



## Solid Waste Management Practices Among Residents of Igwuruta Ikwerre Lga, Rivers State

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### Abstract

The scope of solid waste management practices among residents of the Igwuruta community in Rivers State's greater Port Harcourt city was examined in this research paper. We created four goals, four study questions, and four null hypotheses. Descriptive survey design was the research method chosen. Yaro Yamen's formula  $n = \frac{N}{1 + N(e)^2}$  was used to pick a sample size of 360 residents of the Igwuruta community using a basic random sampling technique of balloting without replacement. The information was gathered using a structured questionnaire, and descriptive statistics such as counts and percentages from frequency tables, as well as inferential statistics such as Spearman Rank order (Rho) and Chi-square ( $\chi^2$ ), were used to show the results. According to research, Igwuruta's citizens are worried about the major environmental problems caused by solid waste management practices. The Chi-Square results show a link between respondents' background factors of sex, age, and education level with the extent of solid waste management practice. It is imperative that inhabitants of Igwuruta are made aware of the risks associated with poor solid waste management. To improve residential trash disposal, solid waste collection locations with separation capabilities should be made available locally. Sanitation rules should also be enforced, with greater fines for noncompliance.

**Key words:** solid waste, management practices, residents igwuruta ikwerre LGA, River's state

## INTRODUCTION

Due to illegal dumping of rubbish along the roadway and piles of waste on the side of the road in Igwuruta in greater Port Harcourt City of Rivers State, waste has become a widespread concern in Igwuruta in Ikwerre LGA. However, in order to assure his continued existence and survival on earth, man engages in a variety of conflicts and actions that lead to the production of solid waste and environmental damage. These wastes come in a variety of sizes and shapes, and they depend greatly on the type of food, settlement, technology, and management [1, 2].

Wastes are present everywhere there is life. The issue of garbage is typically a global phenomenon. Due to weak management structure, waste management issues only seem to be worse in developing economies since the quantity and type of waste created depends on the activities that a society engages in. Technology level and financial standing. Today, Nigeria's largest towns are scurrying to clean up huge mounds of solid garbage from their environs, including Igwuruta in the greater Port Harcourt city of Rivers State. These areas once known for their beauty, quiet, and security are now being overrun by overflowing landfills filled with mountains of solid waste produced by homes, businesses, markets, and industrial and agricultural sources [3].

The Rivers State clean air and health edict of 1990 is being violated by illegal and careless dumping of solid waste on the streets and drainages, which is something that Port Harcourt municipal environmental officials and trash contractors are powerless to stop. Solid wastes have become a common occurrence in our cities; there is no question that our cities are overrun by the problem of unclear solid trash, which frequently puts residents in danger by having harmful effects on their health and safety. Despite the fact that their effects are clear, the public uproar over the negative effects of exposed and fermenting trash and garbage has not yet been quantified.

According to reports, Nigeria produces 20 kilograms or so of home garbage per inhabitant each year. With the rise of industries in recent years, polythene and papers of various types have replaced leaves as wrapping and packing materials. According to the Nigerian Environmental study and action team, over 60% of Nigeria's wastes were generated as leaves and food residues in the 1960s. It was highlighted that Nigeria's solid waste management is characterized by inadequate collection techniques, inadequate collection system coverage, and poor disposal methods [4].

The utter lack of effective and contemporary technology in garbage management has been noticed. The first goal of solid waste management initiatives was to remove wastes from the urban core and then destroy them. Later, focus switched to waste utilization, waste reduction, management of hazardous substances through reuse and recycling, and the prevention of pollution from waste disposal. The advanced economies have created a framework for waste management that is very effective and efficient and ensures that waste is collected, stored, transported, and disposed of in a way that is least harmful to the environment. Emphasis is placed on waste sorting, recycling, and reusing, as well as other waste management techniques. [5] Wastes are defined as any solid, liquid, or gaseous emission resulting from human activities that cannot be further utilized by the organism or system producing it. Both of the aforementioned meanings refer to stuff or energy that is no longer required during or after a process. Wastes are further described as non-flowing, pointless, undesirable, or discarded resources produced by human activity. In other words, resources are being used in the wrong places, which means that wastes to one person may be raw materials to another, such as garbage used as hog fodder [6].

Despite the presence of state and local government waste management agencies as well as private waste contractors, different types of solid waste are left lying around on the streets and by the sides of the roads in Nigeria's major urban cities, including Igwuruta in the great Port Harcourt city [7].

