Influence of water security and its' consumption on the health of market women in Oyo township, Nigeria

[1]Oniyangi, Shuaib Olanrewaju; [2*]Fagbamila, Sayofunmi Olaniyi; [1a]Adebowale, Grace Anike, [3]Falusi, Bamidele Ayodeji and [4]Oyawole, Dorcas Omolara.

[1]Department of Health Promotion and Environmental Health Education, University of Ilorin, Ilorin, Nigeria

Email: lanreoniyangi@gmail.com Phone Number: 08034299173

[2]Department of Physical Education, Federal College of Education (Special), Oyo, Nigeria*

E-Mail address: niyifagbamila@gmail.com Phone Number: 08066742770

[3]Department of Chemistry, Federal College of Education (Special), Oyo, Nigeria

E-Mail address: deledoncattle@yahoo.com Phone Number: 08038062506

[4]Department of Biology, Federal College of Education (Special), Oyo, Nigeria

E-Mail address: ayaoyawole2007@yahoo.com Phone Number: 08167321932

[a]Email: preciousaniks97@gmail.com Phone Number: 08030692253

***Corresponding Author.**

Abstract

The influence of water security and its' consumption on the health of market women in Oyo township, Nigeria was investigated in this study. A descriptive research survey was adopted and the population of the study comprised of all market women in Oyo township, Nigeria. Simple random and convenient sampling technique was used to select two markets and four hundred (400) respondents. Structured questionnaire was used for data collection. Pearson Product Moment Correlation was used for data analysis. A correlation coefficient of 0.73 was obtained. Four postulated hypotheses were tested using inferential statistics of chi-square (X^2) at 0.05 alpha levels. Results obtained showed that water security; volume of water consumed; water storage and water purification had significant influence on health of market women. We therefore recommended that market women should be adequately educated on the importance of water security and purification in order to guarantee better healthy living.

Keywords: Water Security, Consumption, Market women, Oyo township, Nigeria

1 Introduction

Water is one of the most important substances on earth as it plays a significant role on both plant and animal survival. Water is essential for the healthy growth of farm crops and farm stock and is used in the manufacturing industries. Environmental Health Practitioner Manual (2010) said that it is most important that water which people drink and use for other purposes is clean. This means that the water must be free of germs and chemicals and must be clean (not cloudy). It must however be stated that human activities has a profound impact on the quality and quantity of fresh water available. Smart (2015) is of the view that security can be portrayed as the protection of persons, building, organization, or protection against threats such as crime or attacks by foreign countries. Securities awareness is needed to reduce unpredictable costs and also it gives us a competitive advantage (Native Intelligence Inc., 2015).

UN- Water (2013) in The United Nations Inter-Agency Mechanism on all Freshwater (2014) defined water security as the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quantity water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-bone pollution and water-related disasters and for preserving ecosystems in a climate of peace and political stability. The term water security captures the dynamic dimensions of water and water-related issues and offers a holistic outlook for addressing water challenges (Michel, 2013).

World Water Assessment Programme (2012) reported that in developing countries, 70% of industrial wastes are dumped untreated into waters where they pollute the usable water supply. It must however be stated that a number of important global drivers are significantly affecting water resources which will promote the risk and vulnerabilities to human security. These global drivers include:

- First, shifting demographics, such as population growth, increasing urbanization and migration and changing consumption patterns will result in increased demand for water recourses.
- Second, a changing hydrological cycle due to human influences such as deforestation, land-use changes and the effect of climate change will have an impact on the water cycle and water availability.
- Increasing demands and competition for water resources across sectors, such as food, energy, industry and environment all these will put a strain on water resources.

Global Water Partnership (2009) said that water security is a pre-condition of any effective poverty reduction strategy and of effective environmental sanitation, wastewater management and flood control. Also said that making the world water secure means tackling the destructive effects of water, that is, damage caused by floods, droughts, landsides, erosion, pollution and water-borne diseases.

Elizabeth Dowdeswell in Awake (2001) reported that about 80 percent of all diseases and more than one third of all deaths in developing countries are caused by contaminated water. Kathleen (2008) affirmed that the functions of bodily fluids include digestion, absorption, circulation, creation of saliva, transportation of nutrients and maintenance of body temperature. When the water intake does not equal output a condition known as dehydration set in. Fluid losses are accentuated in warmer climates, during strenuous exercise, in high altitudes, and in older adults, whose sense of thirst may not be as sharp. Mayo Foundation for Medical Education and Research (2015) also stated that there is need to modify total fluid intake depending on how active the individual is, the climatic condition, the health status and if an individual is pregnant or breast feeding.

