THE INTERNATIONAL JOURNAL OF SCIENCE & TECHNOLEDGE

Knowledge, Attitude and Practices of Sachet Water Quality in Nnewi, Anambra State, Nigeria

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Abstract:

The proliferation and demand for sachet water is on the increase due to astronomical increase in human population and lifestyle choices. The study analyzed the knowledge of sachet water quality, attitude towards sachet water quality and practices towards improving sachet water quality. The study assessed using questionnaire the knowledge, attitude and practices of sachet water quality in Nnewi. The result showed that 35% of the respondents in Nnewi agreed that sachet water in the area is produced in a hygienically-sound environment while 35% of the respondents agreed that sachet water in the area is stored in hygienically-clean environment. The result showed that 91.67% of the respondents agreed that sachet water production and distribution should be improved through policy formulation while 91.67% of the respondents agreed that sachet water production and distribution should be improved through environmental education of the producers. Ninety percent of the respondents in Nnewi agreed that sachet water production and distribution in the area should be improved through environmental education and enlightenment of the consumers. The study recommended the enactment of relevant laws on drinking water quality since a number of the respondents disagreed that there are available laws on sachet water of good quality.

Keywords: Attitude, knowledge, Nnewi, practices, quality, sachet water

1. Introduction

Water is an essential part of human nutrition and is required for maintenance of personal hygiene, food production and prevention of disease (Thliza *et al.*, 2015). It is the most abundant substance in nature and occupies about 70% of the earth's crust (Anyamene and Ojiagu, 2014; Thliza *et al.*, 2015). A reliable supply of clean wholesome water is highly essential in a bid to promote healthy living among the inhabitants of Nnewi in addition to being key to sustainable development, health, food production and poverty reduction (Balogun *et al.*, 2014). In many developing countries (like Nigeria) however, availability of clean water has become a crucial and urgent problem becoming a matter of concern to families and communities (Maduka *et al.*, 2014). It is estimated that 1.2 billion people around the world or one fifth of the world's population lack access to safe drinking water either because of unavailability or inadequacy (Oyelude & Ahenkorah, 2012; Lubberding, 2006). This could probably be due to increase in human population (Maduka *et al.*, 2014) or because potable water now attracts increased rates and fees which many cannot due to poverty (Oyelude & Ahenkorah, 2012) or because of rapid industrialization, urbanization and new uses of treated water (Mojekeh & Eze, 2011).

A Knowledge, Attitude and Practices (KAP) survey is a quantitative method (predefined questions formatted in standardized questionnaires) that provides access to quantitative and qualitative information (SPRING, 2011). KAP surveys reveal misconceptions that may represent obstacles to the activities that we would like to implement and potential barriers to behaviour change (SPRING, 2011). KAP surveys provide information on people's reasons for specific attitudes, acceptance or rejection of specific products and programmes (Kumekpor, 2002). The KAP survey as used in this study elicited information on people's perception on knowledge indices, behavioral approaches (attitude) and what can be done to effect changes in prevailing attitudes and practices towards the production, distribution and consumption of sachet water in Nnewi. In Nigeria, knowledge of quality assessment (K), attitude towards sachet water quality (A) and practices towards improving sachet water quality (P) is a sound practice in water quality management. The need for information on KAP indices as enumerated in this study necessitated the development and extensive use of this specific type of survey in developing countries like Nigeria. This survey has been used in identifying profiles of the population expressing specific attitudes towards sachet water quality such as checking for hygiene of production/storage before sachet water consumption; closure of sachet water-producing companies because of questionable water quality, preference for sachet water consumed because of availability, convenience, affordability, cleanliness, proximity. Similarly, this survey has been used in identifying profiles of the population having a certain level of knowledge on water quality assessment such as reason for choice of sachet water consumed, including odourlessness, tastelessness, colourlessness, availability, possession of NAFDAC number; sachet water of questionable quality can cause water-related diseases.

Further, this survey has been used in identifying approval (agree) or disapproval (disagree) of practices towards improving sachet water quality such as environmental problems emanating from sachet water production and distribution; sachet water production and distribution in Nnewi should be banned, remain at status quo, improved through policy formulation, improved through environmental education and enlightenment of the producers and consumers. The aim of this study is to evaluate the knowledge of quality assessment, attitude towards sachet water quality and practices towards improving sachet water quality (KAP) of the residents in Nnewi. This evaluation will guide the development of framework for improving sachet water quality in Anambra State, Nigeria.

