ORIGINAL RESEARCH

Access to Safe Drinking Water and Sanitation Facilities: A Case Study of Lagos Mainland Local Government Area, Lagos, Nigeria

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ABSTRACT

Background: Access to safe drinking water will prevent water borne diseases, disability and death**.** Clean water and sanitation are crucial to healthy living. Access to good drinking water is indicated by safe water sources.
Objectives: The study was conducted to determine access to safe drinking water and sanitation facilities amongst residents of Lagos Mainland Local Government Area (LGA), Lagos.
Methods: A cross-sectional descriptive study was carried out using mainly interviewer administered questionnaire to 381 participants of not less than 18 years which focused on questions on source of drinking water, sanitation facility and incidence of water borne diseases.
Results: Response rate was 94.5%. Majority of the respondents (40%) were between 38-47 years old. Half of the respondents relied on sachet water as source of drinking water while 5% from pipe water in the compound. Majority of the respondents' households (85%) had access to water within a distance of about 100 metres or less and within 15 minutes or less. About 60% of the household had government piped water into their compound. Majority of the households (80%) had flush toilets while 20% had improved pit latrine. Most of the respondents (80%) were aware that disease can be caused by unsafe drinking water. More than half (55.56%) of the households have not treated water related diseases in the last two months.
Conclusion: The surveyed households had close access to safe drinking water. Sachet water was the main source of drinking water. The sanitation facilities in the studied area were adequate for healthy living and good quality of life.

Keywords: Access to water, Water borne diseases, Sanitation, Toilet facilities, Lagos Mainland LGA, Descriptive study

INTRODUCTION

Access to water is broadly defined as the availability of at least 20 litres of water per person per day from a source within one kilometre of the user's dwelling[1]. Drinking water, also known as potable water or improved drinking water, is water safe enough for drinking and food preparation[2]. Access to good drinking water is indicated by safe water sources. Improved drinking water sources include household connection, public standpipe, borehole connection, protected dug well, protected

spring and rainwater collection. Sources that do not encourage improved drinking water to the same extent as previously mentioned include unprotected wells, unprotected springs, rivers or ponds, vendor-provided water, bottled water (consequential of limitations in quantity, not quality of water), and tanker truck water[3]. Access to safe sanitation system comes hand in hand with access to improved sanitation facilities for excreta, such as connection to public sewer, connection to septic system or a pit latrine with a slab or water seal[3]. Globally, in 2012, 89 % of people had access to water suitable for drinking but this reduced to 74% in 2020[2,4]. Literature shows that access to an improved water source stagnated at 47% from 1990 to 2006 but increased to 54% in 2010. In urban areas, access to an improved water source decreased from 80% to 65% in 2006 but recovered to 74% in 2010[2]. Nearly 4 billion people had access to tap water while another 2.3 billion had access to wells or public taps. At least 2 billion people still use an unsafe drinking water source which may be contaminated by feces[4]. This can result in infectious diarrhoea such as cholera and typhoid among others[4,5]. According to the World Bank, 88% of disease in the developing world is caused by unsafe drinking water. Diseases from microbial pollution may be the result of the contamination of drinking water[6]. Contaminated water is estimated to result in more than half a million deaths per year[4]. Clean water supply - in particular water that is not polluted with faecal matter from lack of sanitation - is the single most important determinant of public health. Destruction of water supply and/or sanitation infrastructure after major catastrophes (earthquakes, floods, war, etc.) poses immediate threat of severe epidemics of waterborne diseases, several of which can be life-threatening. Clean water and sanitation are essential complements to a healthy living. The United States Department of State sums it up more befittingly, saying, “Water is life; it is in the food we eat, the electricity that powers our homes, and in crops that we grow. Water allows our economy to thrive, our children to grow up healthy, and can build peace and cooperation between neighbours” It is therefore hard to imagine life without water [4,7]. Sanitation is the hygienic means of promoting health through prevention of human contact with the hazards of wastes as well as the treatment and proper disposal of sewage or wastewater. Improved sanitation facility is defined as including connection to a sewer or septic tank system, pour-flush latrine, simple (or double) pit or ventilated improved pit latrine allowing for acceptable local technologies. The excreta disposal system was considered adequate if it was private or shared (but not public) and if it hygienically separates human excreta from human contact[8,9].

In Nigeria, adequate sanitation is typically in the form of septic tanks, as there is no central sewage system, except for Abuja and some areas of Lagos[10]. A 2006 study estimated that only 1% of Lagos households were connected to sewers[11]. Lagos has four wastewater treatment plants which were rehabilitated around 2010. As of 2011, the state planned to build ten new "mega wastewater treatment plants" over the next five years with the help of private investors[12] though these have not yet materialized.

