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Personal Variables and Attitude of Teachers Towards Solid Waste Mangement in Calabar Education Zone in Cross River State, Nigeria.

Unoh, Eno Etim
Email: enoetimunoh@gmail.com

Inyang-Abia, M.E.
Email: mosseydemmy@gmail.com
&
Ajom, Leo Bassey
leoajom3333@gmail.com

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Department of Environmental Education
University of Calabar, Calabar

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Correspondence Email:
enoetimunoh@gmail.com

Abstract

This study was designed to establish the influence of personal variables on attitude of teachers towards solid waste management in Calabar Education Zone of Cross River Sate, Nigeria. To achieve this, two null hypotheses were posed and tested at 0.05 level of significance. Ex-post facto research design was adopted. The population consisted of all the teachers in all the public secondary schools in Calabar Education Zone of Cross River State. The simple random and proportional simple random sampling techniques were used to select four LGAs, 19 public secondary schools and 397 teachers in the area of study. 'Attitude Towards Solid Waste Management Questionnaire' (ATSWMQ) was used. It was divided into Part A (Teachers' personal variables) and Part B (Attitude towards solid waste management) with 24 items. The instrument first validated by three experts from Environmental Education and Educational Measurement and Evaluation Departments of the University of Calabar was also field tested. The Cronbach Alpha Reliability Test on part B showed a coefficient estimate of 0.82 indicating a very high reliability index. Obtained field data were analyzed using independent t-test and One-Way Analysis of Variance (ANOVA). The results **(t= -3.528; þ= 0.000); F=11.926;**

	þ=0.000) revealed, significant gender difference and that educational level significantly influenced their attitude towards solid waste management. Based on the result it was recommended, among others that, students of Environmental Education as prospective teachers should build positive attitude towards solid waste management.

Introduction

The rate at which indiscriminate disposal of solid waste has posed severe environmental and health risks on human population is quite disturbing. Perhaps that is one reason Abimbola (2012) opines that from Engineering to Behaviourial Sciences, solid waste management has become a germane issue among governments, researchers, private organizations, environmentalists and the general public according to. The rapid urbanization experienced the world over and particularly in Nigeria has led to a plethora of environmental challenges including poor solid waste management within the different parts of the society. The problem of indiscriminate disposal of solid waste, urban sprawling, decaying inner city, inadequate housing, crime and congestion, among others are quite alarming in recent time.

Indeed, teachers' attitude in association with various business activities such as selling of sachet water, biscuits, can drink, sweets, moi-moi, sugar cane, groundnut and other fruits in and outside the school compound may contribute to indiscriminate solid waste disposal. Poor waste management has become a common phenomenon in most Nigerian urban areas in the recent time. Inhabitants in the study area (teachers included) have showed no difference in managing their waste. They tend to dump refuse anywhere in the environment as if it has no implication on their community health and social welfare. It is also capable of inflicting permanent damage on the ecological system. Considering the magnitude of waste released daily into the environment and, considering the fact that there appears to be no serious effort for the efficient management of these wastes, in spite of their environmental effects on human health, there is need for people to understand the dynamics that are essential for the explanation of the trends and emerging disease epidemics on the human environment associated with poor management of solid waste. This will help to affect human behaviour towards the environment (Ahmed, 2011).

Increased urbanization, inadequate environmental sanitation exercises, low environmental awareness, among others have forced residents to dump solid wastes carelessly or haphazardly anywhere they deem fit. Such controversial tendencies and attributes is unacceptable if we desire to live in beautiful and serene environment. Some of the lagoons and water fronts in the country have been turned into dumps for all sorts of solid waste without thinking of the health and environmental implications. Trucks fully loaded with faeces are sometimes seen queuing up in large numbers to discharge the contents into the lagoon (Etefia, 2012).

To ensure a clean and safe environment, the Cross River State Government established Calabar Urban Development Authority (CUDA, 2010) to monitor the environmental quality and to ensure a refuse free environment. However, despite the government efforts at making the environment clean in Calabar Education Zone in Cross River State, Nigeria teachers still display the "I don't care attitude about their environment." Despite the provision of refuse receptacles by the government, many residents still prefer dumping refuse at places which they consider convenient to them without thinking of the health implications of their action on the environment and human beings. Indiscriminate solid waste disposal affects the quality of water, and air, blockage of drainage, and causes serious environmental hazard which the people seem not to be bothered about.

