

The effect of a water-hygiene educational programme on the microbiological quality of container-stored water in households

NP Nala^{1*}, P Jagals^{1*} and G Joubert²

¹ Unit for Water and Health; Technikon Free State, Private Bag X20539, Bloemfontein 9300, South Africa
² Department of Biostatistics, University of the Free State, PO Box 339(G31), Bloemfontein 9300, South Africa

Abstract

This study investigated whether a water-handling hygiene education programme could improve the health-related microbiological quality of container water stored and used in households in a dense urban settlement in the Free State Province. Previous studies in the area indicated that stored container water became contaminated during the process of fetching from communal standpipes and then storing and handling the water at home, which exposed the study population to a potential risk of microbiological infection. A water-hygiene education programme was implemented together with a health-related microbiological water quality assessment programme. Members of selected households participated in a series of domestic water-handling hygiene education training sessions over a period of eight months and the quality of their stored water monitored for improvement in tandem over the same period. The results were compared to those of similar tests done during previous studies in the same area. Turbidity, heterotrophic bacteria numbers and total coliform bacteria were used as indicators of general microbial water quality while *E. coli* bacteria were used to indicate faecal pollution. While the results generally reflected significant improvements for all the indicators from the previous studies, a potential risk of infection was still indicated for consumers. Based on education programme attendance profile, the study sample was divided into **frequent**, **intermittent** and **never** groups. No significant changes were found in water quality between the three groups, even though the **frequent** group attended most of the training sessions. This implies that the programme did not have a particular influence on any one group. Container-stored water was still being contaminated in the domestic environment despite the water-handling hygiene education programme. An improved hygiene-education programme appears to be needed to change deep-rooted inherent behaviours such as hand-washing prior to water handling as well as proper protection of container-stored water from environmental contamination.

Keywords: Water-hygiene education, container-stored water quality, turbidity, heterotrophic bacteria, total coliforms, *E. coli*, infection risk

Introduction

In many developing areas of South Africa, microbiologically safe water is supplied to communities at communal taps. Studies have shown that collecting water from these taps, as well as storing it in, and handling it from containers at home cause quality deterioration to such an extent that the water poses potential risks of infection to consumers (Jagals et al., 1999; Medical Research Council, 1999). During storage and handling at home, people contaminate water with pathogenic micro-organisms (Pinfold, 1990). To ensure that consumers get maximum health benefit from water supply improvement programmes, domestic water-storage and -handling practices must therefore be addressed (Cartwright, 1998).

One way to improve water-handling practices is by promoting water-handling hygiene (Coulson, 2000). A strong pillar of hygiene promotion is hygiene education (International Water and Sanitation Centre, 2001). Hygiene education aims to change people's behaviour into positive hygiene practices which, in the context of domestic water hygiene, includes regular hand-washing and proper collection, storage and handling of water (Kaltenthaler and Drasar, 1996; Coulson, 2000). In other words, where people have to collect water from communal taps, sound hygiene practices

should be taught and maintained to ensure that the way people store and use water at home, does not endanger their health (Mintz et al., 1995). The aim of this study was therefore to determine whether teaching people proper domestic stored-water handling as well as general container hygiene would significantly improve poor health-related quality of their household water.

During this study, members of a community were involved in an intense short-term education programme on domestic water hygiene practices, and their container-stored water quality assessed to determine whether the programme would bring about positive changes in the water quality. These members were selected on the strength of earlier participation in related studies done in the same area on general domestic hygiene (Theron, 2000) as well as the microbiological quality of stored water assessed by Bokako (2000).

Methodology

The study consisted of two components, that is, a water-hygiene education programme and a health-related microbiological water quality assessment programme. The education programme involved the selected group of household members in learning-actions to improve their domestic water-handling practices. The water-quality programme measured the effect of the educational hygiene programme had on the quality of stored water in the participant households.

The study was conducted in a residential suburb of Botshabelo in the Free State Province, South Africa. The area had approximately 3 100 households (Theron, 2000). People access the mu-

* To whom all correspondence should be addressed.

Current address: Water and Health Research; Technikon Witwatersrand, PO Box 17011, Doornfontein, 2028

☎ +2711 406 2806; fax: +2711 406 2582; e-mail: Jagals@mail.twr.ac.za
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