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Awareness and Perception of Media Campaign on E-waste effects among Residents of Ado Odo-Ota, Nigeria

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Abstract: Scholars' concern about environmental pollution and the attendant diverse health disorders have grown lately in Nigeria owing to the problem of electronic wastes. The challenge is compounded by citizens' insensitivity to the damage these wastes can unleash on lives. This paper investigates respondents' rate of awareness and knowledge, through the media, of e-wastes and how that rate affects attitude to the problem. Findings show that exposure to the media on the e-waste hazards was critically low. The broadcast media and the internet were identified as significant sources of information but residents were less frequently exposed to e-waste issues in the news. The awareness of health and environmental effects of e-wastes among the residents was also extremely low even as the menace was not perceived as a serious problem. The outgrowth of this was an unimpressive attitude toward resolving the problem. In addition to the traditional media and their online versions, it is recommended that interpersonal communication channels should be utilized to educate and persuade the citizens to adopt globally accepted standards for managing e-wastes.

Keywords: e-waste, public health, environmental pollution, media campaign, perception

Introduction

Surge in information technology and the proliferation of devices have increased the generation of electronic wastes (Christian, 2012). Public concern on the issue, especially among environmentalists, has remained visible as many waste materials are toxic and not biodegradable. These wastes contain lead, mercury, arsenic, phosphorus, cadmium and selenium, just to mention a few (Widmera, Oswald-Krapf, Sinha-Khetriwal, Schnellmannc & Boni, 2005). The lethal substances that e-wastes produce could lead to health disorders, including kidney damage, liver damage, respiratory failures, damage to the brain and nervous systems (Osibanjo & Nnorom, 2007; Adeola, 2012; Iyatse, 2016). Research has also linked the rate of toxic compounds in e-waste to cancer, foetus developmental defects and other health problems from samples of breast milk, placenta and hair (Needhidasan, Samuel & Chidambaram, 2014). Improper disposal of e-wastes burning constitutes an immeasurable danger to the ecosystem as these actions could lead to diverse environmental problems such as groundwater contamination, atmospheric pollution and soil leaching (Terad, 2012).

Some 20 to 50 million metric tons of e-wastes are generated annually, which is five percent of all municipal solid wastes worldwide - almost the same volume as plastic packaging, "but it is much more hazardous" (Greenpeace International, 2016). Furthermore, StEP initiative has predicted 33% increase in the global e-waste generation by 2017 (Lewis 2013). Regrettably, Nigeria has been ranked among the highest generator of e-wastes with "about 1.1 million tons of e-waste generated annually, far more than the combined volume generated by most other countries in the ECOWAS region" (Basel Monthly Waste News, 2014; Obaje 2013).

Nnorom (2009) speculates that the lack of awareness of the e-waste hazards and danger associated with improper disposal techniques are the major hindrances toward eliminating the e-waste problem. Similarly, Sivathanu (2016) warns that awareness of the toxic effects on human health, awareness of environmental hazards, awareness of proper disposal of e-waste, awareness of e-waste management by stakeholders and awareness of convenience of recycling were the five significant factors that influence consumer's preference toward proper e-waste disposal and

management. Ignorance about the dangers of e-waste to human health is no doubt a fundamental factor militating against its proper disposal and management. Thus, adequate awareness of the health and environmental effects of e-waste can stimulate individual perception of the problem and the eventual reaction to the issue.

In the bid to create public consciousness about e-wastes, the mass media both local and international have carried out diverse news reports that have been investigated by scholars. However, systematic investigation on the extent of public exposure to media content on e-waste effects as well as the awareness/knowledge of health and environmental implications of stacking e-waste in homes, offices and business premises, and indecorous disposal practices in Nigeria have not been ascertained. This drawback informed this study.

Objectives of the Study

To bridge this gap in the e-waste literature, this study sought to accomplish the following objectives;

1. To discover the residents' knowledge/awareness of e-waste effects.
2. To ascertain the media through which the residents of Ado-Ota obtain information on the health and environmental effects of e-waste.
3. To determine the extent to which the residents of Ado-Ota are exposed to media campaigns on e-waste effects.
4. To find out the residents' perception of the e-waste effects on public health and the environment.
5. To determine the extent to which awareness of the health and environmental risks associated with e-waste influence residents' current behavior toward e-wastes.

