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RESEARCH ARTICLE

AWARENESS AND IMPORTANCE ATTACHED TO QUALITY PARAMETERS IN SACHET WATER PRODUCTION IN TAMALE METROPOLIS

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ABSTRACT

Set out to investigate the importance attached to quality of sachet water produced, the study used a sample of 215 respondents in the Tamale Metropolitan Area. The study established that, a significant number of producers of sachet water are not certified in the metropolis. It was also manifested from the study that, consumers of sachet water in the Tamale Metropolis are not sufficiently educated on their rights to information on the safety of sachet water sold in the metropolis. It further became apparent from the findings that sachet water consumers are aware of the existence of uncertified producers who violates regulations on consumer safety but are not aware of any available channel for such complaints to be made. In view of the findings, the study recommends that the regulators intensify their monitory activities and in collaboration with other relevant stakeholders engage the public in education to avoid uncertified sachet water.

INTRODUCTION

Water is noted to be a very crucial element in the life of not just only human beings but all living organisms and without it life on our planet will cease to exist (Alison, 2001). Notwithstanding its indispensability nature on earth, access to portable water for consumption has always been a topical issue of concern. It is observed that portable water is very crucial to the reduction of poverty and sustainable economic development and hence very eminent to the achievement of the Millennium Development Goals (MDG's) (UN Water News, 2007). This goes to reinforce the views of the Human Development Report (2006) that the enhancement of human dignity, creation of more opportunities in life for improved health and increased in wealth are hinged on access to portable water. It is in light of this need for portable water that led to the production of sachet water popularly known as "pure water" was introduced and both large and small scale enterprsies have gone into this business (Okioga, 2007). The main aim of sachet water introduction is to prevent the consumption of contaminated water by the public. It was aimed at providing hygienic, safe and affordable water to the public since many people cannot afford the bottled water in general (Kwakye-Nuako *et al*., 2007). Sachet water has therefore come to stay for good in Ghana as it enjoys a lot of patronage from consumers. However, researchers have raised a lot of questions about the purity of some of the sachet water produced (Ajayi and Adesida, 2009). According to Afiukwa *et al*. (2010), a lot of the sachet water produced are not fit for human consumption due to the bad sanitary standards. In a related study carried out in the Tamale Metropolis, Okioga (2007) established that 20% of sachet water produced in the Metropolis does not meet the standards of the Ghana Standard Board (GSB). In a similar research investigation on sachet water quality in Tamale, Okioga (2007) found that 20% of factory-produced sachet water in Tamale had turbidities greater than the limit set. The Food and Drug Board (FDB), a major regulator of the sachet water production in the country is said to have bemoaned the situation when it noted that a lot of unscrupulous business owners have taken an undue advantage of the consumers' high demand for the sachet water to inundate the market with unwholesome products (Adofo, 2011). This therefore means that these producers do not comply with the regulators guidelines or the regulators do not even attached seriousness on the conformity with their guidelines. The danger of drinking water that transmit microbial pathogens to great number of people causing subsequent illness is well documented in many countries at all levels of economic development (Dufour *et al*., 2003). Water-related diseases, linked to inadequate access to safe water and

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basic sanitation, are endemic in many regions. There are 4 billion cases of diarrhea each year, causing 2.2 million deaths which translate into about 5,000 deaths daily. Children under the age of five are mostly the victims. One million children die each year from malaria, filariasis, bilharzias, intestinal worms and other water-related diseases (World Water Day, 2007). Okonski (2009) concurred with the disastrous consequences of contaminated water. He noted that, dirty water can transmit parasites, bacteria and viruses and can inhibit sanitation, resulting in millions of cases of water borne diseases. Water and health are intimately linked. Water conveys pathogens to people, and provides the habitat for vectors and intermediate hosts of pathogens. Shortages of water coupled with inadequate sanitation expose families to contracting water borne diseases. Diseases associated with water affect the poor in a disproportionate way than the rich and the burden of ill health perpetuates the vicious cycle of poverty. It is against this background this study is designed to determine the awareness and importance attached to quality check parameters by all the stakeholders in the sachet water industry in the Tamale metropolis. This study is very relevant as it will fill the literature gap in the subject matter in Tamale. There are a lot of studies carried out on the sachet water production in the area but to the best of our knowledge all of them focused on the determining the water purity. However, this study is placing emphasis on the importance the regulators and producers attached to the quality parameters and whether or not consumers are have awareness on the state of the water produced and their rights as consumers. The study will therefore be guide for policy makers to direct their efforts very well at flushing out all the unscrupulous sachet water producers in the area and Ghana as whole.

Research Questions

1. What level of importance do regulators and producers attach to the parameters for assessing the quality of sachet water?
2. What are the levels of consumer awareness of safety requirements of sachet water produced in the Tamale Metropolis?

REVIEW OF RELATED LITERATURE

International Law on Consumer Protection

The United Nations is the vanguard for protecting consumer rights world-wide. This is amply demonstrated through the provision of United Nations guidelines for consumer protection (2003). The guidelines uphold and espouse the ideals and principles of consumer rights. The cardinal objective is to protect the interest and needs of consumers in all countries particularly those in developing countries where consumer rights are treated with contempt. Section 56 of the UN guidelines on consumer protection stipulates that, in advancing consumer interests, particularly in developing countries, governments should give priority to areas of essential concern for the health of the consumer, such as food, water and pharmaceuticals. Section 59 imposes a duty on governments to formulate, maintain or strengthen national policies within the goals and targets set for the International Drinking Water Supply and Sanitation Decade to improve the supply, distribution and quality of water for drinking. Sections 56 further indicates that policies should be adopted and maintained for product quality control, adequate and secure distribution facilities, standardized international labeling and information, as well as education and research programmes in these areas.

