



Provision of Hygiene and Clean Water to Reduce Water Borne Diseases: A Case Study of Lagos

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ABSTRACT

Contaminated drinking water sources by pathogens and harmful chemicals impose high danger to life owing to increasing population densities, absence of adequate sanitation, infrastructure and poor hygiene. Common airborne diseases such as diarrhea typhoid fever, cholera, dysentery, and hepatitis A are caused by bad water and poor sanitation includes. In Nigeria 66 million Nigerians have poor accesses to clean water and hygienic sanitation resulting to premature death and increased cost in health care. In Lagos state, it is disclosed that more than half of the patients who visit the health centers and hospitals on a daily basis are treated for water related diseases. This study investigated the provision of hygiene and clean water to reduce water borne diseases with particular interest in Lagos state. The study adopted a survey on a sample of 400 respondents. Questionnaire was adopted for data collection and the analysis was carried out using frequencies and percentages. The hypothesis formulated was tested using Chi Square. The result of the study indicated that there is a significant impact of provision of hygiene and clean water on reduction of water borne diseases. Based on this result, there is study concludes that clean, safe and affordable water is vital for life. As a result, the study recommended measures to ensuring clean, safe and availability of safe water for man's used

Keywords: Provision of Hygiene, Clean Water, Water Borne Diseases

1 INTRODUCTION

Clean water is undeniably crucial for sanitation and hygiene given its significance in health, social and economic development globally (Khalifa&Bidaisee, 2018). The importance of clean water is mostly neglected in the developing countries, as many people understand the importance of water but do not entirely understand the importance of that water being clean. The United Nations has labeled the access to clean water a basic human right (NAS, 2016). The danger of contamination of drinking water sources by pathogens and harmful chemicals is high owing to increasing population densities, absence of adequate sanitation, infrastructure and poor hygiene. Shortages of clean water are linked to unsuitable management, startling population growth, unfavourable policy implementation of water-related projects and rise in industrial activities (Kora et al., 2017).

Waterborne diseases refer to diseases contracted from drinking polluted water having pathogenic microorganisms; and the presence of these diseases is made possible by the unavailability of clean and safe drinking water, poor environmental sanitation, poor sanitation and hygiene practices, as well as indiscriminate waste dumping and high pH levels of the wells in an area (Manetu&Karanja, 2021). Common diarrhea diseases caused by bad water and poor sanitation includes typhoid fever, cholera, dysentery, and hepatitis A. (Afuwape, 2017). Thus, access to water can be linked to good hygiene practices, and good health. As the first step towards the elimination of poverty is the provision and access to good water and good sanitary practices. It is to this end, that the present study examines the extent to which provision of hygiene and clean water reduces water borne diseases in Lagos state.

Statement of research problem

An important factor for socio economic development of a country is access to water, sanitation and hygiene, which are also significant human rights necessary to nutrition and good health (Olukanni, Ajetomobi, Tebowei, Ologun&Kayode, 2014). This implies that the inability to access these basic services have a critical effect on humans. The UNICEF report revealed that over a billion people have limited access to clean and safe water; and that more than 2billion people live in very unhygienic condition. This indicates that at every point in time, there are people suffering from particular water borne disease or the other caused by unhygienic sanitation and unsafe water. The situation in Nigeria shows that close to 66 million Nigerians have poor accesses to clean water and hygienic sanitation resulting to premature death and increased cost in health care (Afuwape, 2017).

WHO disclosed that one of the world's highest killers both past and present is death caused by poor water condition and that the root cause of 80% of the diseases is rooted in hygienic water. In Lagos state, it is disclosed that more than half of the patients who visit the health centers and hospitals on a daily basis are treated for water related diseases, which implies that in other states, these could be a higher figure. This is an indication of the need to address this issue of poor hygiene and inaccessibility to clean water as a way of curtailing the growing cases of water borne diseases in the state (Afuwape, 2017). Aware of this challenges posed by poor hygiene practices and inaccessible water as well as the importance of water and hygienic resources in the economic development of Nigeria, this formed the resolve of this paper to examine the extent to which the provision of hygiene and clean water reduces water borne diseases in Lagos.

Research objectives

Generally, the study examined the provision of hygiene and clean water in the reduction of water borne diseases in Lagos state. Specifically, the study;

1. Identify the challenges hindering the provision and accessibility to hygiene and clean water in Lagos state.
2. Examine the impact of provision of hygiene and clean water on the reduction of water borne diseases in Lagos state.
3. Ascertain how lack of access to clean water and hygiene affect health.
4. Examine the extent to which improvement in sanitation reduce the chances of sickness from water borne diseases.