Contaminated water together with lack of sanitation was estimated to cause about one percent of disability adjusted life years worldwide in 2010[13]. Contaminated water and poor sanitation are linked to transmission of diseases such as cholera, diarrhoea, dysentery, hepatitis A, typhoid and polio. Absent, inadequate, or inappropriately managed water and sanitation services expose individuals to preventable health risks[14]. In many cases, these illnesses have serious health effects such as reduced mental capacity, stunted physical growth and physical disability, internal organ damage and premature death. According to the United Nations Children’s Fund (UNICEF), about 66 million people in Nigeria do not have access to safe water, while over 110 million lacked access to improved sanitation. As a result, about

150,000 children under the age of five are estimated to die annually largely due to diarrhoea related diseases that are mostly associated with unsafe drinking water[15]. Nearly 10% of the global disease burden can be reduced through improved WASH (water, sanitation and hygiene) access and resource management[16]. Water-related diseases are the most common cause of illness and death among the poor in developing countries[17]. The primary objective of this study was to determine the access to safe drinking water and sanitary facilities in Lagos Mainland LGA. Secondary objective was to ascertain the respondents' knowledge of waterborne diseases.

METHOD

Study Design

This was a cross-sectional descriptive study to ascertain access to safe drinking water, investigate source of safe drinking water, identify type and access to sanitation facility and ascertain knowledge of water borne diseases amongst the residents of Lagos Mainland Local Government Area of Lagos State was carried out.

Inclusion Criteria

The inclusion criteria for the study were that they be residents of Lagos Mainland Local Government Area of Lagos State (either male or female), with minimum of 18 years of age.

Exclusion Criteria

Non-residents of Lagos Mainland Local Government Area of Lagos State and those below 18 years of age were excluded from the study.

Sampling

Multistage sampling technique was employed for the study.

Stage 1: From the five wards that form Lagos Mainland Local Government Area of Lagos State, two wards were selected using simple random sampling method.

Stage 2: Each of the two selected wards has an average of 25 streets each, from which 15 streets were selected by balloting from each of them.

Stage 3: Each of the streets has an average of 35 houses from where respondents were selected for the study. Systematic sampling technique was used in selection of residents for the study. Every first house at the count of three was sampled for the study. The first person in each of the selected houses that met the inclusion criteria was used for the study.

Data Collection Tool

The questionnaire used for this study focused on the relevant questions on water and sanitation. The questionnaire was divided into sections. Section A was on socio-demographic characteristics, Section B on questions relating to water and toilet facility, Section C was on knowledge of water borne diseases, Section D had questions on quality of water and sanitation while Section E had questions on access to water and quality of life.

Data Collection

The questionnaire was interviewer or self-administered (for those that were comfortable with English language). Data collection was scheduled for the weekends when people are more available at home.

Data Analysis

Data derived from this study were analyzed using Statistical Package for Social Sciences (SPSS v.20.0) Frequency and percentages were used for descriptive statistics.

The toilets were visually checked and marked yes or no for cleanliness.

Ethical Considerations

Permission was obtained from the Lagos Mainland Local Government Council through a request made to the LGA with the purpose of the study clearly presented in the request. In addition, informed consent was obtained from each of the respondents with the purpose of the study clearly explained

and feedback sought. The respondents were assured of absolute confidentiality of the information provided as part of the study. The questionnaire was administered to those that gave consent.

RESULTS

Of the 381 questionnaires distributed 360 were returned and properly filled thereby giving a response rate of 94.5 %. The results are presented as tables below.

Socio-demographic characteristics of respondents

Table 1 shows that about 40% of the respondents were between 38-47 years old, majority were male (75%) and most of the heads of households were male (85%). In addition, about 60% of the households had 4 – 6 occupants and majority had tertiary qualification (75%). From the table, it could be seen that 67% of the households sampled were in the category of high-income earners (for the purpose of this study, N71,000 and above are considered as high-income earners).

Table 1: Socio-demographic characteristics of the respondents

Characteristics	n (%) N = 360
Age	
18-27	18 (5)
28-37	36 (10)
38-47	144 (40)
48-57	108 (30)
Above 57	54 (15)
Gender of Head of Household	
Male	306 (85)
Female	54 (15)
Gender of Respondent	
Male	270 (75)
Female	90 (25)
Number of persons per household	
1-3	36 (10)
4-6	216 (60)
7 and above	108 (30)
Educational Qualification	
Tertiary	270 (75)
Secondary	61 (17)
Primary	29 (8)
Household Monthly income	
26000-40000	20 (5)
41000-70000	100 (28)
71000-100000	144 (40)
Above 100000	96 (27)
Type of House ownership	
Owner	72 (20)
Rented	288 (80)

Access to safe drinking water and sanitary facilities

Table 2 shows that half of the respondents (50%) use sachet water (popularly called pure water) and half (50%) also have piped water in the compound. All the respondents fetched water in less than 30 minutes from a source that is less than 100 metres for the majority (85%). Majority (90%) of the respondents consumed more than 20 litres of water per day. Other variables considered under water and sanitation results can be seen in Table 2.

