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Water quality and health risk of public drinking water sources: a study of filtration plants installed in Rawalpindi and Islamabad, Pakistan

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ABSTRACT

Safe drinking water is the basic human right in any region of the world. With increasing population and anthropogenic activities, this basic entity is in danger. This situation is more worsen in developing countries where no monitoring and maintenance is being followed. The present study is based on the monitoring of filtration plants for drinking water in two populated cities of Pakistan to determine the water quality status. Drinking water samples from Rawalpindi (n = 53) and Islamabad (n = 32) were taken from filtration plants installed by Capital Development Authority (CDA) in Islamabad and Water and Sanitation Agency (WASA) in Rawalpindi Pakistan. Physio-chemical parameters metals were analyzed using the standard procedures and multivariate indices and health risks were calculated. The results showed that electrical conductivity, alkalinity, and arsenic were above the permissible limit of the World Health Organization. 32 out of 53 samples in Rawalpindi while 26 out of 32 samples in Islamabad were found under poor water quality category with water quality index (WQI) > 100. Hazard index of arsenic was found <1 in adults (9.80E+01 and 7.03E+01) and children (1.48E+02 and 1.06E+02) at Rawalpindi and Islamabad respectively. Especially, children are found more prone to health hazards. Microbiological (bacteriological) components were incorporated to check the health risks due to water contamination. Proper management should be taken for the sustainability of limited underground water. This study will provide basic information regarding water quality in two large cities in a developing country of Pakistan.

Keywords: Health risk; Rawalpindi and Islamabad; Water quality

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