Unhealthy solid waste disposal is one of the main issues that developing nations face. At the 1992 conference on environment and development, it was a concern that was acknowledged by every country there, and it is regarded as a significant roadblock to sustainability [8].

To overcome the current waste management issues in the Igwuruta community of the larger Port Harcourt City, residents' understanding of and attitudes toward garbage generation and disposal are crucial. The need to clarify whether there is a relationship between individual variables (age, sex, and education level) and the degree of best waste management practices among residents of Igwuruta in larger Port Harcourt City arises from the aforementioned context [9].

Particularly Igwuruta inhabitants in the broader Port Harcourt metropolis face a tremendous threat and shame from improper and careless solid waste disposal because piles of trash cover the majority of the city. The majority of the waste produced in Igwuruta is either dumped on the sides of the roads, in unapproved locations in water ways (the drainage system), or in open areas, which negatively affects the environment and aesthetics of the city, which is meant to serve as a gateway for tourists and very important people traveling on business and other adventures [10].

In actuality, wastes typically present a number of dangers to "public health" and negatively impact both flora and wildlife as well as the ecosystem [11]. Solid wastes, or garbage as they are commonly known, are wastes created in our homes, workplaces, marketplaces, and some industrial sources. They increase in volume and toxicity. To put the issues relating to the removal of trash behind us. To better understand, solve, and eradicate the elements causing the issues, we must step up our efforts. The aforementioned contexts inspired the researchers to find out how residents of Igwuruta in the Ikwere LGA and Rivers State manage their solid waste.

## **MATERIALS AND METHODS**

### **Research Design:**

The study adopted a descriptive cross-sectional, non- experimental survey, designed to determine and present such facts as they occurred at the time of research, in their natural settings.

### **Area of Study**

Igwuruta community is one of the largest communities in Ikwere Local Government Area of Rivers state. Igwuruta occupies the largest part of the greater Port-Harcourt city. It is located around and within the sight of Port-Harcourt International Airport and Amesiama sports complex. The central position of the is determined to be at 22km (Hmiles) along Port-Harcourt Owerri Road, North of Port-Harcourt capital of Rivers state. There are nine villages in Igwuruta namely: Igwuruta-Ali, Omuodukwu, Omulobo, Omuchi, Omuohia, Agbouga, Omuma, Omueke, and Omunwei. The 2006 population census puts Igwuruta population figure at about 71,933 persons. One can best imagine that this figure must have tripled by now.

**Population of the Study**

Population of the study consisted of an estimated 71,933 male and female adults in Igwuruta, Ikwere LGA of Rivers state.

**Sample and Sampling Technique**

The sample size for the study consisted of three hundred and sixty (360) adults in sample randomly drawn areas of Igwuruta, Ikwere LGA of Rivers state. For this study, the sample size was determined using Yaro Yamans formula as

$$n = \frac{n}{1+N(e)^2} \text{ Where:}$$

n = Present Population

n = Finite Population

e = The level of Significance (0.05)<sup>2</sup>

The 2006 population census figure of Igwuruta is about 71,933, using above formula  $n = \frac{n}{1+N(e)^2}$

$$\begin{aligned} & \frac{71,933}{1+71,933(0.025)} \\ & = 359.665 \\ & = 360 \end{aligned}$$

A simple random sampling technique of balloting without replacement lottery method was adopted for the selection of the sample size from the nine villages/wards of Igwuruta community. Forty (40) samples were randomly selected from each village to make up the 360-sample size,

**Instrument for the Study**

The instrument for the study consisted of self-structured questionnaire. The questionnaire comprised two (2) sections. Section A contained three (3) questions on socio-demographic variables (age, gender, and education) of the study. Section B contained five (5) questions on solid waste management practice. All the questions are closed ended and patterned into four (4) point scale of no extent, low extent, some extent, and great extent.

**Development (Construction) of the Instrument for the Study**

Primary and secondary sources were employed in the collection of data. The primary sources included the questionnaires, interviews and observation while the secondary sources were obtained from excerpts from related textbooks, journals, internets and academic works of experts and scholars on wastes management practices.

The questionnaire developed for the study contained positively and negatively keyed items in alignment with the objectives of the study. The questionnaires are made up of two sections. Section A contains Bio-data of respondents and B contains items with four-point rating scale concerning the variables under study.

