IMPLICATIONS OF WATER POLLUTION ON THE HEALTH OF THE PEOPLE: A CASE STUDY OF PATIENTS IN THE UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN CITY, NIGERIA

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Abstract

Water pollution in Nigeria has become a major public concern in recent times because it breeds poor environmental conditions which threatens the health of the people. To determine the effects of water pollution on the people in Benin City, we decided to conduct research in Community Health Department, University of Benin Teaching Hospital, Benin City. Nine hundred and fourteen (914) patients who were victims of water-borne diseases were selected and studied from January 2011 to July 2011. Official records in the hospital were used for data collection. The study revealed that the patients were infected with water-borne diseases caused by water pollution. The water-borne diseases discovered in the patients were cholera, diarrhea, hepatitis, and typhoid. Concrete suggestions were proffered about how to reduce the water-borne infections diseases, and improve the health of the people.

Water is important to humanity, animals, and plants for survival. The quality and quantity of available water supply intake have positive and negative implications on health status of communities and societies. Over 500,000 people die daily worldwide to water-borne diseases (Herschy 1999). It is also estimated that about 4 million children under five years old die annually in developing countries (USAID, 1990). Worst still 2.3 billion people world-wide have mortality and morbidity associated with water-related ailments (WHO, 1997). Increased population, geological factors, rapid urbanization, agricultural development, global markets, industrial developments, and poor waste regulation had affected the quality and quantity of life. Those developments represented multi-layered complex processes which place the environment, human activities, food production, and human health at great risk. Water is about 75% in the composition of human body. Water aids in the digestion of food in the body, and acts as solvent to soluble substance. It is used for different purposes such as domestic and industrial purposes. Domestic uses of water include drinking, bathing, laundry, cooking, scrubbing and washing utensils. Industrial uses of water include processing; water disposal; economic production; washing and clearing of plants, equipment, and machineries.

There are two types of water bodies, namely: surface and underground. Surface water includes oceans, seas, rivers, streams, brooks, lakes and flood. Whereas underground water comprises boreholes and wells. Surface water picks up solid, liquid and gas as rainwater or as percolates through the soil layers.

Those substances are classified as biological, physical and radiological impurities. Boreholes and wells are main sources of water supply in cities and urban areas, and even in rural communities in Nigeria today. Compounds and houses have pipe-borne water supply system with taps that never run or bring out water. This is because of the inefficiency, ineffectiveness, and deficiency in the services of Public Water Works Departments. In the rural areas streams are narrowing down and drying up. People prefer to sink boreholes and wells, and construct tanks to store rain water during the rainy season. Erah et al. 2002; Anaele 2004, among others discovered that uncontrolled discharge of toxic effluents into the soil, streams, and rivers by industries, factories, and indiscriminate dumping of garbage and faeces heavily contaminate groundwaters in Nigeria. Extensive contamination of residential wells and boreholes is also caused by sewage from numerous septic tanks, latrines, and soakaway pits most often sited near them. Majority of residents drink underground water without any form of treatment mainly because of ignorance, and perhaps, lack of access to basic methods of water treatment before usage. Such people can easily contact water-borne diseases such as cholera, and in extreme cases if care is not taken, cancerous diseases

Research Prolematique

Water pollution exists in Nigerian environment inside and outside the homes compounds, alley ways, pathways, streets, and high roads. Most of the roads are bad; pot-holes in places, and everywhere is flooded especially in rainy season, i.e. March to October yearly. Vehicles, motorists and pedestrians are usually trapped in high level floods, cars sink deep-down into the high level floods as heavy torrential rain falls, and thereafter. In the circumstances, it is not unusual to see motorists, passengers, and pedestrians who are trapped in flood waters and trying to push out their vehicles to safer grounds. Sometimes, disastrous floods flush away human beings, properties and affluent straight away, down into the river and get them deposited and possibly drowned. Nigerians drink much water, use much water for domestic and industrial purposes. Going by my own personal observation and documented literature, it is obvious that the underground and surface waters which we drink and use for domestic, industrial and commercial purposes are not completely safe and thus, could be contaminated. People are after sick with all sorts of protracted symptoms and nuclear diagnoses. What are the causal factors? Are the symptoms related to water pollution and water-borne diseases? Which water-borne diseases are the people infected with? Which treatment(s) do they receive? And where? These are the questions this paper tries to answer.

