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Research Article

Level of Community Satisfactions from One Point of Water Source for Domestic Consumption in Gambia

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Abstract

This qualitative research is based on assessing the satisfaction derived by the consumers from the domestic drinking water in the Gambia. Three (3) highly densely populated neighborhoods were selected on the basis of sharing the same waterline; FajiKunda, Tallinding, and Ebo Town. The goal of the study is to compare and contrast the comments and opinions of the consumers within the selected communities or neighborhoods. It is aimed to quantify the satisfaction derived by the users of this water and for that, a qualitative study is deemed necessary to be conducted. The mode of conducting this research involves questionnaire and interviews; among the wards selected, 50 households and this enable 150 sample sizes for this qualitative study. The overall results obtained from this study are positive. Among the respondents, 137 claimed to benefit from clean and safe water from the sources. The organoleptic properties that include taste, color and the odor of the domestic waters are satisfactory. There are no concepts or suspicion that the drinking water is any way related to stomach disorders. Although majority store drinking water in the fridges, still some use jars, gallons, and buckets. The 98% of positive response on the clean and reliability of the domestic water supplies to the selected communities is enough to conclude that the national water supplier is always putting standards before anything. And to this note, the public is assured to report immediately upon encountering any abnormalities from the sources of the water. A recommendation for the consumers to be highly selective as to the storage facilities used in keeping the water fit for both drinking and cooking and the active participation of water providers in emergency cases and putting forward standards.

Keywords: Domestic Water; Water Contaminants; Consumer Satisfaction and Organoleptic Properties

Introduction

Water is a basic need for life. It is so essential that 95% of cytoplasm in human cells consist of water. Water is found to play significant functions in the body such as helping in digestion of food and maintenance of body temperature in relation to its external environment (homeostasis). The different roles played by water in the lives of people are so vast that it cannot be exhausted in this paper.

In the Gambia, the majority of the people claimed that the water used for drinking is found to be among the best in Africa. This can't be easily argued since the Gambia didn't experience any other outbreaks of water related diseases after the 1896 cholera epidemic in Banjul which affected many poor people especially those from the Moka or Mocan town which later came to be known as Half-Dies [1]. Due to poor practice of water and sanitation, (WATSAN)].

This research is in accordance with the guidelines developed by the School of medicine and the allied Science University of the Gambia under the Department of Public Health and Environmental Science. On quality practice of water and sanitation, the focus is on health concerns and it aims to check the quality of the water consumed by those communities a far as health and quantifying the concept among the consumers [1].

The Water Quality laboratory lab located in Abuko, a subunit under the Department of Water Resources established in the 1970s with its main purpose of ensuring safe water for public water consumption. The Laboratories responsible for checking the quality of water harvest from boreholes, taps, and Hand- wells makes use of three main parameters to check the quality of waters in urban and rural centers of The Gambia. These parameters are physiochemical, chemical, and microbiological parameters [1].

Laboratories are made for diagnostic roles in case of epidemic or sporadic cases, while primary prevention of sanitation i.e. drinking water does not mix with fecal matter are vital in this study. According to UN Water, the benefits that can be derived from drinking water depend on how hygienic the water will be. And thus, considering the catchment areas is crucial. On occasions, pipes and water supply materials are either busted and this can enable pathogenic or toxic substances to find their ways in the water system and hence causing disorders among the consumers. These pipes are always seen leaking in FajiKunda, Tallinding and Ebo Town.

Types of water exposure

The commonest distinction regarding water exposure is between water that is used for drinking and those used for recreational purposes. For some surveys, the disease is classified based on to water supply involved is a public water system, usually regulated by national legislature and local by-laws, or other types of supply, such as private wells or untreated water sources. A detailed classification requires specification of the type of water sources, such as groundwater or surface water. For water-contact diseases, the classification includes freshwater and marine waters. The waterborne microbiological disease related to consumption of pathogens consumed in water; most due to human or animal fecal contamination of water drinking. For waterborne chemical disease and water hygiene diseases, whose incidence, prevalence or severity can be reduced by using safe (clean) water to improve personal and domestic hygiene. Any water used for washing/ personal hygiene can contact diseases caused by skin contact with pathogen infested of water or with chemicals [5].

Literature Review

The study conducted by Bajinka., *et al*. (2017) on the drinking water quality shows that waters from the taps are cleaner and safer than those drawn from jars and other storage facilities. Water is drawn from taps or wells and transport to the storage facilities with the use of plastic containers that might be left open in the air when transporting. All the chemical parameters which, includes; chlorine, Nitrate, Nitrite, Alkalinity, Lead, Copper, Iron, and some properties like hardness and pesticides were all tested and exceptional standards of these parameters as in line with Environment Protection Agency (EPA) were found. While the samples from the tap water were free of bacteria (bacteria negative), positive culture that was confirmed as opportunistic pathogens *Enterobacter aerogenes, Enterobacter cloacae* and *Citrobacter freundii* by analytical profile index (API). Chlorine ruptures cell nuclear content and thereby reducing the threat of all waterborne pathogens. However, Cryptosporidium and Mycobacteria have developed resistance to Chlorine. Also, Chlorine can neutralize the foul taste and odors and render the water optimum organoleptic properties and inhibit the growth of mold and algae and may oxidize inorganic chemicals like; iron, manganese [2,3].