Research questions

1. What are the challenges hindering the provision and accessibility to hygiene and clean water in Lagos state?
2. What is the impact of provision of hygiene and clean water on the reduction of water borne diseases in Lagos state?
3. How does lack of access to clean water and hygiene affect health?
4. To what extent will the improvement in sanitation reduce the chances of sickness from water borne diseases?

Research hypothesis

H0: There is no significant impact of provision of hygiene and clean water on reduction of water borne diseases.

H1: There is significant impact of provision of hygiene and clean water on reduction of water borne diseases.

Literature review

Water is vital for life and survival and clean water is essential for drinking, cooking, hygiene and so much more. An improved or clean drinking-water source is one that effectively protects the source from external contamination, by the nature of its construction and when appropriately used, particularly faecal matter. Examples include piped water, tube wells or boreholes, public taps or standpipes, protected springs, protected dug wells or rainwater (WHO/UNICEF, 2015).

In Nigeria, majority of the people living along the path of water bodies still source and drink from them regardless of the state of these water bodies without any method of treatment. These natural waters comprise numerous uncultured microbial species that are yet to be identified (Nwabor et al., 2016). Different infectious agents harmful to human health breed in polluted water which can cause waterborne illnesses. Besides the contamination of water from humans and animals, nature itself can also contaminate water, making it unusable.

Hygiene is defined by the World Health Organisation as the conditions and practices that aid in sustenance of health and prevention of the spread of diseases. It is a general term that includes personal habit choices as how frequently to bathe, wash hands, trim fingernails, and change clothing (Bashir, 2019). The importance of clean water is mostly neglected in the developing countries. The importance of water is understood but not its

importance of being clean. A basic human right is accessibility to good water as indicated by the United Nations (NAS, 2016). The danger of contamination of drinking water sources by pathogens and harmful chemicals is high due to factors such as poor hygiene practices, poor sanitation, high population growth and increased industrial activities (Kora et al., 2017).

Waterborne diseases are those diseases that are communicated through the direct intake of water polluted with pathogenic microorganisms. They are highly attributed to absence of clean and safe drinking water, poor environmental sanitation, poor sanitation and hygiene practices, indiscriminate disposal of waste, low topography and swamps that lead to high microbial growth, effect of age-long communal crisis, water hardness and high pH levels of the wells and borehole water in an area (Manetu&Karanja, 2021). Most waterborne diseases can be caused by protozoa, bacteria, viruses, and intestinal parasites and are characterized by diarrhea, which involves excessive stooling, often causing dehydration and probably death. Examples are Cholera, Typhoid, Amoebic dysentery, Giardiasis, Bacillary dysentery (shigellosis), Cryptosporidiosis, Paratyphoid, Balantidiasis, Salmonellosis, Campylobacter enteritis, E. coli diarrhea, Rotavirus diarrhea, Leptospirosis Hepatitis A, and Poliomyelitis (Nwabor et al., 2016).

Empirical studies

Manetu and Karanja (2021) reviewed the occurrence and burden of waterborne diseases. Literature on past and present studies on waterborne diseases, the risk factors and intervention practices were reviewed. It was revealed that the absence of piped water and reliance of rural occupants on surface waters often polluted with fecal materials are the main reasons for the increasing prevalence of waterborne diseases. Also, poor hygiene played a significant role in spreading waterborne diseases.

Okpasuo et al. (2020) investigated waterborne infections prevalence in Enugu state, Nigeria and the risks associated with household drinking water choices, knowledge, and practices. Questionnaire was used to collect data from 403 respondents from 115 households were selected using a cross-sectional multi-stage sampling. Stool samples were also collected and subjected to standard parasitic and bacterial diagnostic methods. Results revealed a prevalence of water borne infections (WBIs) was over 75% in all age groups, but decreased with age and was over 80% in all communities; the chances of infection from public and borehole users was over two times more than non-users; the risk of WBDs was significantly reduced by 60% in sachet water drinkers; poor hygiene was the most important contributing factor of WBIs.

