Investigation of Fluoride Concentration in Rural Drinking Water Resources of Bardaskan County Using Geographic Information System (GIS) in 2014

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Abstract

Background and aim: The concentration of fluoride in drinking water resources is very important in peoples' health issue. One of the main resources of fluoride intake for people is drinking water. Therefore, this study aimed to determine the fluoride concentration in rural drinking water resources of Bardaskan County using geographic information system.

Methods: In this descriptive/cross-sectional study, the samples were collected from 30 drinking water resources in Bardaskan in 1393 and fluoride concentration was determined. In order to interpolation of fluoride concentration, the Kriging, Radial Basis Functions, Local Polynomial Interpolation and Global Polynomial Interpolation methods were used. The best interpolation method was determined RMSE. The zoning maps were prepared using geostatistical methods in GIS software.

Results: The mean concentration of fluoride in studied resources was 0.562 ± 0.058 mg/L. The minimum and maximum concentrations of fluoride were 0.06 and 1.43 mg/L, respectively. According to the zoning maps, the fluoride concentration was higher in the center of studied area than the overall mean. The simple Kriging method with RMSE of 0.16916 was the best method for zoning of fluoride in the studied area.

Conclusion: Based on the results of present study, the fluoride concentration in drinking water resources is in desirable level and there is no concern regarding the fluoride concentration in drinking water.

Keywords: Fluoride concentration, drinking water resources, zoning of fluoride concentration