JHER Vol. 25, No. 1, September, 2018, pp. 112 – 120

Barriers to Undergraduate Students' Participation in Solid Waste Management: A Case Study of the University of Nigeria, Nsukka

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Abstract

The study focused on proper solid waste management practices among the undergraduates of the University of Nigeria, Nsukka. Specifically, it determined barriers to undergraduate students' participation in solid waste management and ways of enhancing such participation. It was a survey. The population was made up of undergraduates. Questionnaire was used for data collection. Frequencies, percentages and Chi-square (χ^2) were used for data analysis. Findings include 13 barriers to undergraduates' proper solid waste management practices and six ways of enhancing their waste management practices. Barriers include, among others, low environmental consciousness/awareness, lack of enforcement of environmental laws, and non-adherence to policies guiding solid waste management in the school. Ways of enhancing practices, include: provision of waste bins and containers at strategic places, etc. There was no significant difference between the male and the female undergraduate students and barriers to proper solid waste management practices ($p > .05$). It was recommended, among others, that the school management should provide more waste bins at strategic places.

Keywords: Solid waste, Management, Practices, Barriers, Undergraduates

Introduction

Solid wastes refer to discarded or abandoned materials. According to Kapoor (2001) solid wastes are all wastes arising from human activities that are normally solid and are discarded as useless or unwanted. Aibor and Olurunda (2006) defined solid waste as unwanted or any discarded material arising from human activities and is not free flowing. Waste management is the systematic administration of activities which provide for the collection, sorting, separation, storage, transportation, processing and disposal of solid waste (Frick & Sullivan, 2007). Solid wastes in this study are dry wastes which are useless and discarded and which are brought

about as a result of undergraduates' activities. The solid waste so generated must be properly disposed of to guarantee an environment conducive to health. Effective disposal of solid waste depends largely on the quality of solid waste management practices, and the types of solid waste generated.

Solid waste management is one of the most challenging environmental problems facing human beings especially in the developing countries (Agboje, Adeoti, & Irhivben, 2014). Solid wastes management is arguably the most important municipal service (World Bank, 2012) because of the amount of waste generated by human beings. World Bank (2012) indicates that in 2002 there were 2.9 billion urban residents who generated about 0.64 kg of municipal solid waste per person per day (0.68 billion tonnes per year) and estimates currently, these amounts have increased to 3 billion residents generating 1.2 kg per person per day (1.3 billion tonnes per year).

Management is the art of controlling and handling of something in order to be successful. Management according to Harold (2011) is the art of getting things done through and with people in formerly organized groups. Boundless (2017) also defined management as the act of getting people together to achieve desired goals and objectives using available resources efficiently and effectively. Management is the act of handling and controlling of solid waste by the undergraduates to avoid littering the environment and reducing health hazards caused by improper management of solid waste.

Solid waste management is the most pressing environmental challenge faced by urban and rural areas of Nigeria (Agboje, Adeoti, & Irhivben, 2014; Wale, 2016). Wale also explained that Nigeria, with population exceeding 170 million, is one of the largest producers of solid waste in Africa, despite a host of policies and regulations, guiding solid waste management in the country. Wale also reported that Nigeria generates around 3.2 million tons of solid waste annually, out of which only 20-30 percent is collected making the environment dirty and harmful to inhabitants. Babayemi, Ogundirian, and Osinbanjo (2017) reported that uncontrolled electronic waste, agricultural waste, scrap metals, waste polymers, and waste from transportation sector are prevalent in Nigeria. University environment is not an exception, as some parts of the environment are seen littered with piece of papers, waste food packs, polyethene bags, among others. These are mainly due to the activities of students, majority of who are undergraduates of the University.

An ideal University environment should always be clean and devoid of solid wastes. There should be proper solid waste management practices including generation, collection, storage, transportation and disposal of solid waste by inhabitants (Amori, Fatile, Ihuoma & Omoregbee, 2013). This is expected to promote healthy

environment on campus. Healthy environment prevents rodents, mosquitoes and other flies, thereby preventing related diseases (WHO, 2018). It is observed that University of Nigeria, Nsukka make provisions for proper disposal of solid wastes but improper disposal however, often occur in some parts of the University environments, especially in classrooms and hostel areas, thereby, defacing its scenic and aesthetic beauty in spite of the fact that waste baskets or bins are been provided for the undergraduates to dispose solid wastes therein. This suggests that there may be factors militating against undergraduates' proper solid waste disposal practices in the university, which had not being identified or considered as a problem.