**Method of Data Collection**

A letter of introduction (Appendix C) and consent was obtained from the Head of Department (HOD) of Public Health, Imo State University Owerri, to the Medical Officer of Health (MOH) Ikwere LGA, to allow entry into the various units in Igwuruta for data collection. Copies of the instrument were distributed to the adults on face-to-face basis with the help of trained research assistants and community-based escort that worked in pairs, findings were explained to the respondents. Data were collected through primary source by the use of questionnaire administered personally to the respondents who were guided. Completed questionnaires were collected on the spot. Collection of data lasted for about four weeks. All the 360 respondents filled and returned the copies of the questionnaires.

**Method of Data Analyses**

Data collected were analyzed using descriptive statistics of frequency table counts and percentages as well as inferential statistics of chi-square (x<sup>2</sup>). The level of significance was placed at 0.05 degree of freedom (df).

## RESULTS

The study was carried out to evaluate solid waste management practices among inhabitants of Igwaruta in greater Port-Harcourt city of Rivers State. A total of 360 copies of questionnaires were distributed, all filled and returned. Below is presented in tables the data collected through self-constructed questionnaire of Eight (8) questions, and results computed in percentages (%).

**Table 1; Frequency distribution of respondents' Age**

Respondent Age	F	(%)
Less than 19 years	138	38.3
20-34 years	120	33.3
34-44 years	60	16.7
45 and above	42	11.7
Total	360	100%

Table 1 above showed the frequency distribution of respondent's ages. The result of the study revealed that 138 (38.3%) of respondents are less than 19 years, 120 (33.3) are within 20 - 34 years, 60 (16.7%) are within 35 - 44 years, while 42 (11.7%) of respondents are within 45 years and above.

**Table 2; Frequency distribution of respondents' Gender**

Gender	F	(%)
Male	168	46.7%
Female	192	53.3%
Total	360	100%

Table 2 above, showed frequency distribution of respondent's sexes. The result of the study revealed 168 (46.7%) of respondents are males, while 192 (53.3%) are females.

**Table 3; Frequency distribution of respondents' level of Education**

Level of Education	F	(%)
Non-Formal Education	80	22.2
Primary Education	125	34.7
Secondary Education	105	29.2
Tertiary Education	50	13.9
Total	360	100%

Table 3 above shows the frequency distribution of respondent's level of education. The results of the study reveals that 80(22.2%) of respondents have non-formal Education, 125(34.7%) have Primary Education, 105 (29.2%) have Secondary Education, while 50 (13.9%) of respondents had Tertiary Education.

Research Question 1: What is the extent of practice of Solid waste management among residents of Igwuruta?

**Tables 4; Responses of Igwuruta resident's extent of practice of Solid waste management**

No	Questions	Responses			
1.	To what extent are you concerned about the practice of solid waste management in your environment?	No extent	Low extent	Some extent	Great extent
		65(1-8%)	90(25%)	95(26.3%)	110(30.5%)

2.	How interested are you in solid waste management in your environment?	No extent	Low extent	Some extent	Great extent
		68.(18.5%)	80(22.2%)	100(27.7%)	112(31.1%)
3.	How important do you consider the ways your neighbors dispose their solid waste?	No extent	Low extent	Some extent	Great extent
		70(19.4%)	86(23.8%)	101(28%)	103(28.6%)
4.	Are you satisfied with the ways solid wastes are disposed of in your environment?	No extent	Low extent	Some extent	Great extent
		40(11.1%)	90(25%)	135(37.5%)	95(210.3%)
5.	How satisfied are you with the way Port-Harcourt city waste contractors manage solid waste?	No extent	Low extent	Some extent	Great extent
		40(11.1%)	90(25%)	150(41%)	80(22.2%)

Table 4 above shows the frequency distribution of respondent's awareness and practice of solid waste management among residents of Igwuruta. The result of the study revealed the scores of each research question as follows: -

- Qn1. 65(18%) had no extent, 90(25%) low extent, 95(26.3%) some extent, while 110 (30.5%) great extent of concern.  
 Qn2. 68(18.5%) had no extent, 80(22.2%) low extent, 100(27.7%) some extent, while 112(31.1%) had great extent of interest.  
 Qn3 70(19.4%) had no extent, 86(23.8%) low extent, 101(28%) some extent, while 103(28.6) had great extent of importance.  
 Qn4. 40(11.1) had great extent, 90(25%), some extent, 135(37.5) low extent, while 95(26.3%) had no extent of dissatisfaction.  
 Qn5. 40(11.1) had great extent, 90(25%), some extent, 150(41.6) low extent, while 80(22.2%) had no extent dissatisfaction.