2. Materials and Methods

2.1. Study Area

Nnewi is located between latitudes 5°06'N and 6°05'N and longitudes 6°51'E and 6°57'E in Anambra South Senatorial District of Anambra State. It has a human population of about 233,658 persons and covering 72 square kilometers (UN-HABITAT, 2009).

2.2. Sample Size

Estimation of the sample size was done to ensure the minimum number of respondents needed to be a representative sample for the whole population of Nnewi North local government area. The sample size was determined using the Taro Yamane formula for determination of population size. This formula assumes a degree of variability of 0.05 and a confidence level of 95%. The calculated sample size was 120.

2.3. Collection and Distribution of Questionnaire

The study was conducted between July 2016 and December 2016 in the low, medium and high-density areas of Nnewi North local government area. A total of one hundred and twenty (120) copies of questionnaire were distributed and analyzed for respondents' perception/views. The researcher elicited information from the respondents by way of interviewing. Responses were elicited from residents in Nnewi by adopting a purposive sampling method for the questionnaire distribution.

2.4. Data Analyses

Percentages were used to display respondents' views on knowledge of quality assessment (K), attitude towards sachet water quality (A) and practices towards improving sachet water quality (P) (KAP survey). These responses were assessed using a three-point likert scale of Agree (A), No Opinion (NO) and Disagree (D). Statistical Package for Social Sciences (SPSS) software version 16.0 was used for data analyses. Initially, all information gathered via questionnaire was coded into variables and then analyzed. Mean separation was done using Duncan Multiple Range Test. For each test, a P-value of less than 0.05 was considered statistically significant.

3. Results and Discussion

The survey on knowledge, attitude and practices (KAP) was conducted in Nnewi North local government area. From the results, most of the respondents have attained tertiary education and close to this average have acquired SSCE qualifications. This therefore implies that the results obtained from these respondents are accurately provided. Majority of the respondents' occupation require them to make good use of water in their daily activities.

S/N		Percentages (%)			P-value
		A	NO	D	
1	Choice of type of drinking water consumed				
	Availability	79.17	5.83	15.0	0.999 ^{ns}
	Affordability	66.67	10.83	22.5	0.995 ^{ns}
	Cleanliness	65.0	10.0	25.0	0.989 ^{ns}
	Quality	79.17	6.67	14.17	1.000 ^{ns}
2	Choice of type of sachet water consumed				
	Odourless	97.5	2.5	0.0	1.000 ^{ns}
	Tasteless	97.5	2.5	0.0	1.000 ^{ns}
	Colourless	97.5	2.5	0.0	1.000 ^{ns}
	Contains NAFDAC number	78.33	5.0	16.67	0.992 ^{ns}
	Availability	77.5	5.83	16.66	0.996 ^{ns}
3	Sachet water brands have reliable quality?	83.33	10.0	6.67	0.998 ^{ns}
4	Sachet water brands have NAFDAC number?	92.5	2.50	5.0	0.999 ^{ns}
5	Sachet water brands have expiry dates?	15.84	5.83	78.34	0.978 ^{ns}
6	Sachet water brands are produced in hygienically-sound environment?	35.0	6.67	58.34	0.962 ^{ns}
7	Sachet water brands are stored in hygienically-clean environment?	35.0	6.67	58.33	0.956 ^{ns}
8	Sachet water of questionable quality can cause water related diseases?	83.34	6.67	10.0	0.998 ^{ns}

Table 1: Knowledge of Quality Assessment (K)

Key: A = Agree; NO = No Opinion; D = Disagree; Ns = Not Significant

Table 1 above displays the results of the respondents in Nnewi on knowledge of quality assessment (K). This study found out that respondents in Nnewi ascribe their preference for the choice of drinking water to availability, reliable quality, affordability and hygienically-clean environment. The reason for this finding is that drinking water is accessed when it is available, affordable, clean and of reliable quality.

The study found out that respondents in Nnewi ascribe their preference for the choice of sachet water brands consumed to odourlessness, tastelessness, colourlessness, possession of NAFDAC number and availability. The reason for this finding is that sachet water is consumed when it is deficient of organoleptic properties of odour, taste and colour.