One of the greatest problems facing Nigeria (Akpe, 2016) in recent time is the problem of indiscriminate solid waste disposal and poor solid waste management. In Cross River State particularly in the urban centres like Calabar, Ikom, Ogoja and Ugep, to mention but a few it is becoming unbearable. It is no longer news that the study area which used to be the best in Nigeria in terms of cleanness and neatness has lost that respect and glory which might be due to peoples' attitude towards solid waste management.

The indiscriminate solid waste disposal does not only constitute an eye-sore, but has posed a serious threat to the health of the people, and of course, threaten the aesthetic nature of the environment (Etefia, 2016). Udowong (2013) reported an increase of 17056 tonnes of solid waste each generated in major cities in Calabar Education Zone of Cross River State. The researcher assumed that, the increase in waste generation within Calabar and its environs require adequate mechanisms like waste bins, and disposal trucks to facilitate collection and adequate disposal and management. Unfortunately, the inability of the municipal authority to provide adequate number of waste bins and trucks needed has resulted to indiscriminate disposal of solid waste into gutters, nearby bushes, road side, streams and anywhere one feels like. The poor attitude to management of solid waste has led to unanticipated health consequences on human and the environment.

Solid waste generation, disposal and management are increasingly becoming alarming, worrisome and important issues all over the world. Solid waste generation and management among the educated and uneducated people continue to increase at an alarming rate worldwide (Khan, Faisal, & Farooqi, 2011). One of the most controversial planning issues worldwide is the localization of waste disposal and management infrastructure at the local communities where people living within the catchment areas suffer direct effect from the waste management plant (Pol, Di Masso, Castroechini, Bonet, & Vidal, 2006).

Reports in media show that thousands of lives are lost every year to environmental related diseases such as cholera, diarrhea, malaria, typhoid, and river blindness. Majority of people live in filthy environments infested by cockroaches, rats and mosquitoes as a result of indiscriminate dumping

of refuse. The air, which is an indispensable source of life, has been polluted with chemicals, pathogen or offensive odour due to indiscriminate disposal of waste (Bluman, 2004).

It is a known fact that human health is contingent among other things, on the quality of air that one breathes, the food that one eats, the water that one drinks and the environment in which one lives. Successive governments at the federal, state and local levels had demonstrated their concern for human health and the environment through enactment of laws and promulgation of decrees that compel people to be clean and respect the environment. In 1984 for instance, there was an introduction of monthly national environmental sanitation exercise to ensure a clean and healthy environment. At that time, people were compelled to clean their environment at least once in a month. The exercise became part of the life style of Nigerians as it was routinely observed. This was a deliberate attempt by the government to promote human friendly attitude towards the environment and the health of the people. Unfortunately, this government effort was never appreciated by the people as they pay less attention to this programme, hence the cancellation.

There are reports that wastes that are not properly disposed can cause water pollution, which may breed diseases like cholera, and typhoid (Bartone, 2000; Buckle & Smith, 2000). All these are pointers to the fact that, a proper understanding of disposal and management of solid waste becomes imperative for study in Calabar Education Zone of Cross River State, because indiscriminate disposal of solid wastes is a threat to the environment and human health. Okebukola (2011) and Inyang-Abia (2015) emphasize that indiscriminate disposal of solid waste is a major factor in the spread of gastrointestinal and parasitic disease primarily caused by vectors. The author further asserted that diarrhea, cholera and typhoid fever are among the major killer diseases due to improper disposal of solid waste.

Environmental experts are of the view that the implications of this practice are very grave. The failure of relevant agencies to stem the tide of reckless waste dumping and littering of Nigerian cities have resulted in indiscriminate waste disposal along major and minor streets, roads and surrounding bushes are all indication to the fact that there is a clear pattern of non-enforcement or non-implementation of existing environmental sanitation laws. Regrettably, the above condition, that is, indiscriminate disposal of solid waste enhances environmental hazard in any society. It is important to note that endangered public health situation can exert excessive pressure on the environment and public health.

Irregular and unplanned dumping of solid wastes, especially at night, which is often in gross violation of relevant rules and regulations continue to hinder plans, preparations and effective land use delineation which were expected to usher in a beautiful, clean and orderly environment. Consequently, there remains a huge gap between policy formulation, execution and implementation which increase the problem of solid waste management in the study area which necessitate the need to evaluate the problems of solid waste disposal and management in Nigeria.