Regulatory Bodies and Consumer Protection

The two organizations that have express mandate within the purview of statutory laws in Ghana are the Food and Drugs Board (FDB) and the Ghana Standards Board (GSB). The two bodies have the relevant powers to monitor and determine the quality standards of all products, consumables and non-consumables supplied in the market or for export. Legislations that go to give backings and support to these Boards are; the Ghana Standards Decree, the Food and Drugs Law, the Pharmacy Act, and the Narcotics Drugs (Control, Enforcement and sanctions) Law.

The Ghana Standards Board

The Ghana Standard Board was established by the Standards Decree 1967, NLCD 1999 with the core mandate of standardisation and quality assurance of goods and services for both the local market and for export. This was superseded by NRCD 173 of 1973. The law empowers the Standards Board to establish and promulgate relevant standards with the object of ensuring high quality of goods produced in Ghana, for local consumption or for export, promote standards in the field of public and industrial welfare, health and safety. The standard mark or mark of conformity indicates that the product has been produced according to accepted standards. The mark assures consumers that the product has been inspected, tested and conforms to the requirements of an accepted standard. The mark assures consumers of quality, reliability, safety and value for money (Famiyeh-Addo, 2011). Only certified businesses are qualified to use the standard mark to label their products. It is important to establish the certification status of bagged potable water. Products that are duly certified by the GSB are periodically subjected to rigorous testing and scrutiny to help evaluate their quality and to ascertain whether safety standards have been adhered to (Famiyeh-Addo, 2011). The GSB mark of conformity is a mandatory requirement and indicates that products are of accepted standards thus giving assurance to consumers that such products have been inspected and tested for consumer safety (GSA, 2011).

The Food and Drugs Board

The Food and Drugs Board on the other hand was established by the Food and Drug Law 1992, PNDL 305B. Prior to 1990, the control of drugs and the practice of pharmacy profession were under the Pharmacy and Drug Act 64, 1961. The Food and Drugs Law has auxiliary powers with the Standards Decree of controlling the manufacture, importation, exportation, distribution, use, and advertisement of food, drugs, among others. The law establishing the Food and Drugs Board (FDB) significantly recognizes water in its definition of food. This is encapsulated in the interpretation section of the FDL 305B of 1992. In its broader interpretation food includes any article manufactured, sold or represented for use as food or

drink for human or animal consumption. Items such as chewing gum, water and any ingredient of the food, drink is therefore considered as food. By this definition, water is viewed in the eyes of the law, as food. Section 7 of the Act requires that whatever constitutes food should be preserved in a manner that its composition, quality and purity as well as the dissipation of its nutritive properties due to climatic and deteriorating conditions are minimised as possible. In view of the preservative requirements, section 48 of the FDL, empowers the FDB to formulate codes of practices to provide guidance to manufactures or producers of foods in the Ghanaian market for the safety of consumers. In fulfillment of this statutory requirement, the FDB (2006) formulated specific code of practice for the sachet water industry. The purpose of the code of practice is to ensure hygienic practices in the processing, packaging, handling and distribution of sachet water intended for human consumption. Besides the code of practice, the sachet water industry is also expected to comply with existing standard requirements in the country for the general safety of consumers. The FDB code of practice for sachet water manufacturing firms takes a critical look at the following areas: place for processing of sachet water, processing controls, storage areas, and transportation. Other areas of attention include personnel hygiene and health requirements, pest control systems, waste management as well as processing and production records. These among others constitute the fifteen parameters of the FDB's operational procedures. Sachet water producers are obliged to satisfy these requirements before they can acquire the Board's market authorization for producing sachet water.

Processing Controls

The FDB guidelines require sachet water manufacturing firms to ensure that filtration and ultraviolet light form an integral part of the treatment process of water to be packaged in sachet. Equally, equipment's use for the entire process should be operated and maintained in accordance with its manufactured specifications so as to prevent them from becoming a source of contamination. The filtration system, per the code of practice of the FDB is to include at least; Carbon and Activated Charcoal Filters (adsorption, absorption) to reduce or remove odour and/or taste producing substances or other undesirable substances that have bonding properties to a specific filtration media. Ultraviolet (UV) light should be provided to reduce or eliminate microbial load. Daddey-Adjei, the Volta regional boss of the Food and Drugs Board in a duty tour of sachet water manufacturing firms in the region highlighted the need for factory lines to ensure the presence of ultraviolet light (UVL) since the light helps to destroy germs during the production process (Kyei-Afrifa, 2008). The water manufacturing firms are mandated by law to develop standard operating procedures (SOP) which should be displayed to guide its staff in changing and maintenance of filters. Regular sanitation and cleaning activities as well as washing and disinfection of containers to ensure high quality of sachet water is required to be observed by all producers of sachet water as per section 3(2) of the code of practice of the FDB. Packaging of products and handling is as important as the manufacturing process. Improper handling of sachet water may as well be potential source of contamination. To minimize contamination, prevent damage and accommodate proper labeling, the FDB requires firms to ensure that packaging machines and materials provide adequate protection for the products. Ink used for labeling must not pave way for flake or rub-off on handling and should not affect the safety and suitability under specific storage conditions and usage.