Purpose of the Study

The purpose of this study was to find out the barriers to students' solid waste management practices among the undergraduates of the University of Nigeria, Nsukka. Specifically, the study determined the;

1. barriers to undergraduate students' participation in solid waste management.
2. ways of enhancing the students' participation in solid waste management practices.

Research questions

1. What are the barriers to undergraduate students' participation in solid waste management?
2. What are the ways of enhancing students' participation in solid waste management?

Hypothesis (HO)

The following null hypothesis was formulated and tested at .05 level of significance.

1. There is no significant difference on the barriers to undergraduate students' participation in solid waste management based on gender.

Methodology

***Design of the Study*:** descriptive survey design was adopted for the study.

***Population for the Study*:** The population for the study consisted of 19,973 undergraduates of University of Nigeria, Nsukka. These were made up of 10,153 males and 9,820 females in ten faculties of the University of Nigeria, Nsukka (Academic Planning Unit, June 2017).

***Sample for the Study*:** The sample size for the study consisted of 392 undergraduates. Multistage sampling procedure was used. First step involved random selection of four faculties from the 10 faculties in the University. The second step involved random selection of two departments from each of the four faculties. This gave a total of eight departments. The third step involved the use of accidental sampling technique to select 49 students from each of the eight departments, giving a total of 392 students who constituted the sample for the study.

***Instrument for Data Collection*:** Questionnaire was used for data collection. The questionnaire was divided into three sections; A, B and C, covering demographic variables; barriers to proper solid waste management practices, and ways of improving solid waste management practices, respectively. The instrument was validated by three experts in Human Kinetics and Health Education. Their suggestions were used to modify and improve the instrument. Split-half method using Kuder-Richardson-20 was used to determine the reliability of the instrument. A reliability coefficient index of 0.82 was obtained and the instrument was judged reliable.

***Method of Data Collection*:** A total of 392 copies of the questionnaire were administered by the researcher and assistants (students) to the respondents by hand. Three hundred and eighty-seven (387) completed copies of the questionnaire were retrieved from the respondents. This represents 98.7 percentage return.

***Method of Data Analysis*:** Data collected were analyzed using frequencies and percentages. The hypotheses were tested using chi-square (χ^2) statistics at .05 level of significance.

Results

Demographical Characteristics of Respondents

Data on demographical characteristics of the students show that majority (68.9%) were between the age of 21 and 30 years, followed by those aged 20 years and below (28.3%). There were more females (63.0%) than males (36.5%). For level of study, the distribution was as follows: first years (18.9%), second years (22.4%), third years (23.0%), fourth years (12.0), fifth years (8.4%) and final years (15.3%).

Table 1: **Percentage Responses and Chi-square Analysis on Barriers to Undergraduate Students' Participation in Solid Waste Management based on Gender (n=387)**

S/N	Perceived Barriers	Male(143) f(%)	Female(244) f(%)	Total f(%)	Chi-Square (χ^2)	(p-value)
1	Low environmental awareness among students	120(84.5)	216(89.3)	336(86.8)	1.845	.174
2	Lack of enforcement of environmental laws	125(88.7)	204(86.8)	329(85.1)	.274	.601
3	Poor environmental sanitation monitoring by student union executives or other authorities	117(83.0)	206(84.1)	323(83.5)	.080	.778
4	Indifferent attitudes towards the undergraduates' responsibilities	123(86.6)	195(83.3)	318(82.2)	.732	.392

5	Undergraduates' lack of awareness of their own responsibilities to their environment	120(84.5)	195(83.3)	315(81.4)	.090	.765
6	Poor coordination among environment agencies in the school	115(81.0)	195(81.9)	310(80.1)	.053	.818
7	None adherence by undergraduates to policies guiding solid waste management in the school	108(75.5)	200(81.6)	308(79.6)	2.058	.151
8	Ignorance of the effects of improper solid waste management practice to health and the environment	108(75.5)	183(75.3)	291(75.2)	.002	.962
9	Lack of motivation among students for solid waste management exercises	110(77.5)	165(69.6)	275(71.1)	2.744	.098
10	Lack of information about solid waste management exercises for the students	109(76.8)	165(69.3)	274(70.8)	2.443	.118
11	Limited approved dumping sites in the school	96(68.1)	145(60.2)	241(62.3)	2.396	.122
12	Absence of waste bins and waste disposal containers at strategic places for the students, such as classroom, halls of residence	96(67.6)	141(58.8)	237(61.2)	2.971	.085
13	Poor attitudes of waste disposal workers in the school	83(60.1)	154(65.0)	237(61.2)	.876	.349
14	Levies paid by undergraduates to the school and in their various hostels for sanitation	63(44.4)	95(39.6)	158(40.8)	.841	.359
	Overall	**75.1**	**73.3**	**73.0**	**1.243**	**.412**

≥ 50% is a barrier; p-value (p) ≤ .05 implies significant difference exists; otherwise (p > .05), no significance difference; df = 1

Table 1 show that 13 items are barriers to undergraduate students' participation in solid waste management. The Table further show that there is no significant difference between male and female undergraduate students' responses on barriers to proper solid waste management practices (p > .05). This implies that the perceived barriers to proper solid waste management practices were the same for both the males and females.