Ethically, the beauty of any environment lies on its good sanitary condition. This is so because, when an environment is clean the lives of citizens are not threatened by illnesses and diseases

A number of factors may influence teachers' attitude towards solid waste management in the study area. Teachers' gender or gender may significantly influence their attitude towards solid waste management in various parts of the society. In most cases, women tend to treat the environment with tenderness and respect. This may be based on the fact that women are so close to the environment than their male counterparts. It is very common to find women sweep the environment, collect all dirt gathered into bin, and dispose them opportunity at a designated place where solid wastes are collected. This is different from most men who find it difficult to sweep, talkless of collecting and disposing such wastes gathered.

Teachers' educational level can also influence attitude towards solid waste management in the society. A teachers' educational qualification or level significantly influence has attitude towards solid waste management. This implies that the higher the teachers' educational level, the better their attitude towards solid waste management. For instance, an individual with first school leaving certificate would have a different perception about solid waste management than the person with senior secondary school certificate. Similarly, a teacher with first degree differs in attitude towards solid waste management than teachers with post graduate degree, master and doctor degree respectively.

Gender is a moderating variable in human perception and their attitude towards solid waste management. Literature reviewed showed that women are more close to the environment than their male counterpart, hence, the female gender have been linked with indiscriminate waste disposal in the environment. Both empirical and theoretical findings supported this view. A few empirical literature reviews argued that the male folk are more responsible for the abuse of the environment, especially indiscriminate dumping of waste and most times waste generation (Akpan, 2012).

Gender is a variable that has received consistent attention among environmental researchers. Some studies point out that females are more associated with the disposal of solid waste than males (Khan et al, 2011). For instance, in a study carried out to find out the level of waste management among male and female students, Ferrer (2015) discovered that both genders have almost the same level of waste disposal practice except in reuse practice where female students tend to reuse materials clothes, papers, etc. more often than male students. After considering the overall practice, they further concluded that though both gender fell on the same category, mean figure revealed that women (2.45 mean value).

Similarly, in the study of Tikka, Kuitunen and Tynys (2000) where major variation among students were found according to their gender, female students tend to show more responsibility toward the environment than male students based on their research. Yilmaz, Boone and Anderson (2004) also

identified the intensity of students' views with regards to environmental issues and revealed in their study that female students exhibited more support for environmental issues than male students different result were obtained by (Eisler, 2003) when they explored the gender differences on environmental beliefs, opinions, knowledge and behavior. Their findings showed that males have higher environmental knowledge. However, females were more aware of the environmental risk.

Education has been found to have a correlation with waste generation and management, disposal and recycling using relevant technology to reduce the effect on human and environmental health. Lepose and Mettler (2019) observed that most rural dwellers tend to lack prerequisite knowledge on the generation, collection, management and disposal of waste at home and within the environment they are located. One of the major reasons is the lack of environmental education and other relevant knowledge on solid waste management. Thus the longer period the individual spent in formal school system, the more likely he/she will be willing to be effectively in disposal of solid waste and more experience he/she will have.

Level of education also makes people put in extra effort in municipal solid waste management (MSWM) practices such as waste minimization (Khan 2011). The findings of Coertjens (2010) revealed that educational track is one of the important factors in explaining people's environmental attitudes and awareness. In a study carried out to find out the knowledge, attitudes and practices associated with waste disposal in Jos South metropolis in Plateau state, Nigeria. Jatau (2013) discovered that respondents with higher level of education such as B.Ed., HND, M.Ed., or Ph.D. possessed adequate level of knowledge of the impact of improper waste disposal on health than those with lower level of education like FSLC, SSCE, and NCE.

Samuel (2016) found out in his research that primary six school pupils possessed awareness of refuse and sewage disposal than the pupils in the lower classes. Most of the respondents in the higher primary school level according to the study of Samuel demonstrated higher level of awareness that pests and vectors can breed diseases when there is stagnant water in the environment, drainage blockage, inappropriate refuse disposals and lack of personal hygiene than those pupils at the lower class levels. Furthermore, the study revealed that most of the pupils in primary six knew the pests and vectors which affect health than the pupils in the lower classes.

According to Jatau (2013) in most cities, the mounds of decomposing rubbish provide breeding grounds for rats, flies, and mosquitoes, contributing to unhealthy environment. The poor waste disposal attitudes and practices may be adduced to poor knowledge of the impact of improper waste disposal on health. He submitted that sufficient awareness of the impact of waste disposal on health may help people to protect themselves from diarrhea, typhoid fever, cholera, hepatitis, malaria and other infections. Adequate awareness of the negative impact of poor refuse disposal may encourage people to adopt positive waste disposal practices may also promote personal hygiene and the health of the environs.