Pest Control Systems

Proper pest control practices should be adopted in a manner which will not adversely affect the safety or suitability of the water. Open windows, doors and ventilators, holes, drains and other places where pests are likely to gain access should be kept sealed with wire mesh screens. Management of sachet water Companies are required by Food and Drugs Board law to keep factory premises clean of cobwebs. The doors to the factory premises should be fastened properly to prevent flies from entering (Afrifa, 2008).

Waste Management

Premises of firms for the manufacture of sachet water per the FDB codes, is to be devoid of accumulation of waste substances to guarantee safety and quality of the water produced. Also, suitable provision is required to be made available for the collection and removal of waste substances to forestall contamination.

Sanctions and penalties of the food and drugs board

The codes of practices are binding on all individuals and firms engaged in the manufacturing of sachet water in the country. Appropriate sanctions and penalties are applied for violations of the law in accordance with the relevant sections of the FDL 1992 (PNDL 305B). Officials of the FDB in their bid to inject some sanity and discipline in the operations of sachet water firms sometimes carry out snap checks to bring non-compliant producers to book. Boadu (2012) posited that the FDB is clothed with powers to impose administrative fines on companies whose actions contravene the rules and regulations of the board. Adofo (2011) opined that, a sum of 48 producers of sachet water in the Greater Accra Region have been shut down by the FDB. The reasons that accounted for the FDB sanctions were failure to meet required standards and producing under unwholesome environments. The FDB and GSB are mandated by law to seize and destroy food items or any commodity deemed to constitute a health hazard to consumers. A total of about 620 sacks of unwholesome water were seized and destroyed by officials of the FDB in some parts of the Volta region of Ghana. In same operation, the management of Kristar Filtered Water in Ho, received orders to stop production until the company secures the necessary certification to do business (Afrifa, 2008). This scenario points to the fact that there are several sachet water firms briskly doing business in the underground economy at the blind side of officialdom.

Parameters for determining the quality of sachet water

Sensory characteristics of good quality water

The sensory characteristics of good quality water are colourless, odourless, tasteless and clearness. Famiye-Addo

(2011) reports that the standard provisions on sachet water quality expect the water to have the required sensory features such as colourless, odourless and tasteless. In the light of these, sachet water that lacks these sensory requirements may not be good enough for human consumption.

Personnel hygiene and health requirements

Persons seeking for employment to be engaged in the production, packaging, handling and distribution of sachet water should be medically certified fit to handle food prior to employment. All workers of sachet water manufacturing firms are required to have medical validations to clear them of any communicable diseases as stipulated by law (Kyei-Afrifa, 2008). All such persons so certified to be engaged in the various activities of the sachet water manufacturing should be given adequate and continuous training on personal hygiene practices. This requirement is captured in section 3(5) of the FDB code of practice. They are further required to thoroughly and frequently wash their hands before commencement of work, or do so after using the toilet and upon having contact with other foreign materials. For manufacturers to properly monitor hand washing, notice indicating when hand washing is mandatory should be displayed as a guide and reminder for employees. Protective clothing should be used and all forms of unhygienic practices should be avoided.

Premise for sachet water production, storage and packaging

Where production, storage and packaging takes place, the floors and walls are required to be of water proof, non-absorbent, washable and devoid of non-toxic materials. They are expected to be easy to clean and disinfect. Sufficient light should be provided for appropriate operation. These provisions are all geared towards reducing possible contamination. Ceilings and windows per the FDB codes are to be designed, constructed and finished so as to prevent the accumulation of dirt and to minimize condensation, mould development and flaking and for easy cleaning. Doors are to be self-closing and close fitting. Ventilation openings should be equipped with close fitting screens or filters to prevent the intake of contaminated air. Adequate ventilation is to be provided to prevent excessive accumulation of heat, ozone gas, condensation, and dust, and to remove any contaminated air. Product packaging and handling is just as important as the manufacturing process. Poor handling of sachet water may as well be a potential source of contamination. Dodoo *et al*. (2006) reported that about ninety percent (90%) of sachet water producers and vendors in an interview reported that they manually rubbed the polythene they used to bag water to open them for filling. With the soaring market demand for sachet water, it would not be far-fetched to imagine other crude and unapproved methods producers of sachet water employ in churning out their products for the consuming public. The rubbers used in packaging the water should be properly sterilized. Generally, the unhygienic manner in which sachet water products are hawked in the streets may also be sources of contamination (Addo *et al*., 2009). Kwakye-Nuako and colleagues in a research on a sample of sachet water found that vital information required for the protection of consumers was lacking on some of the water sachets. They also revealed that none of the brands of sachet water had batch numbers and all the packs had no records of the dates of manufacture. Contact addresses were, however, indicated on all the packs (cited in David, 2007). The plethora of research findings are a pointer to a gross violation of the principles of caveat emptor which requires sellers of products to disclose all known defects to buyers at the point of the contract of sale. This is evident in cases where producers bagged direct tap or pipe water without observing hygiene practices. The quest for making money at the peril of the lives of the consumers constitutes an eternal risk of spreading water related diseases.