Majority of the respondents in Nnewi agreed that sachet water brands have reliable quality and NAFDAC number. The reason for this finding is that possession of NAFDAC number which assures sachet water quality is a pre-requisite to sachet water production.

The study found out that majority of the respondents in Nnewi disagreed that sachet water brands in the area have expiry dates. The reason for this finding is that expiry dates of sachet water brands are usually not stamped on these brands.

The study found out that 35% of the respondents in Nnewi agreed that sachet water brands are produced in hygienically-sound environment and stored in hygienically-clean environment. The reason for this finding is that sachet water brands are produced and stored in a clean environment.

The study also found out that majority of respondents in Nnewi agreed that sachet water brands of questionable quality can cause water-related diseases. The reason for this finding is that there is scientific evidence linking the consumption of sachet water of poor quality to water-related diseases such as diarrhea and typhoid.

S/N		Percentages (%)			P-value
		A	NO	D	
1	People look for NAFDAC number of sachet water before purchase?	49.17	2.50	48.33	0.911 ^{ns}
2	People check for expiry dates of sachet water before purchase?	49.17	2.50	48.33	0.921 ^{ns}
3	People check for batch number of sachet water before purchase?	49.16	1.67	48.33	0.920 ^{ns}
4	People insist on buying particular sachet water brands always?	55.0	6.67	38.33	0.907 ^{ns}
5	People check for hygiene of production/storage before consuming sachet water brand?	45.0	4.17	50.83	0.995 ^{ns}
6	People can go far distance to look for a particular sachet water brand?	55.0	6.67	38.34	0.920 ^{ns}
7	People ensure that any brand consumed is:				
	Odourless	97.5	2.5	0.0	1.000 ^{ns}
	Tasteless	97.5	2.5	0.0	1.000 ^{ns}
	Colourless	97.5	2.5	0.0	1.000 ^{ns}
8	Some sachet water brand-producing companies have folded because of questionable water quality?	64.17	6.67	29.16	0.999 ^{ns}
9	People prefer to consume sachet water these days because of:				
	Availability	85.83	4.17	10.0	0.995 ^{ns}
	Convenience	80.0	5.0	15.0	0.999 ^{ns}
	Affordability	68.33	6.67	25.0	0.937 ^{ns}
	Cleanliness	76.67	5.83	17.5	1.000 ^{ns}
	Proximity	69.17	6.67	24.17	0.957 ^{ns}
10	Sachet water wastes are properly managed in the area?	11.67	6.67	81.67	0.990 ^{ns}
11	People blame water-related diseases on ingested sachet water?	86.67	2.50	10.84	0.999 ^{ns}

Table 2: Attitude towards Sachet Water Quality (A)

Key: A=Agree; NO=No Opinion; D=Disagree; Ns=Not Significant

Table 2 above displays the results of the respondents in Nnewi on attitude towards sachet water quality (A). This study found out that majority of the respondents in Nnewi check for NAFDAC numbers, expiry dates and batch numbers of sachet water brands before purchase. The reason for this finding is that possession of NAFDAC number is a pre-requisite to sachet water production activities.

The study found out that majority of the respondents in Nnewi insists on buying particular sachet water brands always. The reason for this finding is that sachet water of good quality usually marks the trend of the business of sale of sachet water brands.

The study found out that majority of the respondents in Nnewi check for hygiene of production/storage of sachet water brands before consumption. The reason for this finding is that hygiene consideration for production and storage of sachet water brands is important before consumption.

The study found out that majority of the respondents in Nnewi can go a far distance to look for a particular sachet water brand. The reason for this finding is that sachet water of good quality usually compels its search by consumers.

The study found out that majority of the respondents in Nnewi agreed that they ensure that sachet water brands consumed is odourless, tasteless and colourless. The reason for this finding is that many ensure that sachet water consumed is deficient of the organoleptic properties of odour, taste and colour.

The study found out that majority of the respondents in Nnewi agreed that sachet water brand-producing companies have folded because of questionable water quality. The reason for this finding is that production of substandard sachet water can put her producers out of business.

The study found out that respondents prefer to consume sachet water brands these days because of availability, convenience, hygienically-clean environment, proximity and affordability. The reason for this finding is that sachet water brands are consumed because they are available, affordable and clean.