Centers for Disease Control and Prevention (2014) described safe water storage as a situation in which once the water has been treated and is safe to use, it is stored in a

container that protects the water from re-contamination. Centers for Disease and Prevention (2014) however, went further and highlighted the following characteristics, which serve as physical barriers to recontamination:

- A small opening with a lid or cover that discourages users from placing potentially contaminated items such as hands, cups, or ladles into the stored water.
- A spigot or small opening to allow easy and safe access to the water without requiring the insertion of hands or objects into the container; and,
- A size appropriate for the household water treatment method, with permanently attached instructions for using the treatment method and for cleaning the container.

World Health Organization (2015) stated that household water treatment and safe storage (HWTS) interventions can lead to dramatic improvement in drinking water quality and reductions in diarrhea disease. This intervention will make an immediate difference to the lives of those who rely on water from polluted rivers, lakes and in some cases, unsafe wells or piped water supplies. World Health Organization (2015), further stated that regardless of whether or not collected household water is initially of acceptable microbiological quality, it often becomes contaminated with pathogens of fecal origin during transport and storage due to unhygienic storage and handling practices.

Water purification is the removal of contaminates from raw water to produce drinking water that is pure enough for human consumption or for industrial use (Science Daily, 2015). Aquasana (2015) said that life on this planet is sustained by healthy, clean and pure drinking water. All About Water (2014) stated that drinking clean, filtered water protects the body from disease and leads to overall greater health. Centres for Disease Control and Prevention (2015) also affirmed that household water treatment systems are composed of two categories which are: point-of-use and point-of-entry. In recent times, the researchers have observed an increase in reported cases of water borne diseases and hypovolemic shock which are the major causes of mortality and mobility among the

population. The purpose of the study therefore is to: (i) Look at the influence of water security, (ii) Volume of water consumed, (iii) Water storage and (iv) Water purification on the health of market women in Oyo township, Nigeria.

1.1 Statement of the Problem

Supply of adequate portable water is one of the essential prerequisites of sound and a healthy life. World Health Organization (1998) reported in Fawell and Nieuwenhuijsen (2015) that there are 2.5 million deaths and 4 billion cases due to diarrhea disease, including dysentery, to which water borne pathogens are a major contributor. Going through available data in health facilities in Oyo township, the researchers observed an increase in reported cases of water borne diseases and hypovolemic shock. However, the researchers examined influence of water security and its' consumption on the health of market women in Oyo township.

1.2 Research Questions

1. Will water security and its' consumption influence health of market women in Oyo township?
2. Will volume of water consumed influence health of market women in Oyo township?
3. Will water storage influence health of market women in Oyo township?
4. Will water purification influence health of market women in Oyo township?

1.3 Research Hypotheses

1. Water security and its consumption will have no significant influence on health of market women in Oyo township.
2. Volume of water consumed will have no significant influence on health of market women in Oyo township.
3. Water storage will have no significant influence on health of market women in Oyo township.

4. Water purification will have no significant influence on health of market women in Oyo township.

1.4 Methodology

A descriptive research of survey type was employed to gather information from the respondents of the study. The population for the study comprised all market women in Oyo township. Multistage sampling technique consisting of simple random and convenient sampling technique was used to select two out of five major markets and four hundred (400) respondents representing ten percent (10%) of the approximated four thousand (4,000) population of market women in Oyo township. That is two hundred respondents each from the selected markets (i.e Ajegunle and Ilora) respectively.

Researcher designed structure questionnaire of Likert format rating scale type was used. The instrument was divided into sections A and B; section A deals with the demographic data of the respondents while section B elicited information on water security, volume of water consumed, water storage, water purification and health. The instrument was validated by three experts from the relevant fields. A test re-test reliability of two weeks interval was conducted using twenty (20) respondents outside the area of study but which is similar to the area of study. The reliability coefficient of 0.73 was obtained through Pearson Product Moment Correlation, this result is high enough to show that the instrument was reliable. This instrument was administered personally by the researchers with the help of four trained Research Assistants, the questionnaire was collected back on the spot. Data collected was collated, sorted, coded and analysed using inferential statistics of chi-square (X^2) analysis.

2 Results and Discussion

2.1 Testing of the hypotheses

Hypothesis 1: Water security will have no significant influence on health of market women in Oyo township.

Table 1 is the summary table which indicates the two positive directions and the two negative directions of the hypothesis 1.