On the assessment of waste disposal practices among residents of Owerri, Adogu, Uwakwe, Egenti, Okwuoha and Nkwocha (2015) discovered that level of education is a strong determining factors. According to Peters (2017) and Inyang-Abia (2021) education is necessary in order to create awareness of the causes of problems such as food and water scarcities, pollution, and solid waste disposal/ management, among others. Lengard (2005) asserted that environmental education is very essential to all because it has potential effect of affecting peoples' negative attitude towards the environment. The author noted that through learning an individual is able to transform his environment, and actualize his own potential by a process.

To this end, education is the most important weapon of change. Any fundamental change in the intellectual and social outlook of any society has to be preceded by an educational revolution. With knowledge acquired through education an educated individual would feel guilty abusing the environment with careless stupendous solid waste disposal, whereas the illiterate would not be bothered. Anijah-Obi (2015) noted that a key element in human capital oriented strategy for community sound and sustainable solid waste management is education. She states in one of the goals derived from the philosophy that there should be the training of mind in the understanding of the world around.

On the basis of the above exposition, this study is therefore designed to empirically examine the influence, if any, of secondary teacher personal variables on attitude towards solid waste management with sharpened focus on their gender and educational level.

Methodology

The research design adopted for this study is the Ex-Post Facto. According to Isangedighi, Joshua, Asim and Ekuri (2004), this research design basically studies phenomena after they have occurred. It was considered most suitable for the study at hand.

As at the time of the study, available statistics from Cross River State Secondary Education Board revealed that 3014 teachers were in the 74 public secondary schools in Calabar Education Zone of Cross River State. The population of this study therefore consisted of all public secondary school teachers in the zone which is made up of seven Local Government Areas: Akamkpa, Akpabuyo, Bakassi, Biase, Calabar Municipality, Calabar South and Odukpani.

In selecting the local government areas, public secondary schools and teachers for the study, the proportional simple random sampling technique was adopted. This yielded a total of four Local Government Areas, 19 public secondary schools and 397 teachers. The instrument used for data collection in the study was questionnaire tagged: **Attitude of Teachers Towards Solid Waste Management Questionnaire** (ATSWMQ). It was divided into A and B. Part A requested for respondents' personal data which include gender and educational level. Part B measured attitude of teachers towards solid waste management with 24 items using the 4-point Likert-type scale of

Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). Only items in part B were subjected to reliability test using the Cronbach Alpha method. A random sample of 50 non-participant residents in two communities was used to confirm the reliability status of the instrument. Data from the field-test were subjected to Cronbach Alpha reliability estimate for the internal consistency of the questionnaire items. A reliability result of 0.82 was obtained, indicating that the instrument was highly reliable and suitable for the study.

Primary data were obtained directly from the 397 (122 Males and 275 Female) respondents ***in situ*** as the researcher and one assistant visited all the 19 secondary schools selected for the study to administer the instrument. In each selected secondary school, the researchers obtained permission from the school principal before administering the questionnaire. Of the 450 copies of the instrument administered during the two-week exercise, only 413 were retrieved, out of which 397 were correctly filled and therefore useful for the study which cut across 19 schools located in the four randomly selected LGAs (Akamkpa, Akpabuyo, Biase and Calabar Municipality).

Results

Ho 1: Significantly gender difference does not exist in the attitude of secondary school teachers towards solid waste management.

The resulting data were subjected to independent t-test analysis. Table 1 shows the results of the analysis.

Table 1: Independent t-test analysis of the influence of gender on teachers' attitude towards solid waste management in Calabar Education Zone of Cross River State (N = 397).

Gender	n	$\bar{x}$	SD	T	p-value
Male	160	58.44	6.46		
				-3.528*	.000
Female	237	60.75	6.32		

*Significant at the 0.05 level of significance

The information on Table 1 shows a significant difference of teachers' gender on their attitude towards solid waste management (t= - 3.528; þ= 0.000). The result shows a higher mean score and less variability in the attitude of the female secondary school teachers than their male counterparts towards solid waste management. Hence, the null hypothesis that significantly gender difference does not exist in the attitude of secondary school teachers towards solid waste management in Calabar Education Zone of Cross River State is rejected at the 0.05 level of significance.

Ho2: Educational level does not significantly influence attitude of teachers towards solid waste management.

Educational level was grouped into NCE, First degree, Masters' Degree, and Ph.D. One-way Analysis of Variance (ANOVA) was adopted to analyze the data derived from the instrument and categorized as relevant. The result is presented in Table 2.

