

Abstract:**Title: Assessment of heavy metals in the inside air of Ardabil city's dental clinics in 2021**

Introduction: Dental instruments and materials produce significant levels of heavy metals in the air. However, there are few studies on the amount of heavy metals in the air inside dental clinics. To fill the study gap in this field, study investigate the amount of heavy metals in the air inside the dental clinics of Ardabil in 2021.

Materials and Methods: In this cross-sectional study, the statistical population included all 36 dental clinics in Ardabil. After sampling and collecting samples on a PTFE filter and transferring it to the laboratory, heavy metals were extracted from the filters. ICP-MS was used for quantitative and qualitative analysis of heavy metals in this study. After collecting data, all data were analyzed by using the relevant statistical methods using SPSS software version 22. Statistical analysis was performed using independent t-test, one-way analysis of variance. One-sample t-test was also used to compare with the standards.

Results: The results showed that in the air inside Ardabil dental clinics, the levels of cadmium, chromium, manganese, nickel, lead and zinc were normal; But the amount of copper, iron and mercury was higher than the standard. The amount of all heavy metals except mercury and zinc were significant ($P < 0.05$). The amount of nickel in the ground floor, the amount of mercury based on the number of windows in the area of 100 to 150 meters, the amount of copper based on the type of natural ventilation and the amount of zinc were significant in Minamel and Softy8 amalgamators and more than other cases ($P < 0.05$). Other variables had no effect on the amount of heavy metals. The results also showed that the carcinogenic risk of chromium and nickel, mercury and manganese in the air inside the dental clinics of Ardabil is acceptable by inhalation and there is no significant carcinogenic risk.

Conclusion: Since the amount of copper, iron and mercury in the air inside Ardabil dental clinics is higher than the standard, it is recommended that more supervision be done in Ardabil dental clinics and clinics be inspected periodically.

Keywords: Dentistry, Heavy Metals, Amalgam.