Table 2: Responses on Water and Sanitation

Characteristics	n (%) N = 360
Source of drinking water	
Piped water into Flat/House	18 (5)
Piped water into compound	36 (10)
Public Tap	36 (10)
Public borehole	90 (25)
Sachet water (Nylon pure water)	180 (50)
Source of water for other purposes	
Piped water into Flat/House	36 (10)
Piped water into compound	180 (50)
Public Tap	36 (10)
Public borehole	108 (30)
Time taken to fetch water	
Water in the house	18 (5)
Less than 15 minutes	288 (80)
Less than 30 minutes	54 (15)
Distance of water source	
Water in the house/compound	216 (60)
Less than 100m	90 (25)
Greater than 100m	54 (15)
Daily consumption of water	
Greater than 20 litres	324 (90)
Exactly 20 litres	36 (10)
Type of toilet facility	
Flush toilet	288 (80)
Improved pit latrine	72 (20)
Share toilet with households	
Yes	216 (60)
No	144 (40)

Table 3 shows that all the respondents have heard about water borne diseases and majority (80%) knew they can be caused by unsafe drinking water, and more than half (55.6%) of the respondents affirmed that they have not treated water related diseases in the last two months.

Table 3: Knowledge of water-borne diseases

Characteristic	n (%) N = 360
Heard of water-borne diseases	360 (100)
Aware that disease can be caused by unsafe drinking water	288 (80)
Have not treated water borne disease in the last two months	180 (55.6)

DISCUSSION

The study found out that almost all the households had access to water supply and quite a large proportion of households had improved toilet facility.

The study showed that majority of the households had access to their own private piped water inside their house or in their compound. This is better than global situations where 58 % of the population used drinking water from a piped connection in their dwelling, plot or yard[3]. It has been found that households with piped drinking water have lower prevalence and duration of diarrhoea disease among children [18]. Piped systems, especially with household connections, provide greater convenience and are thus preferred by people in most communities. Making large quantities of safe water readily accessible to all households by governments is often not easily realizable[19].

Almost all the households (80%) had access to improved sources of drinking water because of reasonable access to local government borehole and NAFDAC certified sachet (pure) water. In many communities, household water is managed exclusively by women, and this was observed in the study. Women and girls are generally the ones who obtain water for the house, transport it, store it and then use it for various household purposes. Ensuring easy access to water supply systems can greatly reduce the time women spend collecting water, allowing more time to care for young children and for income generating activities[20].

With respect to distance of water source from dwelling, majority of the household had access to water within a distance of 100 metres or less and the result indicated that majority of the households use more than 20 litres of water per person a day. This finding is higher and better than the WHO and UNICEF Joint Monitoring Programme (JMP) recommendations which describe reasonable access as being "the availability of at least 20 litres per person per day from a source within one kilometre of user's dwelling"[1]. In this study, a good number of the respondents attested to the fact that their drinking water is of good quality unlike in a previous study[21] and all of them affirmed that water is important for their health.

The study revealed that majority of the households surveyed use improved private toilets implying that they will enjoy improved health and fewer episodes of diarrhoeal disease among the children.

A previous study showed that community coverage of improved sanitation of 75% is associated with improved health while less than 75 percent places those with improved sanitation in their house at risk because of the poor environmental conditions surrounding them[22]. Improved hygiene and sanitation when practiced by up to 80% of the population is known to show radically reduced cases of diarrhoeal disease and worm infections[23]. The study showed that less than half of the private toilets in the surveyed households were shared between households. This may be less hygienic since shared toilet facility can be less hygienic than facilities used by a single household[3]. For the improvement of the hygiene in households, the toilet facility must be kept clean and well maintained[20] and the facilities in this study were found to meet the international standard definition of clean latrine which is defined as "Latrine, which is not full, do not have feacal matter on the latrine floor and wall, no or few flies in or near the latrine and doesn't smell bad"[24].

Majority of the household do not treat their water as a result of improved water supply whereby their households drank sachet water and from public borehole provided by the local government. Improved water supply as contained in the Lagos State water sector policy draft 2013, usually replaces traditional sources of water such as river and open well which are often contaminated and distanced from their household[25].

All the respondents have heard about water borne diseases and majority knew they can be caused by unsafe drinking water, and

more than half of the respondents affirmed that they have not treated water related diseases in the last 2 months. This result is better than two previous studies in Pakistan where only about 78 % and 66 % knew about water borne diseases[21,27]. This might be connected with their attestation that their drinking water is of good quality and their knowledge of the fact that water borne diseases can be caused by unsafe water. A previous study shows that poor quality water results in repeated episodes of water borne diseases and income loss due to treatment of these regular bouts of diseases in Quetta city, Pakistan[27]. A study by Shandra and colleagues found that higher levels of access to improved water sources and an improved sanitation facility are associated with lower levels of child mortality within sub-Saharan African[25].

CONCLUSION

From this study it can be concluded that there is access to safe drinking water and good sanitation in this locality and as such the respondents and members of their household are at lowered risk of toilet infection and outbreak of cholera and diarrhoea.
The surveyed households had close access to water. Sachet water was the main source of drinking water. The sanitation facilities in the studied area were adequate for healthy living and good quality of life.

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