin komposit Tetric® N-Ceram bulk-fill.

.....Background : Bulkfill composite resin is the newest resin that can be restored to a depth of 4-5 mm in one step. Polymerization is determined by the irradiation time and the amount of light curing irradiance to obtain optimal microhardness and depth of cure. Objective: The aim of this study was to determine the difference in the value of the microhardness of the composite resin and the depth of cure of the Tetric® N-Ceram bulk- fill composite resin irradiated by lightcure with a duration of 5 seconds, 10 seconds and 15 seconds. Method: Twenty four specimens of Tetric® N-Ceram bulk-fill Composite Resin were used in this study. All materials were prepared into disk-shaped specimens of 6 mm in diameter and 4 mm in thickness. A piece of mylar strip was placed on the top of the specimens just before the polymerization.. Polymerization was carried out using a Light Curing Unit (LED DBA iLed) for 5 seconds, 10 seconds and 15 seconds with an irradiance of 1100 mW/cm<sup>2</sup>. After polymerization, specimens were immersed in 37 aquadest solution for 24 hours. Specimens were divided into three groups (n=8) that is; composite resin group with 5 seconds of irradiation, 10 seconds of irradiation and 15 seconds of irradiation. Specimens were tested with HMV-G Series Micro Vickers Hardness Tester (Shimadzu, Jepang) with 100 gram indentation in 10 seconds. Data were analyzed using Kruskal Wallis and Post-Hoc Mann Whitney to assess the significant

differences among groups Result: The results of statistical tests showed a significant increase in the value of microhardness and depth of cure on Tetric® N-Ceram bulk-fill composite resin. The highest microhardness and depth of cure values were seen in the Tetric® N-Ceram bulk-fill composite resin in the 15 second irradiation group, namely  $41.61 \pm 1.25$  KHN and  $72.71 \pm 1.88$ . Conclusion: It was concluded that the longer the duration of irradiation of the irradiated lightcure, the higher the microhardness value and depth of cure of the Tetric® N-Ceram bulk-fill composite resin.