Table 1: Contingency table on water security

Item	Agreed	Disagreed	Total
1	42	368	400
2	19	381	400
3	181	219	400
Total	242	958	1200

Note: Agreed and strongly agreed = agreed (+)
Disagreed and strongly disagreed = disagreed (-)

Table 2: Decision table on water security

Group	Size	α-level	Df	X^2tab	X^2cal	Decision
Agreed	242					Significant
Disagreed	958	0.05	2	5.991	237.5	Reject Null hypothesis

Table 2 shows the calculated chi-square (X^2) value of 237.5 which is greater than the table value of 5.991 at 2 degree of freedom and 0.05 alpha level of significance. Since the calculated chi-square (X^2) value is greater than table value, the null hypothesis is rejected. This implies that water security has significant influence on health of market women in Oyo township. This means that water security influences health of market women.

Hypothesis 2: Volume of water consumed will have no significant influence on health of market women in Oyo township.

Table 3 is the summary table which indicates the two positive directions and the two negative directions of the hypothesis 2.

Table 3: Contingency table on volume of water

Item	Agreed	Disagreed	Total
4	30	370	400
5	60	340	400
6	100	300	400
7	150	250	400
Total	340	1260	1600

Note: Agreed and strongly agreed = agreed (+)
Disagreed and strongly disagreed = disagreed (-)

Table 4: Decision Table

Group	Size	α-level	df	X^2tab	X^2cal	Decision
Agreed	340					Significant
Disagreed	1260	0.05	3	7.815	121.0084	Reject Ho

Table 4 shows the calculated chi-square (X^2) value of 121.0084 which is greater than the table value of 7.815 at 3 degree of freedom and 0.05 alpha level of significance. Since the calculated chi-square (X^2) value is greater than table value, the null hypothesis is rejected. This implies that the volume of water consumed have significant influence on health of market women in Oyo township. This means that volume of water consumed influences the health of market women in Oyo township, Nigeria.

Hypothesis 3: Water storage will have no significant influence on health of market women in Oyo township.

Table 5 is the summary table which indicates the two positive directions and the two negative directions of the hypothesis 3.

Table 5: Contingency table on water storage

Item	Agreed	Disagreed	Total
7	349	51	400
8	210	190	400
9	178	222	400
Total	737	463	1200

Note: Agreed and strongly agreed = agreed (+)
Disagreed and strongly disagreed = disagreed (-)

Table 6: Decision Table

Group	Size	α-level	df	X^2tab	X^2cal	Decision
Agreed	740					Significant
Disagreed	460	0.05	2	5.991	112.92	Reject Ho

Table 6 shows the calculated chi-square (X^2) value of 112.92 which is greater than the table value of 5.991 at 2 degree of freedom and 0.05 alpha level of significance. Since the calculated chi-square (X^2) value is greater than the table value, the null hypothesis is rejected. This implies that water storage have significant influence on health of market women in Oyo township. This means that water storage influences the health of market women in the township.

***Hypothesis 4*:** Water purification will have no significant influence on health of market women in Oyo township.

Table 7 is the summary table which indicates the two positive directions and the two negative directions of the hypothesis 4.

Table 7: Contingency table on water purification.

Item	Agreed	Disagreed	Total
10	320	80	400
11	380	20	400
9	250	150	400
Total	950	250	1200

Note: Agreed and strongly agreed = agreed (+)
Disagreed and strongly disagreed = disagreed (-)

Table 8: Decision Table

Group	Size	α-level	df	X^2tab	X^2cal	Decision
Agreed	950					Significant
Disagreed	250	0.05	2	5.991	128.34	Reject Ho

Table 8 shows the calculated chi-square (X^2) value of 112.92 which is greater than the table value of 5.991 at 2 degree of freedom and 0.05 alpha level of significance. Since the calculated chi-square (X^2) value is greater than the table value, the null hypothesis is rejected. This implies that water purification have significant influence on health of market women in Oyo township. This means that water purification influences the health of market women in Oyo township.

2.2 Discussion of Findings

In table 2, the results show that water security have significant influence on health of market women because calculated Chi-square (X^2) value is greater than table value and the hypothesis is rejected. The result of this hypothesis is in agreement with Global Water Partnership (2009) which affirmed that water security is a pre-condition of any effective environmental sanitation, waste water management and flood control.

In table 4, the results show that volume of water consumed have significant influence on the health of market women because calculated chi-square (X^2) value is greater than table value and the hypothesis is rejected. The results of this hypothesis is in agreement with Mayo Foundation for Medical Education and Research (2015) which stated that there is need to modify total fluid intake depending on how active the individual is, the climatic condition, the health status and if the individual is pregnant or breast feeding.