Olukanni and Okorie (2015) assessed the socioeconomic and cultural factors impelling residents in Ota, in South West Nigeria on water, sanitation and hygiene (WaSH) services. Structured questionnaire was one of the major research instruments used for data collection. Analysis of the data revealed that literacy level and age group significantly influenced housing settlements while water source and quality significantly affected health, and its quantity, sanitation practices. Also, the problem of clean water supply was seen to be more of economic and financial challenges that required timely government intervention.

Theoretical framework: The trans-theoretical model

This is one of the most prominent models of behaviour change created by Prochaska and Diclemente in 1977, which emphasizes that some individuals are unaware of the danger poor hygiene and unclean water. This theory proposes that an individual passes through five logical stages of decision making process before accepting particular health behavior: Pre-contemplation, contemplation, preparation, action and maintenance (Karl, 2020). During the pre-contemplation stage, the individual is oblivious to the dangers related to poor hygiene and consumption of unclean water. At the contemplation stage, the individual is aware of the enormity of certain health risk practices which may be associated with unclean water and poor hygiene. At the preparation stage, the individual is ready to start taking action shortly. At the action stage, the individual tries out the positive behaviour, plans and seeks for guidance and support to quit unhygienic practices and use of unclean water. At the maintenance stage, the individual buttresses the plan of action, is aware of the lure to go back to the old but always reminds self of the benefits of the new behaviour to be adopted thereby discarding the old behaviour in favour of new behaviour. The change is a continuous one (Siddharthan et al., 2021).

This model provided the strongest basis for the study because it motivates people to try out new health behaviours by getting good knowledge of the behaviour to be adopted. The position of stages of behaviour in the theory is that it allows individuals to weigh dangers associated with health problems related to poor hygiene and unclean water like diarrhea, typhoid, etc. Sickness or death arising from polluted water and poor hygiene are compared to the benefit of adopting good hygiene and consuming clean water for the prevention of water and hygiene related diseases as well as the promotion of personal and community health.

Methodology

The paper adopted a descriptive research survey in conducting the study. The paper purposively selected five local government areas, Ikeja, Mushin, Agege, Alimosho and Ifako-Ijaye areas, in Lagos state as the study location based on the increasing report of water related diseases being treated on a daily basis in hospitals. Using random sampling, hundred people were selected from each of these areas bring the sample size

to a total of 500. The primary source of data was questionnaire structured with a four point likert scale format and administered to the respondents with the aid of research assistants. The data was descriptively analyzed using means and standard deviations. While the hypothesis formulated will be tested using chi-square.

Data presentation, analysis and discussions

Five hundred questionnaires were distributed but only four hundred were returned. The analysis of the data collected was based on the four hundred properly answered questionnaires as presented below:

Table 1: Socio-demographic characteristics of the respondents

Variable	Frequency	Percentage
Gender		
Male	184	46.1
Female	215	53.9
Total	400	100
Age		
Below 18 yrs	97	24.3
18-30 yrs	121	30.3
31-50yrs	119	29.8
Above 50 yrs	63	15.5
Total	400	100

Field survey, 2021

The table above indicates the socio-demographic characteristics of the respondents. Of the 400 respondents, 46.1% were male whereas 53.9% were female. This shows that both male and female participated in the study. The study further indicates that the respondents were from different age groups: 24.3% of the respondents were from the age below 18 years; 30.3% are between 18-30 years; 29.8% are within the age 31-50 years and the remaining 15.5% are within the age group above 50 years.

RQ1: What are the challenges hindering the provision and accessibility to hygiene and clean water in Lagos state?

Table 2: The challenges hindering the provision and accessibility to hygiene and clean water in Lagos state

STATEMENT	SA	%	A	%	D	%	SD	%	Total% in agreement
Poor water quality	161	40.3	138	34.8	50	12.5	51	12.8	75.1
Overpopulation problems	205	51.3	99	24.8	58	14.5	38	9.5	76.1
Inadequate sanitation and wastewater treatment	174	43.6	135	33.8	70	17.5	20	5	61.9
Lack of planning and implementation.	191	47.8	143	35.8	46	11.5	20	5	83.6
Malfunctioning equipment and plants	152	38.2	163	41	65	16.3	18	4.5	79.2

Field survey (2021)

The table above presents the challenges hindering the provision and accessibility to hygiene and clean water in Lagos state. The result indicated that 75.1% of the respondents are in agreement that 'poor water quality' is one of the major challenges hindering the provision and accessibility to hygiene and clean water in Lagos state. Other challenges include: Overpopulation problems (76.1%); Inadequate sanitation and wastewater treatment (61.9%); Lack of planning and implementation (83.6%); and Malfunctioning equipment and plants (79.2%).