Consumers awareness of sachet water safety requirements

A major challenge facing consumers of water is the issue of awareness about water quality and the risk of contracting diseases from drinking untreated water. Everyone likes clear water but the awareness that clear water may be unsafe for the health of consumers is often lost. Consumers have social and behavioural attitudes that influence their perceptions on the choice of water they drink (IFC, not dated). The high patronage and unbridled quest for sachet water is fueled by the perception that ordinary water is of inferior quality. On the contrary however, research findings have discounted this perception. Notable among these works include the works of Dodoo *et al*. (2006); Okioga (2007); Addo *et al*. (2009); Kwakye-Nuako *et al*. (2007); Obiri *et al*. (2003); Dufour, *et al*. (2003). A research carried out by Dodoo, *et al*. (2006) to determine the quality of sachet water in Cape Coast found that samples of twenty nine (29) brands tested over a five year period had forty five percent (45%) of contamination. The earlier findings by Dodoo and colleagues were corroborated by the research findings of Okioga (2007). Okioga in his study found that about forty seven percent (47%) of sachet water tested in Tamale Metropolis was contaminated by microbial bacteria. In another study Addo *et al*. (2009) tested 30 samples of sachet water from 10 different brands in Teshie - Nungua, a suburb of Accra, and found that about 37% of the water were not worthy of human consumption. In a similar fashion, Kwakye-Nuako, *et al*. (2007) established that the sachet water in circulation in the Accra Metropolis was contaminated.

This conclusion was arrived at as a consequence of a research carried out on 27 different brands of sachet water randomly purchased from different vendors in the metropolis. It was further found that 77% of the samples for the study contained effective pathogenic parasitic organisms which may be a potent source of contamination thus posing danger to human health (Kwakye-Nuako *et al*. 2007). Everpure, one of the leading sachet water manufacturing firms in Kumasi lodged official complaint with the police, FDB and GSB to investigate an allegation that the firm bagged its water from snake infested water storage tanks rendering the water unwholesome for human consumption (Domfeh, 2012). The discourse underlines the fact that most of the sachet water sold in the market fail to meet safety standards for the unsuspecting and gullible consumer. This assertion is supported by shocking revelation from the Ghana Chemical Society (GCS) that about 85% of the sachet water sold in the Ghanaian market is

contaminated and unfit for human consumption (Adofo, 2011). Obiri *et al*. (2003) in their study in Kumasi found that the sachet water in circulation is not a reliable source of safe drinking water to the inhabitants. The possible transmission of microbial pathogens to a significant number of people through drinking water with the ripple effect of causing subsequent illness is a common knowledge in several countries. This assertion is supported by the works of Dufour *et al*. (2003) who opined that, the potential of drinking water to transmit microbial pathogens to a significant number of people with the possible danger of causing illness is well documented in many countries at all levels of economic development. Similar studies conducted in south eastern Nigerian by Afiukwa *et al*., (2010) posits that majority of the sachet water distributed for sale is not of good sanitary quality for human consumption because of the presence of faecal matter which are resistant to treatment from different classes of antibiotics. In yet another study involving 15 different brands of sachet water produced in Akure in southeastern Nigeria, it was found that all the brands tested were not safe for human consumption (Ajayi and Adiseda 2009). These findings raise fear and apprehension in the minds of consumers of sachet water. The disastrous consequences of drinking contaminated water have far reaching effects on the health and wellbeing of consumers. Without any shred of doubt or contradiction, the research on the quality of sachet water is quite a worrisome situation. The analyses on the quality of sachet water from the different localities in Ghana have proven that sachet water do not meet the quality and safety standards of consumers. In spite of these failures, sachet water producers seem to have a field day. The business is driven by profit motives much to the detriment of the welfare of consumers. The rights of consumers are trampled upon with impunity while state institutions tasked to regulate the market watch on with a posture of despondency.

Role of Consumers in the Protection of their rights

The high demand for sachet water has unfortunately resulted in a number of unscrupulous individuals flooding the market with substandard products putting the health of unsuspecting individuals at risk. However, there is a lot the consumer can do to protect his or her health and also help rid the market of substandard products. Being quality conscious and avoiding substandard goods is enough to cause the failure of such products on the market (Famiyeh-Addo 2011). It stands to reason that the GSB need the collaboration of the public to deal with firms and individuals for nonobservance of regulation. The staffs of the Ghana Standards Board are constrained in many respects in the performance of their statutory duties. Offices of these institutions are located mainly in the regional capitals. Their presence in the districts is virtually non-existent. This situation makes monitoring of the establishment of sachet water firms a daunting task. Generally, the public ought to support these state institutions by volunteering information on the existence of any recalcitrant producers without authentic certification. Unfortunately, this seems not to be the case. Folley (2012) bemoaned the situation by taking a swipe at the general public for their unwillingness to provide adequate information on product complaints and other non-compliant activities. Twum (2011) exhorted consumers to make their complaints on poor product quality known to the producers as well. In the view of Twum such complaints serve as alarm bell to producers and a call for action to remedy. Twum further notes that product complaints serve as a weapon to arm consumers to proceed to the next level of seeking redress in case of inaction by producers. Addo *et al*. (2009) have however highlighted the need for consumer education to patronize products from manufacturers who have obtained the right certification and licensing to produce water and whose product bears the logo of the Food and Drugs Board of Ghana. Sachet water is the craze for consumers and for producers it is a lucrative business for money making.