Research Objectives

General Objective:

The major objective of this research was to discover the implications of water pollution on the health of the people in Benin City, Nigeria.

Specific Objectives:

The research had three specific objectives to achieve:

(i) To determine the water-borne diseases which the patients who were treated in (UBTH) University of Benin Teaching Hospital, Benin City contacted, during the period of study i.e. January 2010-July 2010;

(ii) To determine the treatment which they received from the medical team/personnel to cure the diseases; and

(iii) To recommend safety measures in order to avoid contacting the water-borne diseases in the future.

Scope of the Study

The study covered patients, males and females from less than 5 years up to 15 years old and above who were infected with water-borne diseases, and were treated at the Community Health Department, University of Benin Teaching Hospital (UBTH), Benin City, from January 2010 to July 2010. Water-borne diseases are caused by water pollution. Benin City comprises three local government areas, namely: Oredo, Egor, and Ikpoba Okha. It is a sophisticated metropolis with universities, and teaching hospitals, heterogeneous population, centre of administration, commerce, and industry. In terms of efficiency, effectiveness, conveniences and proximity, the research locale is also ideal for the study.

Definition of Terms/Concepts

Pollution: Is the direct and indirect introduction of substances, vibration, health or noise as a result of human activities into the air, water or land which may be harmful to human health or the quality of the environment.

Water Pollution: This is the introduction by man into the environment of substances or energy liable to cause hazards to human health, harm to living organisms and ecological system, damage to structures, or amenity, or interference with legitimate use of environment. It is also any chemical, biological or physical change in water quality that has a harmful effect on living organism or makes water unsuitable for use.

Population: It refers to the specific number of people or sub-category of people, living within a particular area, or a stratum at a given moment as determined by a census count or registration.

Sanitation: Protection of public health by removing and treating contaminated waste.

Waste: This is anything which is no longer useful to the disposer.

Effluent: Waste water from industries.

Garbage: It is unwanted materials or substances that are left discarded after use.

Research Methodology

Research Population

University of Benin Teaching Hospital has many Departments. The Department of concentration for this research is Community Health Department. During the period of study, January 2010 to July 2010, 914 patients were infected with water-borne diseases. Thus, 914 patients formed the research population.

Research Sample Size

The entire research population of 914 were chosen and studied. The sample of 914 patients was drawn from the target population, the patients who were infected with water-borne diseases namely: cholera, diarrhea (water with blood, and water without blood); hepatitis, and typhoid from January 2010-July 2010, a period of six months as follows: Cholera (number of patients = 4), Diarrhea: watery without blood (number of patients = 615), watery with blood (number of patients = 29), Hepatitis (number of patients = 5), Typhoid (number of patients = 261).

All these added together give a total sample size of 914 patients.

Method of Data Collection

Official documents and records were used to collect data of patients who were infected with water-borne diseases according to medical doctor's diagnoses, results of laboratory tests, and treatments received at Community Health Department, University of Benin Teaching Hospital (UBTH) Benin City, from January 2010-July 2011.

Method of Data Analysis

Descriptive method and simple statistics, frequencies, and percentages were used to analyze the data collected.

Discussion/Data Analysis: Implications of Water-Pollution on the Health of the People in Benin City, Nigeria

Water-borne Diseases: Causes and Treatment

(i) *Cholera:*

Out of the 914 patients studied, only four (0.4%) were infected with cholera, 3 patients were less than 5 years old, whereas one (1) patient was 15 years old and above. This shows that babies were more prone to infection of cholera than older ones.

Causes: The disease was caused by a bacterium known as vibrio cholerae. The patients contacted the disease from food and drinking water which were contaminated.

Treatment: For the treatment of cholera, Oral Rehydration Therapy (ORT) was used to replace the lost fluid in the patients. Tetracycline was used to eradicate the bacteria which slowed recovery. In severe cases, intravenous administration was used to save lives; the fluid contained sugar and salt mixed with water.

(ii) **Diarrhoea:**

There were two types of diarrhoea, watery without blood, and watery with blood.