The study found out that majority of the respondents in Nnewi disagreed that sachet water wastes in the area are properly managed. The reason for this finding is that sachet water wastes constitute a significant part of solid waste menace in Nnewi.

The study found out that majority of the respondents in Nnewi attribute water-related diseases on ingested sachet water brands. The reason for this finding is that there is scientific evidence linking consumption of sachet water of questionable quality to water-related diseases.

S/N		Percentages (%)			P-value
		A	NO	D	
1	Raising alarm over poor quality	70.83	5.83	23.33	1.000 ^{ns}
2	Available laws to promote good quality	58.33	5.0	36.67	0.994 ^{ns}
3	Periodic monitoring of quality	52.50	4.17	43.34	0.981 ^{ns}
4	Resultant environmental problems				
	Waste generation	62.50	12.50	25.0	1.000 ^{ns}
	Noise pollution	30.0	9.17	60.84	0.870 ^{ns}
	Environmental degradation	39.17	7.50	53.34	0.643 ^{ns}
5	Sachet water production and distribution in the area should be:				
	Banned	3.34	5.0	91.66	0.999 ^{ns}
	Allowed to be continued where it is	58.34	8.33	33.33	0.658 ^{ns}
	Improved through policy formulation	91.67	4.17	4.17	0.999 ^{ns}
	Improved through environmental education of producers	91.67	4.17	4.17	0.999 ^{ns}
	Improved through environmental education of consumers	90.0	6.67	3.34	1.000 ^{ns}

Table 3: Practices towards Improving Sachet Water Quality (P)

Key: A=Agree; NO=No Opinion; D=Disagree; Ns=Not Significant

Table 3 above displays the results of the respondents in Nnewi on practices towards improving sachet water quality (P). The study found out that majority of the respondents in Nnewi agreed that they raise alarm over sachet water brands of poor quality. The reason for this finding is that the stimulus of action (substandard sachet water) determines the response to its effect (raising alarm).

The study found out that majority of the respondents in Nnewi agreed that there are available laws/policies on how to ensure that sachet water brands in the area are of good quality. The reason for this finding is that there are a number of laws on drinking water quality such as the Anambra State Government State Water Supply and Sanitation Policy.

The study found out that majority of the respondents in Nnewi agreed that qualities of sachet water brands in the area are constantly monitored. The reason for this finding is that routine monitoring of sachet water qualities takes place in Nnewi.

The study found out that majority of the respondents in Nnewi agreed to waste generation as a major result of sachet water production and distribution activities in the area. The reason for this finding is that sachet water wastes constitute a significant part of solid waste menace in Nnewi.

The study found out that majority of respondents in Nnewi disagreed to noise pollution and environmental degradation as major consequences of sachet water production and distribution activities. The reason for this finding is that sachet water production and distribution activities neither generate high noise levels nor result in significant environmental degradation.

The study found out that a significant percentage of the respondents in Nnewi agreed that sachet water production and distribution in the area should be improved through policy formulation, environmental education and

enlightenment of the producers and consumers. The reason for this finding is that there is a recommendation that environmental education be used as a tool for improving sachet water production and distribution activities.

4. Conclusion

In line with the objectives of this study, drinking water supplies should be available, affordable, of good quality and produced in a hygienically-clean environment since most of the respondents in Nnewi ascribe the choice of drinking water to availability, affordability, production in hygienically-clean environment and reliable quality. Since majority of Nnewi respondents said that production of sachet water in a hygienically-clean environment influence their choice of drinking water, suitable rainwater harvesters and other clean drinking water techniques should be availed to the residents of Nnewi. Responsible regulatory agencies should ensure that expiry dates are stamped on sachet water brands consumed in Nnewi in view of the fact that respondents say that sachet water brands in the area do not have expiry dates. Sachet water regulatory agency (NAFDAC) should ensure that sachet water brands are produced and stored hygienically in line with disagreement by Nnewi respondents that these brands are produced and stored hygienically.