RQ2: What is the impact of provision of hygiene and clean water on the reduction of water borne diseases in Lagos state?**Table 3: The impact of provision of hygiene and clean water on the reduction of water borne diseases in Lagos state**

STATEMENT	SA	%	A	%	D	%	SD	%	Total % in agreement
Provision of hygiene and clean water can help save lives, drive economic growth	186	46.6	145	36.3	36	9	33	8.3	82.9
Provision of clean water reduces the risk of people drinking contaminated water	166	41.6	125	31.3	78	19.5	31	7.8	72.9
Provision of hygiene and clean water reduce risks of water-borne infectious diseases	178	44.5	108	27	48	12	66	16.5	71.5
Provision of hygiene and clean water limits the transmission of diseases	122	30.2	166	41.5	77	19.3	35	8.8	71.7

Field survey (2021)

The study revealed the impact of provision of hygiene and clean water on the reduction of water borne diseases in Lagos state. The result indicates that 82.9% of the respondents are in agreement to the statement: 'Provision of hygiene and clean water can help save lives, drive economic growth'; 72.9% supports 'Provision of clean water reduces the risk of people drinking contaminated water'; 71.5% agreed to the statement: "Provision of hygiene and clean water reduce risks of water-borne infectious diseases"; while 71.7% are in agreement to the statement: "Provision of hygiene and clean water limits the transmission of diseases".

RQ3: How does lack of access to clean water and hygiene affect health?**Table 4: How lack of access to clean water and hygiene affect health**

STATEMENT	SA	%	A	%	D	%	SD	%	Total % in agreement
Lack of access to clean water causes deaths from diarrheamainly in children	154	38.6	141	35.3	72	18	33	8.3	73.9
Inappropriately managed water and sanitation services expose individuals to preventable health risks	119	29.8	163	40.8	69	17.3	49	12.3	70.6
Poor water and sanitation severely erode health and wellbeing gains made by food and nutrition programs.	167	41.8	170	42.5	60	15	3	0.8	84.3

Field survey (2021)

Table 4 above presents the respondents opinion on how lack of access to clean water and hygiene affect health. 73.9% of the respondents support that lack of access to clean water causes deaths from diarrhea mainly in children; 70.6% agreed to the statement "Inappropriately managed water and sanitation services expose individuals to preventable health risks"; while 84.3% support the statement that: "Poor water and sanitation severely erode health and wellbeing gains made by food and nutrition programs".

RQ4: To what extent will the improvement in sanitation reduce the chances of sickness from water borne diseases?**Table 5: The extent to which the improvement in sanitation reduce the chances of sickness from water borne diseases**

STATEMENT	SA	%	A	%	D	%	SD	%	Total % in agreement
Sanitation will prevent exposure to fecal pathogens	140	35	166	41.5	38	9.5	56	14	76.5
Improved sanitation will lower health system costs	194	48.7	127	31.8	37	9.3	41	10.3	80.5
Improvements in safe sanitation reduces the chances of becoming sick from waterborne diseases	160	40.1	155	38.8	50	12.5	34	8.5	78.9
Improved sanitation helps reduce childhood disease and deaths	118	29.5	124	31	83	20.8	75	18.9	60.5

Field survey (2021)

Table 5 above indicates the respondents opinion of the respondents on the extent to which the improvement in sanitation reduce the chances of sickness from water borne diseases. As indicated in the table, 76.5% of the respondents agreed to the statement that “Sanitation will prevent exposure to fecal pathogens”; 80.5% supports that ‘improved sanitation will lower health system costs’; 78.9% agreed that “Improvements in safe sanitation reduces the chances of becoming sick from waterborne diseases”; while 60.5% are in agreement that “Improved sanitation helps reduce childhood disease and deaths”

Research hypothesis

H0: There is no significant impact of provision of hygiene and clean water on reduction of water borne diseases.

H1: There is significant impact of provision of hygiene and clean water on reduction of water borne diseases.

Table 5 Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.390 ^a	2	.030
Likelihood Ratio	9.800	13	.032
Linear-by-Linear Association	.036	15	.049
N of Valid Cases	400		

a. 19 cells (79.2%) have expected count less than 5. The minimum expected count is .13.