The grave danger is the health risk the consuming public is exposed to, thus the need for stringent steps to be taken to address the critical issues of public health (Addo *et al*., 2009). The number of outbreaks of water borne diseases that have been reported throughout the world gives ample testimony that the transmission of pathogens by drinking water remains a significant cause of illness (Addo *et al*., 2009). The call is most justified in the face of the fact that only 300 registered sachet water firms were in operation vis-à-vis an unregistered number of 600 in Ghana as at 2005 (Lindsay, 2005). The regulating authorities seem to be overwhelmed in the circumstance and therefore require human and logistical support to sustain the fight to sanitize the system. Crisis in the urban water sector in Ghana has created the enabling business environment for the proliferation of sachet water firms over the last few years (Sachet Water Project, 2009). Consumers normally purchase sachet water without any knowledge of the quality of its contents. Unknown to consumers, the sachet water they consume could be a possible source of contracting diseases both from its contents and the container. It is in the light of consumer safety that Sachet Water Project (2009) has committed itself to calls for the best way of addressing the sachet water menace. The goal is to ensure that the harmful effect of the use of sachet water is minimized to the barest by undertaking research on sachet water.

RESEARCH METHODOLOGY

Sample Size

The sample for the study comprised thirty (30) producers of sachet water, 20 staffs of the FDB and the GSB and 200 consumers of sachet water, all in the Tamale Metropolis. Given the respective samples, 30, 20 and 200 questionnaires were respectively distributed to the producers, regulators and consumers of sachet water. However, 27, 18 and 170 questionnaires were retrieved from each of the producers, regulators and consumers in that order. The return rate represents 86% of the total respondents.

Sampling Techniques

David and Sutton (2004) are of the view that the representativeness of a sample is a product of the sampling technique hence a simple random sampling technique was used to select the communities within the three constituencies of the metropolis. The simple random sampling technique gives an

equal chance for all the communities within the Metropolis to be selected for the study (Sarantakos, 2005).

Data Collection Instruments

The instruments for the study were of quantitative dimensions. They are made up of closed ended questionnaires that were designed to reflect the research objectives that elicited responses from the sachet water producers, consumers and regulators.

Validity and Reliability of the Instruments

Best and Khan (1998) expressed the opinion that validity and reliability are very essential to the effectiveness of any data gathering procedure. While reliability ensures consistency of the research instrument, validity on the hand defines the appropriateness, meaningfulness and usefulness of specific inferences made from the instrument (Gall, *et al*., 1996). The study incorporated the procedures of content and construct validity in refining the research instrument. The claim to content validity was guaranteed through the examination of the survey instruments by the supervisor of the research work. Participants in the pilot-testing of the instrument made useful comments on the clarity of questions which were taken into due consideration.

Pilot-testing of the Instruments

There is an emerging consensus among researchers that, piloting questions on a small sample of respondents drawn from the target population is more useful in uncovering aspects of the questions that would make it difficult for respondents to interpret questions as intended (Foddy 1995). Several writers, including (Best and Khan, 1998; Gall *et al*., 1996 and Glesne, 1999) have advocated the pilot-testing of a survey instrument prior to its delivery to participants. In line with the views expressed, the instrument was pilot-tested in the Kukuoamd Kalpohini sections of the Tamale Metropolis. Pilot-testing of the instrument was to help determine whether the questions were appropriate to meet the purpose of the study. Reliability of the survey instrument was confirmed by examining the individual test items using the Cronbach's alpha coefficient test (Gall *et al.,* 1996). The reliability of the instrument as per the Cronbach Alpha coefficient from the pre-test was 0.85. The Cronbach's alpha coefficient measures the internal consistency of reliability of the individual questions for a study. The Cronbach's alpha coefficient was deemed appropriate because the items in the questionnaire were multiple scored items. "Cronbach's alpha is used when measures have the same number of multiple scored items" (Ary *et al*., 1990, p. 235).

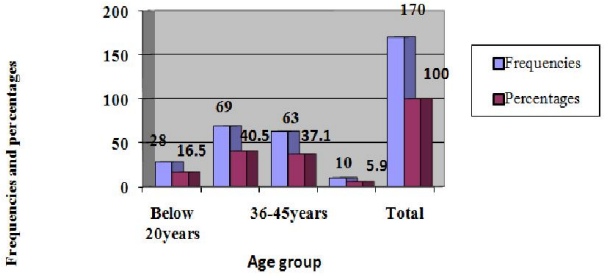
Data Processing and Analysis

The data were processed with the aid of the Statistical Package for the Social Sciences and presented for analysis and discussion in tables, bar graphs, frequencies, percentages, means and standard deviations.

DATA PRESENTATION AND ANALYSIS

Demographic Characteristics of Respondents of Sachet Water Consumers

From Figure 4.1.1 below indicates the age brackets of respondents.



Source: Authors' Construct

Figure 4.1.1. Age distribution of respondents

It can be gleaned from Figure 4.1.1 that the majority of the respondents were between the ages of 21–25 and 36–45 constituting 77.6%. The least number of respondents were 10 who fell in the age group of 46 and above. The composition of the age group of the respondents is an indication that, majority are within the active working population of the country. This implies that if the sachet water they consume is a threat to their health and survival, it put the future of the country in a blur situation. This necessitates immediate and prompt actions to be taken by the relevant authorities to help save the future of the country. Table 4.1.2 provides summary of information on the respondents based on their level of education.