Table 2: Summary data and one-way analysis of variance (ANOVA) of the influence of educational level on attitude towards solid waste management

Educational level	N	$\overline{x}$	SD		
NCE	214	58.14	6.70		
First degree/HND	114	61.25	6.07		
Master's degree	39	62.74	5.56		
Ph.D	30	62.50	3.27		
Total	397	59.82	6.47		
Source of variance	SS	df	MS	F	P-value
Between groups	1383.874	3	461.291	11.926*	.000
Within groups	15201.068	393	38.68		
Total	16584.942	396			

Significant at the 0.05 level

The information in Table 2 shows that level of education of teachers significantly influences their attitude towards solid waste management in Calabar Education Zone of Cross River State (F=11.926; þ=0.000). The null hypothesis that educational level does not significantly influence attitude of teachers towards solid waste management waste management in Southern Senatorial District of Cross River State is rejected at the 0.05 level of significance. To find out the direction of influence a Post Hoc Test using Fisher's Least Significant Difference (LSD) test was performed as reported in Table 3.

Table 3: Fisher's LSD test of the influence of teachers' educational level on attitude towards solid waste management

Level of education (I)	(J)	Mean difference (I-J)	Standard error	þ-value
NCE	First degree/HND	-3.1095	-7211*	.000
	Master's degree	-4.5987	1.0828*	.000
	Ph.D	-4.3551	1.2125*	.000
First degree/HND	Master's degree	-1.4892	1.1537	.198
	Ph.D	-1.2456	1.2762	.330
Master degree	Ph.D	.2436	1.5103	.872

* Significant at 0.05 level of significance

The information on Table 3 shows that the attitude towards solid waste management of teachers with NCE is significantly lower than that of teachers with first degree/HND; significantly lower than that of teachers with Master's Degree, as well as significantly lower than that of teachers with Ph.D. But teachers with first degree/HND do not significantly differ in their attitude towards solid waste management

Discussion

Teachers' gender and their attitude towards solid waste management

Hypothesis one which was stated in a null form was rejected. This implies that teachers' gender (male or female) significantly influences their attitude towards solid waste management in Calabar Education Zone of Cross River State, Nigeria. The females in the study area tend to have more positive attitude towards solid waste management than their male counterparts. This result is not coming as a surprise to the researcher but buttresses the view point of most scholars in the review of related literature who submitted that the attitude of female teachers towards solid waste management is significantly more positive than that of their male counterparts.

Though a few scholars perceived differently, yet it is unequivocally clear that females have a more significantly positive attitude towards solid waste management. This finding is in support of Ferrer (2015). He found out that although both genders have almost the same level of waste disposal practice but in reuse practice the females tended to reuse more materials, clothes and papers. According to him the male students, after considering the overall practice, fell within the same category, but his figures revealed that women scored a higher value than their male counterparts.

Teachers' educational level and their attitude towards solid waste management

Hypothesis 2 which was stated in a null form was also rejected while the alternate which state that teachers' educational level significantly influences attitude towards solid waste management was upheld. This implies that the higher a teachers' educational level, the better the attitude towards solid waste management in Calabar Education Zone of Cross River State, Nigeria. This result is not in doubt because none of the literature reviewed said otherwise.

The gap filled in this study is that other studies had first degree and master as the highest educational levels indicated to have significant positive attitude in solid waste management while this study has PhD as the highest level of education with a significant positive influence on their attitude towards solid waste management in the study area. This finding is in line with the findings of Jatau (2013) who opined that respondents with higher level of education such as B.Ed, HND, and M.Ed possessed adequate level of knowledge of the impact of improper waste disposal on health than those with lower level of education like FSLC, SSCE, and NCE.

Conclusion

Based on the results of the findings in this study, the researcher concluded that there is a significant positive influence of teachers' gender and educational level on their attitude towards solid waste management in Calabar Education Zone of Cross River State, Nigeria. Similarly, adequate solid waste management practice should be put in place with strict parameters to ensure compliance.

Recommendations

The following recommendations are made in this study based on the results of the findings;

1. There is need for students of Environmental Education as potential secondary school teachers to build up positive attitude towards solid waste management.
2. More sensitization on solid waste management should be integrated into the school curriculum with emphasis for attitude development among the males in the study area.
3. There is need for adequate policy mechanism for promotion of male and female teachers' participation in solid waste management in the study area.
4. Though teachers' attitude to solid waste management generally is significant, there is a pressing need to continue emphasizing solid waste management irrespective of gender.

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