E-Waste's Health and Environmental Effects

E-waste as defined by Puckett, Byster, Westervelt, Gutierrez, Davis, Hussain, and Dutta (2002, p. 5) is waste from a broad and growing range of electronic devices "from large household devices such as refrigerators, air conditioners, cell phones, personal stereos, and consumer electronics to computers which have been discarded by their users." E-waste has been categorized into three namely; the large household Appliances (refrigerator, air conditioner, washing machine, etc), ICT appliances (computer and accessories, cell phones, etc), and consumer equipment consisting of television, DVD players, mp3 players, video cameras and others (Violet, 2008).

E-waste has become a serious social problem; an environmental and health threat to many nations of the

world, especially the developing countries as they constantly depend on imported used-electronics which are cheaper than brand new ones (Puckett and Fogel, 2005). Little wonder, Olukoya (2008) once asked rhetorically: "if the western countries with their technological sophistication and organized waste management still encounter challenges of controlling the e-waste stream, what then would be the fate of developing countries like Nigeria?"

Toxic elements in e-waste could have adverse effects on human health and the environment if not handled properly. Studies have established that direct contact with harmful e-waste components such as lead, cadmium, chromium, and mercury causes damage to the central and peripheral nervous systems, genitourinary system and DNA. It also causes seizures, retardation, high blood pressure, inflammation and oxidative stress. Repeated exposures to e-waste toxic elements could cause severe damages to the kidney, liver, and lungs. Furthermore, irregular heartbeats, cancer and damage to fetuses are traceable to these toxic wastes. (Violet, 2008, Needhidasan, et al., 2014; Recycling for Charities, nd)

E-wastes do not only endanger the human health. They are also environmental hazards. Atmospheric pollution, disruption in the supply of groundwater, degradation of soil nutrients and environment-to-food-chain contamination are conditions that have been linked to the unsafe handling of e-wastes (Lundgren, 2012). Informal recycling practices by scavengers also magnify the health and environmental risks as the toxic chemicals are emitted into the atmosphere in the process.

Research has also shown that residents of major recycling cities around the world exhibit various health conditions caused by the toxic components of the e-waste stream (Grant, Goldizen, Sly, Brune, Neira, Van den Berg & Norman, 2013; Awasthi, Zeng & Li, 2016). To reduce the environmental effects of e-wastes, Needhidasan, et al, (2014) recommended that adequate infrastructure for e-waste collection and recycling could reduce greenhouse gas emissions. A medical expert (Iyatse, 2016) argues that the challenges associated with e-wastes are not different from those of radiation, which could emanate from other sources other than e-wastes, adding that reduction of all forms of human exposure to radiation should be the utmost concern.

Theoretical Framework

This paper is anchored on the perception theory. While awareness is the capability to be familiar with or be cognizant of an issue or a state

of consciousness, perception refers to the process of individual's reception, selection, organization and interpretation of information to deduce meaning. The outcome of this individualistic sensory evaluation is manifested in diverse interpretations given to the same message, depending on personality variables such as personal beliefs, past experiences, social relations, cultural expectations and psychological dispositions.

The selective process is, therefore, at the core of the perception theory. Individuals, as a matter of preference, selectively go for the medium and content that offer them gratification. They selectively pay attention to certain issues that reinforce their existing beliefs or attitudes while excluding others.

Individuals are exposed to a myriad of media messages and interpersonal communication but they tend to perceive or decode these messages in accordance with their past experiences, current disposition, and needs (Okenwa, 2002). The e-waste menace is one of such messages. Public awareness of the health and environmental effects of e-waste, therefore, depends on how exposed the individual is to the media contents on the issue. The individual needs to pay attention in order to gain adequate knowledge in this regard but attention may not be visible if the message is not relevant to the individual's predispositions.

Perception of an issue affects the judgment and reactions of an individual toward it (Idiegbeyan-ose, Nkiko & Osinulu, 2016). The implication is that public knowledge of and reactions to e-wastes could influence its control. Education influences perception. Babu, Parande & Basha (2007) note that one of the most effective ways of dealing with the e-wastes stream is to educate citizens.

Method and Materials

The study adopted the survey approach. The study population consisted of adults residents in Ado-Odo-Ota Local Government Area, the commercial hub of Ogun State of Nigeria. The population of the study area stands at 527,242 with a projection of 621,830 by 2011, estimated at 3.36% per annum according to the National Population Commission Census figures (2006). The local government also has a total of 133,398 households as at 2006. It has a dynamic integration of commercial, industrial and rural locale occupied by residents who are predominantly Nigerians. The area is well known for manufacturing, public and private business ventures, open markets, business complexes, commercial banks, healthcare facilities, secondary and tertiary institutions as well as training institutes. The implication of this is

generation of high quantity of e-waste.