Table 4.1.2. Level of education of respondents

Level of education	Frequency	Percent (%)
Tertiary	29	17.1
Secondary	34	20.0
Basic	66	38.8
Illiterate	41	24.1
Total	170	100.0

Source: Authors' Construct

The data in Table 4.1.2 depicts that a greater percentage of the respondents had some level of education. The respondents with tertiary, secondary and basic level of education cumulatively constitute 129 representing 75.9%. The implication for the findings of the study is that majority of the respondents could read and should be able to identify registered and unregistered features of sachet water in the metropolis in order to help rid the market-off unregistered producers. Figure 4.1.3 presents data on the length of period of patronage of sachet water in the Tamale Metropolis. From Figure 4.1.3 it can be seen that the majority of respondents reported that they have been using sachet water ranging from a period of 4 – 8 years. Interestingly, only a paltry of 6 respondents constituting 3.5% had used sachet water for about 13 years or more. This confirmed the growing proliferation of the sachet water business and the corresponding high

patronage by consumers Kwakye-Nuako *et al*. (2007) and Addo, *et al*. (2009). Given the growing patronage of the sachet water products over the years, the industry has future prospects for entrepreneurs.

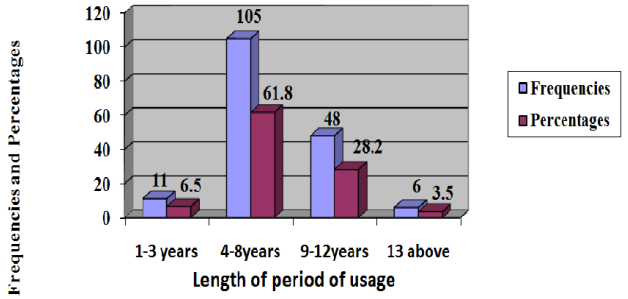


Figure 4.1.3. Length of usage of sachet water

Parameters for Assessing the Quality of Sachet Water

Simple frequencies were used to generate the needed data to answer the research question. Table 4.2.1 below presents the summary of data required to answer the research question on the level of importance regulators and producers attached to the parameters for determining the quality of sachet water.

Table 4.2.1 indicates that all the eighteen (18) regulators expressed the opinion that packaging was very important in the sachet water industry. Twenty (20) of the producers were however of the opinion that packaging was very important. Another seven (7) of the producers indicated that packaging was important in bagging sachet water. It can also be seen from the Table that the regulators unanimously indicated that the package for sachet water should have labeling on the manufacturing and expiry date of sachet water. The producers equally stated that the indication of the date of manufacturing and expiry was very important. The provision of these details on the pack will make it possible for consumers to tell the shelf-life and safety of the product (Famiye-Addo 2011). Even though the producers subscribed to the importance of providing these dates most of the sachet water sold in the Tamale metropolis are without this vital information. The prevailing situation in Tamale is akin to the findings of Kwakye-Nuako *et al*. (2007) who in their research found that such vital information required were absent in the brands of sachet water examined. Both the regulators and producers overwhelmingly endorsed the importance of providing information on the batch number and name of manufacturer. Contrary to the endorsement, Kwakye-Nuako *et al*. (2007) and Ofori-Adjei, (2007) discovered the non-availability of batch numbers and dates of manufacture in samples of sachet water used in their studies. While the absence of the name of manufacturer shows lack of responsibility and commitment on the part of the

Table 4.2.1. Level of importance of the parameters for sachet water quality determination

Parameter	Regulators			Producers		
	Very Important	Important	Unimportant	Very Important	Important	Unimportant
Packaging	18	0	0	20	7	0
Manufacturing date	18	0	0	19	8	0
Expiry date	18	0	0	17	10	0
Batch number	18	0	0	10	17	0
Name of producer	18	0	0	27	-	0
Producer address	18	0	0	14	13	0
Name of product	18	0	0	27	-	0
Standard mark/logo	18	0	0	18	9	0
Water storage	18	0	0	20	7	0
Hygiene of workers	18	0	0	15	12	0
Sachet water taste	18	0	0	23	4	0
Sachet water colour	18	0	0	27	-	0
Packaging material Transparency	16	2	0	13	14	0
Sachet water odour	18	0	0	20	7	0

Source: Authors' Construct

Table 4.3.1. Consumer Awareness of Sachet Water Safety Requirements

Question	Frequencies and percentages							
	SD	%	D	%	A	%	SA	%
There are known channels for consumer complaints	49	28.5	91	52.9	25	14.5	5	2.9
I do not buy water from uncertified producers	70	40.7	89	51.7	9	5.2	2	1.2
My right to information on the safety of sachet water is addressed	80	46.5	79	45.9	9	5.2	1	0.6
Some producers of sachet water violate regulations on consumer safety	6	3.5	36	20.9	95	55.2	33	19.2
I do not buy some brands of sachet water because of poor quality	21	12.2	14	8.1	67	39.0	68	39.5
The staff of FDB educate consumers about uncertified sachet water in the market	95	55.2	47	27.3	18	10.5	10	5.8
The staff of GSB educate consumers to beware of uncertified sachet water in the market	92	53.5	50	29.1	16	9.3	12	7.0
There are uncertified sachet water producers in the metropolis	10	5.8	19	11.0	43	25.0	98	57.0
I know the regulators of sachet water in the metropolis	64	37.2	75	43.6	26	15.1	5	2.9
I have had education on what to look for before buying sachet water	85	50.0	66	38.4	13	7.6	5	2.9
I know the agencies to complain to when I have doubts about the quality of sachet water	95	55.2	51	29.7	20	11.6	4	2.3
I know sachet water farms that produce poor quality sachet water	66	38.4	61	35.5	27	15.7	16	9.3
I have reported to producers of sachet water on the poor quality of their products	76	44.2	60	34.9	26	15.1	8	4.7