In the table, the Pearson Chi square indicates the P-value of 0.030 which is less than the critical value of 0.05%; As a result, we reject the null hypothesis. This implies that there is a significant impact of provision of hygiene and clean water on reduction of water borne diseases. Water is vital for life and survival and clean water is essential for drinking, cooking, hygiene and so much more. The result of this study confirm that carried out by the World Health Organization (WHO, 2019), which also indicated that safe and readily available water is relevant to public health. It could be for drinking, washing, or other domestic and agricultural used. The fact remains that human as well as animal need water for growth, good health and sustainability. The report by WHO disclosed that one of the world’s highest killers both past and present is death caused by poor water condition and that the root cause of 80% of the diseases is rooted in hygienic water. According to Afuwape (2017), more than 66 million Nigerians have poor accesses to clean water and hygienic sanitation resulting to premature death and increased cost in health care. The situation is specifically significant in Lagos state also shows that above half of the patients who visit the health centers and hospitals on a daily basis are treated for water related diseases. The study also supports Manetuand Karanja (2021) who indicated that good and hygienic water is essential for healthy living.

Conclusions and recommendations

The result of this study indicates that lack of safe and affordable drinking water is the root cause of most health challenges experience in post countries in the world, including Nigeria and Lagos state precisely. A nationwide survey by UNICEF/WHO (2017) showed that for development and survival of children, there is need for easy access to clean water and good hygiene practices are essential for the survival and development of children. In the report, while 663 million lacks improved water sources, about 2.4 billion people lives in poor sanitation and 946 million people defecate in the open (UNICEF/WHO, 2017). It is without doubt that majority of health challenges are directly or indirectly connected with hygienic. Against the result of this study, it is imperative to improve the water condition for the people of Lagos state as a step in the right direction towards improving the health condition of the people. The study recommends constant remediation of Lagos state water to make it safer for the people. There should be strict implementation of policies and laws meant to prevent indiscriminating throwing of solid waste in canals, rivers, seas or creeks in Lagos state. All houses must have good toilets, like wise offices and shops to completely eradicate defecating in the open which impede the sanitation of the environment.

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APPENDIX

**PROVISION OF HYGIENE AND CLEAN WATER TO REDUCE WATER BORNE DISEASES: A CASE STUDY OF LAGOS
REQUEST FOR INFORMATION**

Dear Respondent,

I am carrying out a study on “provision of hygiene and clean water to reduce water borne diseases: a case study of Lagos” and you have been chosen to be part of the study. This questionnaire is only for academic purposes. Kindly select the response which applies to you and all information will be kept confidential

SECTION A:

Gender: Male () Female ()

Age: Below 18 years ()
 18-30 years ()
 31-50 years ()
 Above 50 years ()

SECTION B:

Instructions: Please tick (√) as appropriate where

SA = Strongly Agree (SA), A = Agree, D = Disagree (D), SD = Strongly Disagree (SD)

Key: Strongly agree (4), Agree (3), Disagree (2), and strongly disagree (1).

S/N	ITEMS	SA	A	D	SD
RQ1	What are the challenges hindering the provision and accessibility to hygiene and clean water in Lagos state?				
1	Poor water quality				
2	Overpopulation problems				
3	Inadequate sanitation and wastewater treatment				
4	Lack of planning and implementation.				
5	Malfunctioning equipment and plants				
RQ2	What is the impact of provision of hygiene and clean water on the reduction of water borne diseases in Lagos state?				
6	Provision of hygiene and clean water can help save lives, drive economic growth				
7	Provision of clean water reduces the risk of people drinking contaminated water				
8	Provision of hygiene and clean water reduce risks of water-borne infectious diseases				
9	Provision of hygiene and clean water limits the transmission of diseases				
RQ3	How does lack of access to clean water and hygiene affect health?				
10	Lack of access to clean water causes deaths from diarrhea mainly in children				
11	Inappropriately managed water and sanitation services expose individuals to preventable health risks				
12	Poor water and sanitation severely erode health and wellbeing gains made by food and nutrition programs.				
RQ4	To what extent will the improvement in sanitation reduce the chances of sickness from water borne diseases?				
13	Sanitation will prevent exposure to fecal pathogens				
14	Improved sanitation will lower health system costs				
15	Improvements in safe sanitation reduces the chances of becoming sick from waterborne diseases				
16	Improved sanitation helps reduce childhood disease and deaths				