The study adopted the multistage sampling procedures. The local government consists of 16 communities which were grouped into rural, commercial and industrial areas to give a true representation of the population. Sango-Ota, Agbara, and Atan were purposively selected to represent the commercial, industrial and the rural segments respectively. Their visibility attested to their selection. A total of 300 respondents each were purposively chosen from the selected areas totaling 900 respondents that participated in the study. The eligibility of respondents was based on age (18 years and above), ownership of household electronics and the willingness to respond to the instrument. All the 900 copies of the questionnaire administered were properly filled and found useable, yielding 100% response as a result of the stay and collect approach adopted in the administration of the instrument. By this approach, research assistants always waited to ensure that each respondent return the questionnaire after completing it.

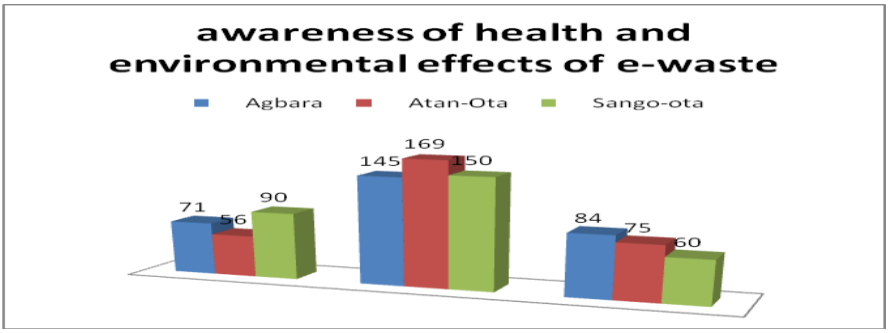
Results

A. Are Residents' Of Ado-Odo-Ota Aware of E-Waste Effects?

Table 1: Awareness of health and environmental effects of e-waste

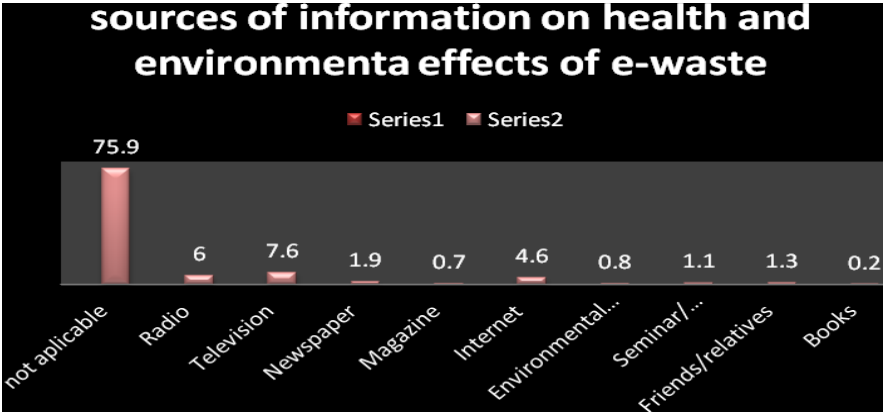
	Awareness of health and environmental effects of e-waste			**Total**
	Aware	*Not aware*	*Undecided*	
Agbara	71	145	84	300
Area Atan-Ota	56	169	75	300
Sango-ota	90	150	60	300
Total	217	464	219	N=900

Figure 1: Awareness of Health and Environmental effects of e-waste



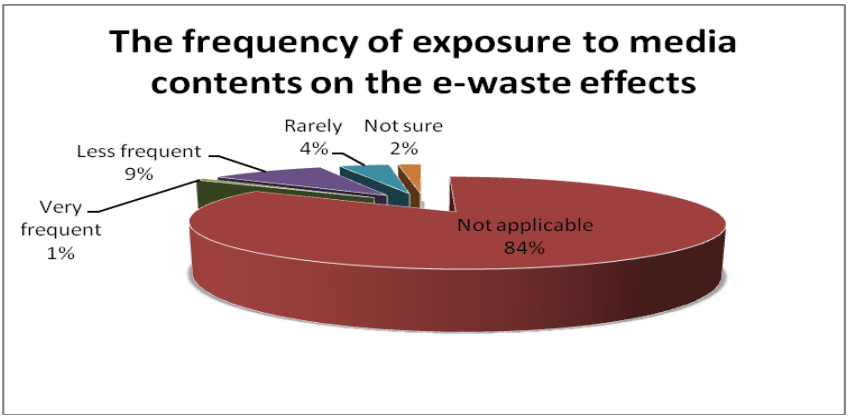
B. What is the medium/media through which the residents of Ado-Ota obtain information on the health and environmental effects of e-waste?