In table 6, the findings revealed that water storage have significant influence on health of market women because calculated chi-square (X^2) value is greater than the table value and the hypothesis is therefore rejected. The result of this hypothesis is in agreement with that of Would Health Organization (2015) which affirms that household water treatment and safe storage interventions can lead to dramatic improvements in drinking water quality and reductions in diarrhea disease.

Results in table 8, showed that water purification have significant influence on health of market women because calculated chi-square (X^2) value was greater than table value and the hypothesis was hence rejected. The result of this hypothesis is in agreement with that of All About Water (2004) which states that drinking clean, filtered water protects the body from disease and lead to overall greater health.

Conclusion

Based on the findings from the study, the following conclusions were reached:

1. Water security have significant influence on health of market women. This means that water security is essential to healthy living.
2. The volume of water consumed have significant influence on health of market women. This means that the amount of water that is made available to the body has great impact on the state of health of an individual.
3. Water storage has significant influence on health of market women. This means that the technique and how water is been stored has impact on the state of health.

4. Water purification has significant influence on health of market women. This means that water treatment has impact on the state of health.

Recommendation

Based on the findings, the following recommendations were made;

1. Market women must be educated on the importance of water security and adequate consumption as a means for sustaining human existence.
2. Health Promotion and Environmental Health Education experts and other health care givers should educate market women on the importance of drinking sufficient water as a means to promoting healthy living.
3. Market women should be enlightened on importance of safe storage of water as a means of reducing the occurrence of water borne diseases.
4. Health educators and other health care givers should educate market women to see water purification as means of removing pathogenic organisms from the water which lead to greater health.

References

Aquasana Inc. (2015) Live Healthy Blog www.aquana.com. Retrieved 10/07/15.

Awake (2001) Water: Will there be enough.Benin-City: Watch Tower Pg. 5.

Center for Disease Control and Prevention (2015) Household water treatment www.cdc.gov/healthwater/drinking/problic/watertreatment.htm/ Retrieved 10/07/15.

Centers for Disease Control and Prevention (2014). The safe Water System www.cdc.gov/safewater/storage/htm/ Retrieved 10/07/15.

Environmental Health Practitioner Manual (2010). A Resource Manual of Environmental Health Practitioners Working with Aboriginal and Torres strait Islander Communities. The importance of Water. http://www.health.gov.au/internet/pubications/publishings.nsf/content/ohpenhelath-manual-atsi-cnt-/-enhealth-manual-atsi. Retrieved 07/07/15.

Fawell, J. & Nieuwenhuijsen, M.J. (2015) Contaminants in drinking water. British Medical Bulletin 68(1) 199-208 bmb.oxfordjournals.org/content/68/1/199.full. Retrieved 10/07/15.

Global Water Partnership. (2009). Global Water Security www.gup.org/Global/Activities/News/GWP-on-Watersecurity-Feb-2010.pdf?epslanguage.en. Retrieved 10/07/15.

Kathleen, M.Z. (2008). 6 Reasons to Drink Water www.webmd.com/diet/6-reasons-to-drink-water. Retrieved 10/07/15.

Mayo Foundation for Medical Education and Research. (2015). Nutrition and healthy eating www.mayochinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/water/art-20044256? Pg22. Retrieved 10/07/15.

Michel, J. (2013). Water Security and the Global Water Agenda. www.unwater.org/dowloads/watersecurity-analysticalbrief.pdf. Retrieved 09/07/15.

Native Intelligence Inc. (2015). Security Awareness www.nativeintelligence.com/ni-pregrams/whyaware.asp. Retrieved 08/07/15.

Science Daily. (2015). Water purification www.sciencedaily.com/terms/water-puritfication.htm. Retrieved 10/07/15.

Smart, T. (2015). Security dictionary. Cambridge.org/dictionary/british/security. Retrieved 07/07/15.

The United Nations Inter-Agency Mechanism on All Freshwater. (2014). Water Security www.unwater.org/topics/water-security/en/ Retrieved 08/08/15.

World Health Organization. (2015). Household Water Treatment and safe storage www.who.int/howsehold-inter/en/ Retrieved 10/07/15.

World Health Organization. (2015). Safe household water storage ww.who.int/household-water/research/safe-storage/en Retrieved 10/07/15.

World Water Assessment Programme (WWAP). (2012). The United Nations World Water Development Report 4: Managing water under unurtainty and Risk, Paris, France. UNESCO.