**DETERMINATION OF DENTAL AEROSOLS WITH AND WITHOUT THE USE OF AIR PURIFIERS**

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**ABSTRACT**

The purpose of this study was to measure the number and concentration of airborne particulates occurring in a dental clinic while performing dental procedures, with and without the simultaneous use of air purifier systems and a central ventilation system. Results showed that the use of air purifiers during dental work can reduce concentrations of particulate matter. The initial background concentrations of airborne particulates recorded during dental procedures, i.e., grinding of natural teeth and metals, without the use of air purifier systems and with closed windows, reduced by 68% for ΡΜ10, 77% for ΡΜ2.5 and 81% for ΡΜ1 when the same procedures were carried out with the simultaneous use of air purifying systems. In addition, measurements taken during patient treatment showed that an operating central ventilation system contributes to the reduction of airborne particles by a significant 94% for ΡΜ10, 94% for ΡΜ2.5 and 88% for ΡΜ1 compared to dental procedures performed without the simultaneous use of air purifiers. Air purifying systems were also observed to contribute to the further reduction of airborne particulates when dental procedures were performed in combination with an operating central ventilation system. The majority of particles captured had diameters of 0.25-0.30 μm, 0.5 μm, and 1.0-4.0 μm, while particles with diameters of >5.0 μm were the least commonly observed in all experiments. Finally, a statistically significant difference between concentrations of particulate matter was recorded during dental procedures carried out with and without the simultaneous operation of air purifiers and central ventilation system increasing the risk of SARS-CoV-2 virus contamination in dental clinics due to the aerosols emitted by the use of common dental instruments during standard treatments.

**KEYWORDS:** Particulate matter, dental procedures, air purifiers, SARS-CoV-2