Source: Authors' Construct Note: SD= Strongly Disagreed; D= Disagreed; A= Agreed; SA= Strongly Agreed

producer, the batch number makes it possible to re-call any defective products from the market. Both regulators and producers equally accepted the importance of indicating the name of product and address as well. The provision of product name and address was confirmed by Nuako *et al*. (2007) that all the sachets contained names of the products and addresses. Both the regulators and producers converged in opinion on the importance of providing the standard mark on the sachet water pack. The standard mark provides information on the certification status of any product duly approved by the Ghana Standards Board. The certification status helps determine water quality (Famiye-Addo 2011). It is worth pointing out that many producers of sachet water in the Tamale Metropolis do not provide the standard mark on their products as required. This can largely be attributed to the fact that many of the sachet water providers operate illegally. The regulators subscribed to the importance of the sensory characteristics such as the colour, odour, taste and clearness of sachet water. The producers of sachet water expressed similar opinion on the aforementioned characteristics. The standard provisions on sachet water quality expect the product to be colourless, odourless and tasteless (Famiye-Addo 2011). Similarly, both regulators and producers of sachet water converged in opinion on the importance of using transparent material in bagging sachet water. The use of transparent material in bagging sachet water makes it possible for consumers of sachet water to see any suspended matter in the water. The overwhelming endorsement of the importance of these parameters for determining the quality of sachet water by the sachet water producers in particular comes as a good piece of news to the regulators whose mandate it is to enforce the regulations.

Consumer Awareness of Safety Requirements of Sachet Water

The tools used to compute relevant data to answer the research question were frequencies and percentages. Table 4.3.1 presents the data required to answer the research question on consumer awareness of safety requirements of sachet water in the Tamale Metropolis. Note: SD= Strongly Disagreed; D= Disagreed; A= Agreed; SA= Strongly Agreed It can be seen from Table 4.3.1 that, the majority (140) of the respondents representing 81.4% either 'strongly disagreed' or 'disagreed' that there are known channels for consumer complains on the poor quality of sachet water. This response raises a lot of concerns in the face of the fact that 129 of the respondents constituting 76% consumers, cumulatively had tertiary, secondary and basic education, yet 81.4% strangely report having no knowledge about the channels for consumer complaints. It is however discernible in the face of the fact that, complaints about packaged water are to be made to the marketing department of the Ghana Standards Authority in Accra (Famiyeh-Addo 2011). This arrangement makes it difficult if not impossible for those affected in the districts and regions to make their complaints known. The GSB in the regional capitals lack the full complement of staff. The case in the northern region buttresses the claim where there is only one technical staff in the office of the GSB. About 92% (159) of the respondents cumulatively either 'strongly disagreed' or 'disagreed' with the statement that they do not buy sachet water from uncertified producers. This by implication means that consumers of sachet water patronize any available sachet water on sight without paying regard to whether the product is coming from a certified source or not. It is in the light of this that Addo *et al*. (2009) highlighted the need for consumer education to patronize products from manufacturers of sachet water who have obtained certification and license to produce.

The ignorance of consumers of sachet water may have accounted for the survival of uncertified sachet water firms whose activities endanger the health of consumers. Similarly, 159 of the respondents amounting to 93.5% either strongly disagreed or disagreed to the statement that, their right to information on the safety of sachet water is addressed. This situation constitutes an outright violation of the right of consumers to information as captured in the United Nations Guidelines on Consumer Protection (2003). The response to the question on whether "some producers of sachet water in the Tamale metropolis violate regulations on consumer safety" was quite startling. 128 of the respondents comprising of 74.4% either 'agreed' or 'strongly agreed' to the statement that some producers of sachet water in the metropolis violate regulations on consumer safety. At the flip side however, only 42 amounting to 26% of the respondents 'disagreed' to the statement. It is common knowledge that many illegal producers of sachet water in the metropolis go about their operations with impunity. The ostensible violation of regulations on consumer safety accounted for the reported destruction and further closure of some premises in parts of the country. The closure and destruction of unwholesome sachet water by officials of the FDB in the Greater Accra and Volta regions as alluded to by Adofo (2011) and Afrifa (2008) attest to the situation on the ground. In particular, were the closure of the 48 producers of sachet water in Accra (Adofo, 2011) and the shut-down of the premises of Kristar Filtered Water in Ho (Afrifa, 2008). In both cases, management of such firms had stern warnings to take steps to secure the necessary certifications and potential recalcitrant producers were duly cautioned to halt their activities or face similar actions.

Yet, another interesting revelation from the respondents was on the question as to whether they do not buy some brands of sachet water because they do not trust the producers. 135 of the respondents constituting 79% either strongly disagreed or disagreed to the statement. This by implication means that they do not discriminate in the choice of sachet water. In a dramatic twist to the position by respondents indicated above, the respondents overwhelmingly endorsed having knowledge about existence of uncertified sachet water producers in the metropolis. In response to the question on whether "there are uncertified producers of sachet water in the metropolis", 142 of the respondents forming 87% either 'strongly agreed' or 'agreed' to the statement. The awareness of consumers about the existence of uncertified sachet water producers is supported by the findings of a study carried out in Ghana by Lindsay (2005). The survey found that, only 300 sachet water firms had authorization to operate while 600 firms were operating illegally. Armed with the knowledge about the existence of uncertified sachet water producers, consumers ought to have been careful about the water they patronized. A cursory look at Table 4.3.1 reveals that, sachet water consumers do not perceive the FDB and the GSB to have done enough in educating the public. Coincidentally, both tallied with 84%