Watery without blood: Out of the 914 patients studied, 615 (67.3%) patients were infected with diarrhoea (watery without blood). Three hundred and fifty one (351) patients were less than 5 years old, 123 patients were 5-14 years old; and 141 patients were 15 years old and above. Statistical analysis showed that majority of the patients, babies less than 5 years old were the victims of diarrhoea, watery without blood. These were followed by patients 15 years old and above.

Watery with blood: There were 29 (3.2%) patients out of 914 who were infected with diarrhoea (watery with blood). Twenty-five patients were less than 5 years old, 3 patients were 5-14 years old, and only one (1) patient was 15 years old and above. Statistical analysis revealed that majority of the patients for diarrhoea (watery with blood) were babies less than 5 years old.

Causes: Diarrhoea was caused by some form of pathogenic known as Escherichia cole. Those patients contacted it through contaminated water and also eating food that was contaminated by flies.

Treatment: Codeine phosphate was used to slow down peristalsis and passage of materials down the bowel which gave time for reabsorption. Antibiotics and administration of fluid, Oral Rehydration Therapy (ORT) was also used.

(iii) **Hepatitis:**

Only 5 patients out of 914 (0.5%) were infected with the hepatitis disease, and they were patients aged 15 years old and above. None of the patients less than 5 years old, and up to – 14 years old had hepatitis disease.

Causes: Hepatitis was caused by entero virus. The patients contacted the disease through contaminated food and water.

Treatment: The 5 patients were given gammaglobulin, and they were immunized with vaccines, havrix and VAQTA. The vaccines were given in a series of two shorts. The second vaccine was given within 6-8 minutes after the first vaccine. The second vaccine was necessary for long protection against the disease.

(iv) **Typhoid**

Out of 914 patients, there were 261 (28.6%) patients who were infected with typhoid. Thirteen (13) patients were less than 5 years old; 8 patients were 5-15 years old, whereas, 240 patients aged 15 years and above. Statistical analysis revealed that majority of the patients who were infected with typhoid disease were grown ups and few babies were victim of the disease during the period of the study.

Causes: Typhoid disease was caused by a bacterium known as Salmonella typhi. The patients contacted the disease by a bacterium known as Salmonella typhi. The patients contacted it by injestion of materials contaminated by human faeces and urine, and also drinking contaminated water and eating contaminated food e.g. taking milk, and canned meat that were not properly processed.

Treatment: The 261 patients who contacted typhoid were treated with antibiotics such as iprofloxacin, chloramphericol. They were also given vaccines for immunity.

Summary and Conclusion

The research was an attempt to explore the implications of water pollution on the health of the people in Benin City using 914 patients in Community Health Department, University of Benin Teaching Hospital (UBTH) as a case study, from January 2010 to July 2010. Documentary evidence and records of the patients were used for data collection. Descriptive methods including frequencies and percentages were used to analyze the data collected. Data analysis revealed that the 914 patients were examined by competent, professional medical personnel. The diseases of the patients were diagnosed and several laboratory tests conducted. It became very clear that the patients contacted four (4) water-borne diseases, namely: cholera, diarrhoea, hepatitis and typhoid. The diseases were caused by water pollution. The patients received professional medical treatment from the medical personnel including medical consultants, doctors, and nurses. They were effectively cured from the water-borne diseases and discharged.

In view of the above research findings, the following recommendations were made to control water pollution and water-born diseases:

(i) Town planners should monitor the mapped-out environmental plans in Benin City to ensure that property developers do not encroach on certain sites to purchase undeveloped land, and construct houses on gutters and waterways. This would help to reduce blockages on the drainage systems, water pollution and health hazards on the people;

(ii) There must be functional and effective drainage system to channel flood waters into the river. This would help to reduce storage of flood waters in places, and keep the environment clean, and hygienic;

(iii) Manufacturing industries and factories should treat their effluents properly before disposal in order to avoid contamination of water;

(iv) Landlords, landladies, house-holders, and tenants should keep their compounds clean, dispose wastes and garbage properly and lay sewage pipes away from bore-holes. This would help to control water pollution, and promote the health of the residents.

(v) Sanitary inspectors should be mobilized to visit industrial and commercial premises, homes and compounds regularly to ensure healthy sanitation; and

(vi) Effective maintenance culture of drainage systems, roads, streets, alley-ways, and pathways are very crucial in order to sustain adequate sanitation, reduce water pollution, and promote the health of the people particularly in Benin City and Nigeria in general.

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