

# FLUORIDE IN DRINKING WATER AND URINE: A CROSS-SECTIONAL STUDY AMONG SECONDARY SCHOOL CHILDREN IN KUALA KUBU BHARU, SELANGOR, MALAYSIA

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## ABSTRACT

**Background:** This study aimed to determine the levels of fluoride in drinking water and levels of urinary fluoride, to determine whether fluoride in both drinking water and urine were under the acceptable range stated by NDWQS and NIOSH Method 8308 respectively, to determine any significant difference in urinary fluoride between gender, and to determine the relationship between fluoride levels in drinking water and urinary fluoride among study subjects.

**Subjects and Methods:** A cross-sectional study was conducted in Kuala Kubu Bharu, Selangor, Malaysia. A sample of secondary school children aged 14-years-old at a selected school were selected based on several criteria, including living at least 6 years on the same area and not having any health problems. Then a briefing was given to selected study subjects before distribution of a set of questionnaire were made. After obtaining parents' permission, a set of high-density polyethylene bottle (HDPE) and urine collection container was given to study subjects for drinking water and urine samples collection for 2 consecutive days. Both samples were analyzed using a HACH Brand Direct Reading Spectrophotometer model DR/ 1900 by Method 8029 which was accepted by the US EPA for reporting of drinking water and wastewater analysis purposes.

**Results:** Fluoride levels in drinking water ranged between 0.41 to 0.59 ppm with a median of 0.46 (SD=0.04). Fluoride level in urine ranged between 0.45 to 2.29 ppm with a mean 1.48 (SD=0.43). There was no significant difference in urinary fluoride between genders. Also, there was no significant relationship between fluoride levels in drinking water and urinary fluoride levels among study subjects. The median value fluoride in drinking water obtained was 0.46 which was still in the range of NDWQS standards. Urinary fluoride was within the range stated by NIOSH.

**Conclusion:** Levels of fluoride in both drinking water and urine in Kuala Kubu Bharu, Selangor, Malaysia, were within the acceptable limit.

**Keywords:** fluoride, drinking water, urinary fluoride, secondary school children, Kuala Kubu Bharu

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