consisting of 142 of the respondents either 'strongly disagreed' or 'disagreed' in respect of the roles of the FDB and the GSB in educating consumers on the existence of uncertified sachet water. It can be deduced from Table 4.3.1 that 86% making up of 146 of the respondents cumulatively 'disagreed' to the question that they know the agencies to complain to when they had doubts about the quality of sachet water in the market. This claim confirms the perception in the preceding paragraph that the FDB and GSB failed to engage the public on the roles they perform through education with respect to sachet water safety concerns. A total of 127 of the respondents constituting 75% either 'strongly disagreed' or 'disagreed' that they know sachet water firms that produce poor quality water. The uninformed position of the respondents is at variance with the research findings by Okioga (2007) whose study found that about 47% of the sachet water tested in the Tamale Metropolis was contaminated by microbial bacteria. The perception of the respondents also runs contrary to the findings by Addo *et al.* (2009). They tested 30 samples of sachet water from ten different brands and astonishingly found about 37% of the water to be unwholesome for human consumption. This revelation supports the claim by IFC, (undated) that a major challenge facing consumers of water is the issue of awareness about water quality and the risk of contracting diseases from drinking untreated water. A glean at Table 4.3.1 reveals that 155 consisting of 91% of the respondents had never made any report to the regulators of sachet water for poor quality products in the market. This finding concurs with a report made by Folley (2012) in which he bemoaned the unwillingness of the public to provide adequate information on poor products quality and non-compliance to regulations. It is worthy of note that consumers do not only fail to report complaints to regulators but to the producers as well. The Table shows that, 155 amounting to 91% of the respondents do not report to the producers of sachet water about the poor quality of their product. It can be inferred from the ensuing discussion that the producers do not care a hoot about dangers consumers are exposed to for buying the sub-standard sachet water they produce. For the producers, it is business as usual provided they continue to get market for their products. The consumers are bereft of information that is required to help them make informed choices that will enhance their health and general well-being.

Conclusion

Summary of Findings

It emerged from the study that sachet water manufacturing firms who operates without authorization by the regulatory authorities constitutes a violation of the guidelines that seeks to protect the rights of consumers. It further points out that a sachet water firm is only given authorization after the satisfaction of stipulated standards and requirements that are geared towards protecting the interest of consumers. In other to ensure strict compliance with the code of practice in the production of sachet water, the regulatory bodies use several measures to regulate the operations of sachet water firms. These measures include; certification, fines, court sanctions, seizure and destruction of unwholesome sachet water and constant monitoring and testing of sachet water in the market to ensure compliance. The findings revealed that both regulators and producers of sachet water in the Tamale Metropolis subscribed to the importance of the parameters used in determining the quality of sachet water. The parameters will make it possible for consumers to tell the shelf-life and safety of the sachet water. This finding particularly from the regulators is no surprise because they formulate the laws on sachet water production. It is however intriguing that, the producers subscribed to the importance of the parameters for determining good sachet water yet, many violate this basic requirement of law. Some of the parameters such as the batch numbers and dates of manufacture, the study noted, are non-available in most of the sachet water sold in the metropolis. It is manifested from the study that, consumers of sachet water in the Tamale Metropolis are not sufficiently educated on their rights to information on the safety of sachet water sold in the metropolis. Within the purview of these knowledge vacuum, consumers of sachet water patronised any available sachet water on sight without paying regard to whether the product is coming from a certified source or not. This attitude of sachet water consumers has largely accounted for the existence and survival of the many unlicensed producers in the metropolis whose activities endanger the health of consumers. It also became apparent from the findings that sachet water consumers are aware of the existence of uncertified producers who violates regulations on consumer safety but are not aware of any available channel for such complaints to be made. In the midst of the consumers' unawareness of complaint channels, the study revealed that both FDB and GSB have failed to engage sachet water consumers in education on their rights to safe and quality sachet water. Sachet water producers are more concern in profit maximization and will producer sachet water once there is a ready market for their products whether their practices have been approved or not. On the other hand, consumers of sachet water are not fully aware of the possibility of contaminants in the sachet water they consume hence patronised any bagged water whether certified or not.

Recommendation

The regulatory institutions should educate the public to avoid sachet water which is uncertified using both the print and the electronic media. The features for determining the quality of sachet water should be part of the educational campaign to help inform the consuming public of what to look for before patronising sachet water. The educational campaign of activists should further encourage consumers of sachet water and registered firms to assist the regulatory institutions by reporting sachet water producers who flout the regulations to help protect the public and the sachet water business. In the light of these, the surveillance units of the FDB and the GSB should be well resourced with hot-lines to enable consumers to contact them with concerns of poor quality of sachet water in the metropolis. Recalcitrant producers should be given heavy penalties to serve as deterrent to potential culprits.

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APPENDIX 'A'TEST OF RELIABILITY

Reliabilty Test for Regulators

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	8	66.7
	Excluded[a]	4	33.3
	Total	12	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.683	21

Reliability Test for Sachet Water Consumers

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	16	100.0
	Excluded[a]	0	.0
	Total	16	100.0

a.Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.858	16

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
32.5000	80.667	8.98146	16

Reliability Test for Sachet Water Producers

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	18	100.0
	Excluded[a]	0	.0
	Total	18	100.0

a.Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.563	22

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