Research question 2: What is the extent of influence of gender on the practice of solid waste management among residents of Igwuruta?

#### Tables 5; Gender responses on Practice of Solid waste management

No	Gender	No extent	Low extent	Some extent	Great extent	RT
1	Male	35(20.8)	37(22%)	40(23.8)	Fi6(333)	168
	Female	30(15.6)	53(27.6)	55(28.6)	54(28.1)	192
2.	Male	33(19.6)	40(23.8)	46(27.3)	1 49(29.1)	168
	Female	35(18.2)	40(20.8)	54(28.1)	63(30.8)	192
3.	Male	33(19.6)	42(25%)	43(26.5)	50(29.7)	168
	Female	37(19.2)	44(22.9)	58(30.2)	53(27.6)	192
4.	Male	18(10.7)	43(25.5)	65(38.6)	42(25%)	168
	Female	22(11.4)	47(24.4)	70(36.4)	53(27.42)	192
5.	Male	18(10.7)	40(23.8)	72(42.8)	38(22.8)	168
	Female	22(11.4)	50(26%)	78(40.6)	42(21.8)	192
Total	Male	137	202	266	235	840
	Female	146	234	315	265	960

Table 5 above shows the frequency distribution of respondent's gender. The finding results revealed the scores for each Research question as shown below.

**Qn1;** 35(20.8%) and 30(15.6) of males and female's respondents had no extent, 37(22%) and 53(27.6) of males and females had low extent, 40(23.8) and 55(28.6) of males and females had some extent, while 56(33.3) and 54(28.1) of males and females had great extent of concern.

**Qn2;** 33(19.6) and 35(18.2) of males and females had no extent, 40(23.8) and 40(20.8) males and females had low extent, 46(27.3) and 54(28.1) males and females had some extent, while 49(29.1) and 63(32.8) males and females had great extent of interest.

**Qn3;** 33(19.6) and 37(19.2) males and females had no extent, 42(25%) and 44(22.9%) males and females had low extent, 43(25.5) and 58(30.2) males and females had some extent, while 50(29.7) and 53(27.6) had great extent of importance.

**Qn4;** 18(10.7%) and 22(11.4) males and females had no extent, 43(25.5) and 47(24.4) males and females had low extent, 65(38.6) and 70(34.4) had some extent, while 42(25%) and 53(27.4) had great extent of dissatisfaction.

**Qn5;** 18(10.7) and 22(11.4) males and females had no extent, 40(23.8) and 50(46%) had low extent, 72(42.8) and 78(40.6) had some extent, while 38(22.6) and 42(21.8) males and female's respondents had great extent of dissatisfaction.

Research Question 3; What is the extent of influence of age on the practice of solid waste management among residents of Igwuruta?

**Table\_6: Age responses on the extent of practice of solid waste management among residents of Igwuruta**

No	Age	Responses				
		No extent	Low extent	Some extent	Great extent	Total
1.	Less than 19 years	25(18.1)	35(25.5)	35(25.5)	43(31.3%)	138
	20 - 34 years	20(16.6)	30(25%)	30(25%)	40(33.3)	120
	35-44 years	15(25)	20(33.3)	20(33.3)	5(8.3)	60
	45 years	5(11.9)	5(11.9)	10(23.8)	22(52.3)	42
2	Less than 19 years	28(20.2)	25(18.1)	35(25.3)	50(36.2)	138
	20-34 years	20(16.6)	30(25%)	30(25%)	40(33.3)	120
	35-44 years	15(25)	20(33.3)	20(33.3)	5(8.3)	60
	45 years	5(11.9)	5(11.9)	15(35.7)	17(40.4)	42
3	Less than 19 years	28(20.2)	30(21.7)	35(25.3)	45(32.6)	138
	20 - 34 years	22(18.3)	31(25.8)	30(25)	37(30.8)	120
	35-44 years	15(25)	20(33.3)	20(33.3)	5(8.3)	60
	45 years	5(11.9)	5(11.9)	16(38%)	16(38%)	42
4	Less than 19 years	8(5.7)	35(25.3)	60(43.4)	35(25.3)	138
	20 - 34 years	16(12.5)	35(29.1)	40(39.3)	30(25%)	120
	35-44 years	10(16.6)	16(25%)	20(33.3)	16(25%)	60
	45 years	7(16.6)	5(11.9)	15(36.7)	15(36.7)	42
5.	Less than 19 years	18(13)	40(26.9)	50(36.2)	30(21.7)	138
	20 - 34 years	10(8.3)	25(20.8)	65(54.1)	20(16.6)	120
	35-44 years	5(8.3)	16(25%)	20(33.3)	20(33.3)	60
	45 years	7(16.6)	10(23.8)	15(35.7)	10(23.8)	42

