Assessment of Quality of Drinking Water Sources and Health Implications on Students in Second Cycle Schools in Aburi, Ghana

MARY ARABA QUAYSON

2012

ABSTRACT

The study assessed the quality of drinking water sources used in three selected second cycle schools in Aburi and the health implications on the students. The schools are Aburi Girls Senior High School, Adonten Senior High School and Presbyterian Senior High Technical School. These schools depend on different sources of water for drinking, washing and other domestic purposes. The sources were boreholes and well waters stored in different reservoirs such as concrete, metal and plastic tanks. The students also depended on packaged treated water, mostly the sachet types. Monthly water samples from the borehole, storage tanks and well were analysed over a period of six months while sachet water samples were analyzed for three months. The water samples from these sources were analyzed for various water quality parameters following standard methods including pH (pH meter), electrical conductivity (Cyberscan PC 510 conductivity meter), turbidity (Nephelometric method), total iron (Atomic Absorption Spectrometer), phosphate (stannous chloride method), total coliform, faecal coliform, *Escherichia coli* (membrane filtration method) and total heterotrophic bacteria (pour plate). The socio-economic data was obtained from a sample of student population in each school using structured interviews. The study revealed that, most of the mean levels of physico-chemical and bacteriological parameters of the water samples studied were within the WHO guidelines and Ghana standards recommended for drinking water. Few of the samples, however had low levels registered for pH and high levels of phosphate, total iron, TC, FC, *E. Coli* and THB. The pH of most water samples recorded between 4.47 and 6.35 pH unit which fell below the WHO guidelines and Ghana standards of 6.5-8.5 pH unit. Samples AGMR, ASWL and PSCR recorded values (6.78-7.03 pH unit) which were within the recommended limits. The mean phosphate values registered for all the water samples were between 0.11 ± 0.11 to 0.39 ± 0.32 mg/l which were above the WHO guideline of 0.01 mg/l. The mean total iron concentrations registered were low except with Adonten School Borehole (ASBH) that

registered 0.48 ± 1.11 mg/l as against drinking water quality standards of 0.3 mg/l. The mean total coliform levels in the water samples varied between l.67 ± l.67 cfull 00 ml and 970.83 ± 505.93 cfull OO ml as against the Ghana standards of 0 cfull 00 mi. Faecal coliform concentrations in water samples were all high except Adonten School Concrete Reservoir (ASCR) which recorded 0 cfull 00 mi. Also, there was presence of *Escherichia coli* in all the water samples with the exception of ASCR and Presbyterian School Borehole (PSBH). Total heterotrophic bacteria levels in water samples ranged between 4.33 ± 3.67 cfu/ml to 1237.80 ± 691.38 cfu/ml as against Ghana standards of 500 cfu/ml. However, Tropicool and Dowell sachet drinking water recorded high levels of total coliform bacteria and total heterotrophic bacteria (THB).The water samples from borehole, reservoirs, well, Tropicool sachet drinking water and Dowell sachet drinking water used by students in these schools are considered unsuitable for drinking as far as pH, phosphate, total iron and bacteriological qualities are concerned. These findings indicate serious potential health threats on the students who continue to consume these different sources of water available in their schools. The perception of students on water quality, hygiene and sanitation showed that students had little knowledge on implications of these issues on their health. The study recommends that, immediate action should be taken to establish routine monitoring of water quality, regular inspections and maintenance of the water storage facilities, treatment of water before use, and education on the need for proper sanitary conditions and use of water in the schools.

Supervisors

Dr. F.E.K. Nunoo

Dr. J.A.Ampofo