5. Recommendations

The following were recommended for this study:

- Since most of the respondents disagreed that sachet water wastes in Nnewi are properly managed, Anambra State Waste Management Agency (ASWAMA) should step-up solid waste management approaches (of which sachet water is a part) so that sachet water wastes will not generate wastes and the attendant environmental degradation emanating from these wastes.
- ASWAMA should carry out major sensitization activities to reverse the ill-effects on the environment of poor management of sachet water wastes in Nnewi since most of the respondents chose waste generation as a major consequence of sachet water production and distribution activities.
- Since most of respondents in Nnewi agree that some sachet water brand-producing companies have folded up because of questionable water quality, regulatory agencies should step-up their regulatory oversight function on these companies in order to enable them abide by standards and stay in the business of sachet water production and distribution.
- Furthermore, since respondents identified noise pollution and environmental degradation as major consequences of sachet water production and distribution activities, the responsible regulatory authority should step-up activities to forestall these impacts on the environment. The responsible authorities should step-up educative and enlightenment programs on adequate sachet water production and distribution activities since majority of the respondents in Nnewi recommend that sachet water production and distribution should be improved through environmental education of producers and consumers.
- Since respondents in Nnewi disagreed that the qualities of sachet water brands in the area are constantly monitored, NAFDAC should step-up routine surveillance on sachet water production and distribution in Nnewi. Since a number of the respondents in Nnewi disagreed that there are available laws on how to ensure that sachet water in Nnewi is of good quality, relevant laws on drinking water quality should be enacted and brought to the knowledge of residents through public awareness programs.

6. Acknowledgements

The researchers appreciate the statistician at Michael Okpara University of Agriculture Umudike (MOUUAU), Umuahia, Abia State, Mr. Gideon, whose expertise was used to analyze the respondents' views which results are presented in this study. I also thank my two supervisors, Prof. V.C. Nnodu and Prof. A.C. Okoye who supervised this work for my Master of Science Degree programme at the Nnamdi Azikiwe University, Awka. Special thanks also go to Dr. S. U. Onwuka for his great insights and guidance in this work.

7. References

- i. Anyamene, N.C. and Ojiagu, D.K. (2014). Bacteriological Analysis of sachet water sold in Awka Metropolis, Nigeria. *International Journal of Agriculture and Biosciences* 3: 120-122.
- ii. Balogun, S.A., Akingbade, A.O., Oyekunle, M.A., Okerentugba, P.O. (2014). Physicochemical and Microbiological profile of drinking water sold Abeokuta, Ogun State, Nigeria. *Nature and Science* 12:103-105.
- iii. Kumekpor, K.B. (2002). Research Methods and Techniques of Social Science Research. SonLife Printing Press & Services Accra, Ghana, 128-130.
- iv. Lubberding, H.J. (2006). Microbiology Lecture Notes. Microbiology and Water Supply.
- v. Maduka, H.C.C., Chukwu, N.C., Ugwu, C.E., Dike, C.C., Okpogba, A.N., Ogbueche, P.N., Maduka, A.A. (2014). Assessment of commercial table and sachet water commonly consumed in Federal University of Technology, Owerri (FUTO), Imo State, Nigeria using Microbiological indices. *Journal of Dental and Medical Sciences* 13:86-89.
- vi. Mojekeh, M.O. and Eze, P.A.O. (2011). The environmental impact of production and sales of sachet water in Nigeria. *African Research Review* 5:479-492.
- vii. Okpara, I.G. (2008). EUREKA: Our Sanitation Problem: Can the Sama-sama Reintroduction Provide the Solution, 2(2), 23-39.
- viii. Oyelude, E.O. & Ahenkorah, S. (2012). Quality of sachet water and bottled water in Bolgatanga Municipality of Ghana. *Research Journal of Applied Sciences, Engineering and Technology* 4, 1094-1098.

- ix. SPRING (2011). The KAP Survey Model (Knowledge, Attitudes and Practices). Strengthening Partnerships, Results and innovations in Nutrition Globally (SPRING) with support from the United States Agency for International Development (USAID).
- x. Thliza, L.A., Khan, A.U., Dangora, D.B. and Yahaya, A. (2015). Study of some bacterial load of some brands of sachet water sold in Ahmadu Bello University (Main Campus), Zaria, Nigeria. *International Journal of Current Science* 14: 91-97.
- xi. United Nations Human Settlements Programme (UN-HABITAT, 2009). Executive Summary of Structure Plans for Awka, Onitsha and Nnewi and Environs, 2009-2027. UN-HABITAT Regional and Information Offices, Nairobi, Kenya.