Table 2: **Ways of enhancing students' participation in solid waste management practices (n=387)**

S/N	Ways of Improvement	F	%
1	Provisions of waste bins and containers at strategic places like libraries, faculty theatres, GS building	371	94.6
2	Enacting policies for effective implementation of solid waste management in the school	370	94.4
3	Organizing enlightenment campaign for students about the effects of improper solid waste management practices to health	362	92.3
4	The student union executives monitoring environmental sanitation in various hostels	360	91.8
5	Improving environmental agencies coordination in the school	357	91.1
6	School administration mapping out more dumping sites	333	84.9
	Overall %		**91.5**

Table 3 shows that the majority (91.5%) of the respondents indicated that all the items are ways of improving proper solid waste management.

Discussions of Findings

Findings showed that 13 of the items as listed in Table 1 are barriers to undergraduate students' participation in solid waste management, which include among others: low environmental consciousness of the students, lack of enforcement of environmental laws, and non-adherence to policies guiding solid waste management in the school. This could be attributed to the influence of being in a learning environment and are exposed to learning in variety of ways despite the impact of such learning. Being students, and in such learning environment will likely improve the self-efficacy of the undergraduates and thus improved practices of solid waste management. These findings were not in line with the findings of Alexander, Kwame and Stephen (2014) that of all the challenges facing solid waste management practices, only institutional arrangement and adequate solid waste management laws were found not to be major challenges on assessing the challenges affecting solid waste management system in the Kumasi Metropolis. However, Nachalida, Beverley, and Kirstin (2017) identified insufficient infrastructure, weak strategic planning and unorganised waste management and fee collection system as barriers to solid waste management. Pollans (2017) reported limited enforcement of existing policy as one of the barriers to sustainable waste management.

Findings showed that the percentage of males that perceived the items as barriers to undergraduate students' participation in solid waste

management practices was higher than females. However, the difference was not significant. Table 1 showed that there is no significant difference between male and female undergraduate students' responses on barriers to proper solid waste management practices. These findings were in contrast with the findings of Ugwu, Ubele and Nwankwo (2014) that the female residents of Obollo-Afor had better practice of liquid and solid waste than their male counterparts.

Results showed that all the items on ways of enhancing students' participation solid waste management were indicated by the majority of the respondents. These findings support the view of Ramatta, Dennis and Philip (2014) that proper education of the public, the provision of more communal trash bins, and the collection of waste by private contractors could help prevent exposing the public to diseases as they investigate the domestic waste practices, waste disposal, and perceptions about waste and health in an urban community in Accra. The findings is also in line with the findings of Ugwu, Ubele and Nwankwo (2014) who asserted that seminars, workshops on solid waste disposal should be carried out and compulsory introduction of legislation on waste disposal practice and its enforcement by the environmental health officer should be advocated on solid waste disposal practice among residents of Obollo-Afor in Udenu Local Government Area of Enugu State.

Conclusions

Barriers to undergraduate students' participation in solid waste management practices include among others; low environmental awareness among the students; lack of enforcement of environmental laws; undergraduates' lack of awareness of their own responsibilities to their environment; non-adherence by undergraduates to policies guiding solid waste management in the school. There was no significant difference on the barriers to undergraduate students' participation in solid waste management practices based on gender and level of study.

Ways of enhancing students' participation in solid waste management practices include among others; provision of more waste bins at strategic places like libraries, lecture theatres, General Studies building; enacting policies for effective implementation of solid waste management in the school.

Recommendations

Based on the findings of this study, the following were made;

- The school management should set up policies that will guide the effective implementation of solid waste management for students.
- The school management should as well provide more waste bins and containers at strategic places like libraries, faculty theatres, GS

building etc. for proper disposal of solid waste by the undergraduates.

- ❖ There should be enlightenment campaign which should be organized by health educators for the students to sensitize them on the effects of improper solid waste management practices to health.
- ❖ The student union executives should help in monitoring environmental sanitations carried out in various hostels at least once per semester.

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