Figure 2: Sources of Information on health environmental effects of e-waste



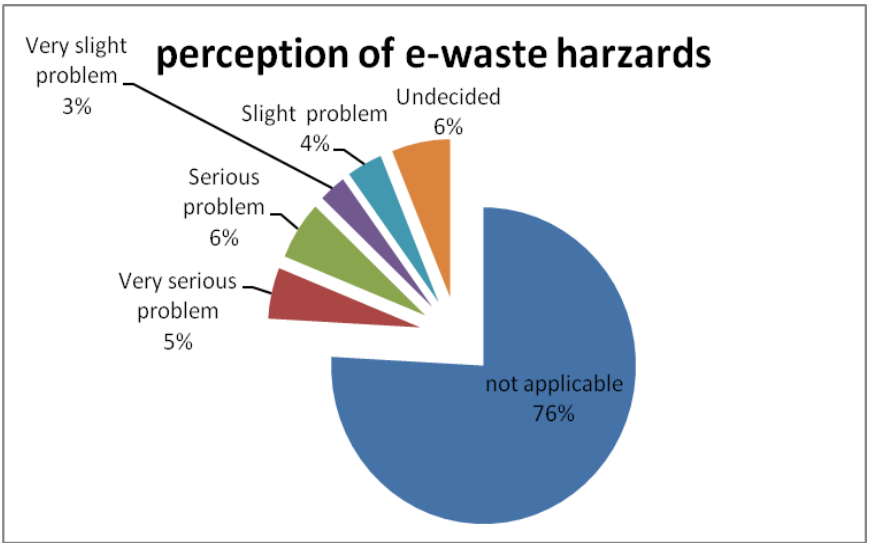
C. To what extent is the residents of Ado-Ota exposed to media campaigns on e-waste effects?

Figure 3: Frequency of exposure to media contents on e-waste effects



D. What is the residents' perception of the e-waste effects on public health and the environment?

Figure 4: Perception of e-waste hazards

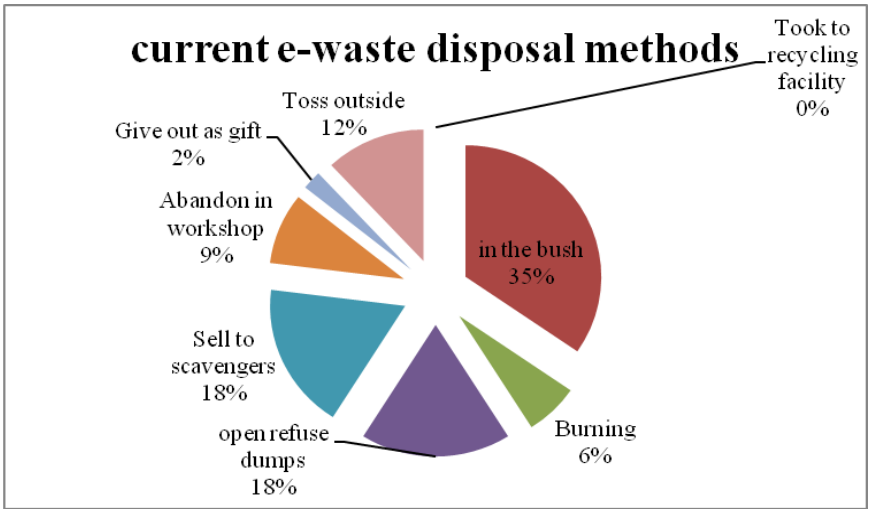


E. To what extent to which awareness of the health and environmental risks associated with e-waste influence residents' current behavior toward the e-waste stream?

Table 2: Awareness of health and environmental effects of e-waste

		Current possession of e-waste in homes, office or business premises		Total
		Yes	*No*	
Awareness of health and environmental effects of e-waste	*Aware*	150	67	217
	Not aware	332	132	464
	Undecided	147	72	219
Total		629	271	N=900

Figure 5: Current e-waste disposal methods



Discussion of Findings

The results of this study show that public awareness on health and environmental implications of e-waste was critically low. This outcome is in line with studies on awareness of e-waste effects carried out in the southeast of Nigeria (Okoye & Odoh, 2014; Ubachukwu, Phil-Eze & Emeribe, 2014). This implies that the health of Nigerians and the environment could be

adversely affected by the e-waste hazards since the majority of the citizens were not even aware of the risks associated with it.