As part of the 8-millennium development goals (MDGs), the United Nation's opt for the availability of safe and reliable water to all. And this goal inexplicable as the preservation of domestic water is life savings [6]. Although their numerous standards that are relative to countries, more developed countries share similar standards, world health organization (WHO) should set references in formulating standards for any countries within the transition economy [9]. Since it came to light by the water scientist that the use of old or conventional approaches to ensuring the safety water is not enough, the use of molecular methods should be implemented to add for more sensitive, specific and reliable results from testing our water sources [5,7]. Gambian has their own old methods of ensure safe water, which needs to build in synergistically partnership with, sustainable goals, at all levels, in order to empower the community, hence sustainable.

Assessing suitability of water for drinking

Physical conditions of water for drinking

This parameter is done on an on-site or in-situ collection of water samples. The sampling apparatus such as PH meter, EC mete (electric conductivity), Turbidity meter, Residual chlorine meter and sampling bottles for both chemistry and microbiology are arranged before going to the field. Prior to the field PH meter and EC meter is calibrated for accurate data generation. PH is calibrated using Buffer 4, 7 and 10. While EC meter is used with EC standard solution. The purpose of calibration is to obtain accuracy before going for sampling. In this parameter, the color, saline, and odor are tested along the water with sanitary and hygienic measures [11].

Chemical parameters of water

This is the second parameter used for testing the quality of water. It comprises of using the spectrophotometer to do chemical analysis on certain elements such as ammonia, phosphate, sulfate, nitrate, nitrite, copper, fluorine, manganese, sodium etc. This is done with added indicators based on the sample volume of the spectrophotometer. These indicators are referred to as reagents that help to indicate their concentration in the water composition. It is applicable for all sources of water such as rainwater, fresh water etc.

Treatment of water for domestic uses

In treating water for the 'fit for purpose', guidelines that serve as regulations are set to be followed. If one of the factors deviates, it could be the detriment to health. For example, the lower limits are the chlorine that is added to disinfect the water and microbes or harmful substances that can pose a health threat [9].

It is important as well to which treatment method to be chosen; for example in the case of Reverse Osmosis, the inadequate calcium and magnesium in the water mean the depriving of important elements [9].

Methodology

The procedures used in conducting and gathering information on this research were through questionnaire and interviews. Firstly, compounds were identified randomly in different wards within the three communities. In each community, fifty (50) participants were chosen to participate in the research. Secondly, the purpose of the research was started and explained to the participants in each compound before questionnaires were given to them. The research questionnaires were filled through personal interviews with participants in each compound and later on, the questionnaires were given to them to verify whether it tallied with the information they have given. And finally, the questionnaires were taken back from them and tendered for each particular community. The date were presented using table to summarize the response from the participants. Based on The University of The Gambian Research Scheme, an ethical approval was sought.

Results and Discussion

The research has shown that the three communities (FajiKunda, Tallinding, and Ebo Town) unanimously agreed and are truly satisfied with the quality of water being supplied to them since they started having accessed to water supply. The table below represents the results obtained in each community.

Communities	Sources of water supply	Organoleptic	Particles	Stomach disorders in relation to water	Storages
Faji Kunda	NAWEC, Boreholes.	Satisfactory	No particles	No disorders	Jars, bottles, gallons, plastic buckets
Tallinding	NAWEC	Satisfactory	No particles	No disorders	Jars, bottles, gallons, plastic buckets.
Ebo Town	NAWEC	Satisfactory	No particles	No disorders	Gallons, bottles, Jars, plastic buckets

Table 1: Response from the Three Communities on Domestic Drinking Water.

Despite different storage systems used by individuals in each community, there isn't a single participant shown in the research that an individual had or is suffering from stomach disorders in relation to the water used for drinking. This is obvious because the organoleptic of the water is found to be consistent with criteria used for harvesting public water for consumptions.

In family history of stomach disorders, there were few participants approximately 6.70% of the total especially those in FajiKunda who complained of stomach disorders. They clearly state, those ill-health states were not a result of water-borne diseases but other factors contributed which triggered the conditions.

Some of the participants also made mentioned of infrequent stomach disorders in their children. They believed that those situations were not related to water but rather a common thing amongst children especially when they are experiencing deworming. These comments were based on beliefs and not on general medical diagnoses of children which concurred with their statements. None of the participants produce a piece of evidence to support their arguments during the interviews.

A quite number of people also complaint some particles found in water when there is a shortage of water for a long period of time. This normally appears when the tap opens newly after the experience of a shortage of water for a long period of time, some black and yellowish particles are coming out immediately as the tap opens. Majority of the people in the community believed that this happened when the suppliers are cleaning the pipes.

Certain places such as Ebo Town which rely only on tap (NAWEC) water for drinking due to the type of soil found in their environment and some areas in their vicinity explicitly agreed to the results found in the other communities.

Conclusions

Since 98% of the people within communities agreed that their domestic drinking water is safe for drinking. We can conclude that the sources of water supplies are treated with standard techniques which help to prevent water-borne diseases amongst the people in the communities. This is a good result so far as health is a concern. The result obtained has also proved that the people are also taking proper precautions on the types of storage systems they are using for water. The result could have proven negative if the storages are not kept clean or put to good hygienic measures or conditions.

The issues regarding family his with relation to stomach disorders not on the water to be specific has proved that 6.70% of the people who are alive and those who are not inclusively suffered from some of these conditions. The Cause of some of these conditions isn't known and yet exists among some of the people living in the communities.

Recommendations

The study recommends that while the consumers show satisfaction from the source water for domestic uses, the water supplying company should as well do periodical monitoring of the standards laid by Environmental Protective Agency (EPA) and should respond to the urgent needs to fix the underground pipes that are normally seen leaking.

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