FLUORIDE LEVELS IN BOREHOLE WATER AND COMMUNITY AWARENESS OF DENTAL FLUOROSIS IN CENTRAL DIVISION, KAJIADO DISTRICT, KENYA

BY

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ABSTRACT

Background: The presence of fluoride in water is one of the major dental public health significance. Studies by Kenya Red Cross have revealed that over 70% of the population in Kajiado does not have access to safe water. The general population is exposed to fluorides through consumption of drinking water, food and dentifrices. Populations living in areas with naturally high fluoride levels in water are at a greater risk of being exposed to large amounts of fluorides. Low levels of fluoride intake help to prevent dental caries. Ingestion of excess fluoride, can cause fluorosis, which affects the teeth and bones. Moderate amounts lead to dental effects, but long-term ingestion of large amounts can lead to potentially severe skeletal problems.

Objectives: To determine exposure to fluoride in drinking water and assess the level of awareness of dental fluorosis among the inhabitants of Central Division of Kajiado District. The specific objectives were; to determine levels of fluorides in drinking water sourced from boreholes, to estimate the daily intake of fluoride from drinking water sourced from boreholes in Central Division of Kajiado District and to determine level of awareness of the community on dental fluorosis.

Research design: A cross sectional study.

Study area: The study was conducted in Central Division of Kajiado District.

Sampling techniques: Simple random sampling was used to identify study locations within Central Division of Kajiado District from which boreholes for this study were selected. Systematic random sampling was used to identify 384 study respondents consuming water sourced from boreholes under this study.

Methods: Colorimetric technique was used to determine the fluoride levels in water samples. Interviewer administered questionnaires were used to gather information from study participants. Data was summarized in form of tables and charts. Data analysis means and chi-square was conducted using SPSS version 11.5.

Results and Discussion: A total of 384 participants took part in the study of which 58.3% (n=224) were females while 41.7% (n=160) were males. The fluoride levels in the sampled water ranged from 0.8mg/L to 5.2mg/L with a mean of 2.7294 mg/L and a standard deviation of 1.4812. The study results indicate that 72.1% (n=13) of the water samples analyzed, had fluoride levels higher than the recommended maximum permissible WHO level of 1.5mg/L. The relative risk (OR) of development of brown teeth due to consumption of water with fluoride levels higher than 1.5mg/L was 1.333 with 95% C.I (1.168 - 1.523). The Pearson chi square statistic p value =0.000. The study participants who had heard of dental fluorosis were 36% (n=139) while only 7.6% (n=29) of study respondents were aware that high fluoride levels in water is a potential risk of dental fluorosis to regular consumers of such water.

Conclusions: This study provides an overview of the fluoride content in drinking water and the extent of human exposure to different levels of fluoride through drinking water sourced from various boreholes in Central Division of Kajiado District. Exposure analysis revealed that majority of people in the study area 72.1% (n=277) consumed water with fluoride content above the WHO maximum permitted level of 1.5 mg/L.