The findings also show that the broadcast media and the internet were significant sources of information on the e-waste menace. This finding also supports previous studies on the significance of the broadcast media in publicizing health and environmental issues (Ugboma, 2002; McCarthy & Brennan, 2009 cited in Babalola, Babalola & Okhale, 2010). The role of the broadcast media in this aspect emanates from its coverage of a wide geographical area and has got nothing to do with better performance in terms of professionalism, ethics – global or self – (Omojola, 2008; 2014) sophistication and so forth. This outcome reaffirms the tenets of selective exposure and attention spelt out in the perception theory. Residents selectively exposed themselves and paid attention to these platforms and contents from which they obtained the information about the dangers of e-wastes to human health and the ecosystem. Therefore, these platforms could be widely utilised in sensitising the residents about the risks associated with stockpiling e-wastes in homes, offices and business premises.

According to Figure 3, respondents were not often exposed to media contents on e-waste. The salience conferred on an issue could transpose it into an item on the public agenda and elicit the subsequent actions taken by the public on it (as supported by earlier citations). The mass media focus on the e-waste menace, which was missing as results of this study have shown, could expand the audiences' scope of knowledge and the perception of e-waste implications. Development messages that demonstrate the severity of health as well as environmental implications and the benefits of taking desired actions, sustained for a long time, could enhance knowledge and risk perception, and induce expected actions. Unimpressively, however, respondents did not have access to such messages.

Another significant finding of this study is that many residents did not perceive the e-waste issue as a life-threatening health and environmental problem. The implication of this finding is the continued indulgence in unhealthy the e-waste practices which triggers more harm to human health and the environment than before. This finding reinforces the study which concluded that "there is a gap between the extent to which people are aware of the environmental conditions and the pro-environmental behaviors they display" (Kollmuss & Agyeman,

2002; Wood, Tam, & Guerrero-Witt, 2005 cited in Pelletier & Sharp, 2008, p. 210). It also supports Ideho's (2012) statement that the evidence of health hazards associated with e-wastes did not discourage the stakeholders in informal recycling to stop the trade. Though economic gain was cited as their motivating factor.

The finding also confirms the observations made earlier about the large volume of obsolete electronics temporarily stored for later disposal as "consumers now rarely take broken electronics to a repair shop as replacement is now often easier and cheaper than repair" (Puckett et al, 2002; Puckett & Fogel, 2005). The continuous acquisition of more and more ICT gadgets and electronic appliances for status symbol has become a tradition that exacerbates the stockpile of obsolete electronic and electrical items in homes and offices. Lack of awareness about e-waste recycling and other globally advocated methods of e-waste control as well as non-availability of e-waste recycling facilities within the community could be contributing factors for the continuous indulgence in uncultured e-waste activities.

Conclusion and Recommended

This study has established that public awareness of the health and environmental effects of e-waste among residents of Ado-Odo-Ota was extremely low. The broadcast media and the internet were identified as significant sources of information about the e-waste problem. However, the frequency of the residents' access to media contents on e-waste was critically low, implying that the mass media have not been effectively utilized to build public agenda concerning the dangers of stockpiling e-wastes in homes and offices. The few amongst the residents who are exposed to media campaigns did not perceive e-wastes as a critical problem affecting the community. Hence, they were not influenced to change their existing behaviors toward the problem. Therefore, the following are recommended:

1. Public awareness and education on e-waste control through the mass media should be intensified so as to sensitize the public on the importance of adopting globally accepted standards for eliminating the e-waste menace.
2. Interpersonal communication channels such as opinion leaders, environmentalists, health officials, religious institutions, group meetings, provincial administrators and development agencies should be utilized to stimulate public consciousness and participation for effective e-waste control.

3. Interactive approaches such as phone-in programs and social debate initiatives should be fused into the broadcast media time slot where environmental issues such as the e-waste menace are discussed. This would enable people to contribute or clarify issues that may affect their perception and reactions to the problem.
4. One of the ways government and other stakeholders can increase awareness is by making use of billboards and digital street signs (Morah & Omojola, 2013) located in strategic points to create awareness on the e-waste menace.
5. The Ogun State Environmental Protection Agency (OGEPA) should develop and implement effective e-waste management facilities in partnership with development agencies, NGOs (Odiboh et al., 2017) and other interested bodies while educating the residents on the need to patronize the facilities to rid the environment of hazardous substances from e-wastes.

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