**Table 6 above shows the frequency distribution of respondent's ages.**

The results of the study revealed the scores of each question as follows: -

**Qn1;** Less than 19 years, 25(18.1) had no extent, 35(25.3) had low extent, 35(25.3) had some extent, and 43(31.3) had great extent of concern. 20 - 34 years, 20(16.6) had no extent, 30(25%) had low extent, 30(25%) had some extent, while 40(33.3) had great extent of concern. 35 - 44 years, 15(25%) had no extent, 20(33.3) had some extent, 20(33.3) are concerned, and 5(8.3) had great extent of concern. 45 years and above, 5(11.9) are not sure, 5(11.9) are not concerned, 10(23.8) are concerned, while 22(53.3) are very concerned.

**Qn2.** Less than 19 years, 28(20.2) had no extent, 25(18.1) had low extent, 35(25.3) had some extent, while 50(36.2) had great extent of interest. 20 - 34 years, 20(16.6) had no extent, 30(25%) had low extent, 30(25%) had some extent, and 40(33.3) had great extent of interest.

35 - 44 years, 15(25%) had no extent, 20(33.3) had low extent, 20(33.3) had some extent, while 5(8.3) had great extent of interest.

45 years and above, 5(11.9) had no extent, 5(11.9) had low extent, 15(35.7) had some extent, while 17(40.1) had great extent of interest.



**Qn3.** Less than 19 years, 28(20.2) had no extent, 30(21.7) had low extent, 35(25%) had some extent, and 45(32.6) had great extent of importance.

20 - 34 years, 22(18.3) had no extent, 31(25.8) had low extent, 30(25%) had some extent and 37(30.8) had great extent of importance.

35 - 44 years, 15(25%) had no extent, 20(33.3) low extent, 20(33.3) some extent, while 5(8.3) great extent of importance. 45 years and above, 5(11.9) no extent, 5(11.9) low extent, 16(38%) some extent, while 16(38%) great extent of importance.

**Qn4;** Less than 19 years, 85.7) no extent, 35(25.3) low extent, 60(43.4) some extent, while 35(25.3) great extent of dissatisfaction.

20 - 34 years, 15(12.5%) had no extent, 35(79.1) low extent, 40(33.3) some extent, while 30(25%) had great extent of dissatisfaction.

35-44 years, 10(16.6) had no extent, 15(25%) low extent, 20(33.2) some extent, while 15(25%) had great extent of dissatisfaction.

45 years and above, 7(16.6) had no extent, 5(11.9) low extent, 15(35.7) some extent, while 15(35.7) had great extent of dissatisfaction.

**Qn5;** Less than 19 years, 18(13%) had no extent, 40(28.9) low extent, 50(36.2) some extent, while 30(21.7) had great extent of dissatisfaction.

20 - 34 years, 10(8.3) had no extent, 25(20.8) low extent, 65(54.1) some extent, while 20(16.6) had great extent of dissatisfaction.

35 - 44 years, 5(8.3) had great extent, 15(25%) some extent, 20(33.3) low extent, while 20(33.3) had no extent of dissatisfaction.

45 years and above, 7(16.6) had no extent, 10(23.8) low extent, 15(35.7) some extent, while 10(23.8) had great extent of dissatisfaction.

**Qn4.** What is the extent of influence of level of Education on the practice of solid waste management among residents of Igwuruta?

**Table 7; Respondents' level of Education**

No	Level of Education	Responses				
		No extent	Low extent	Some extent	Great extent	Total
1.	Non formal Education	20(25%)	30(37.5)	20(25%)	10(12.5)	80
	Primary Education	30(24%)	35(28%)	25(20%)	35(28%)	125
	Secondary Education	10(9.5)	17(16.1)	35(33.3)	43(40.9%)	105
	Tertiary Education	5(10%)	8(16%)	15(30%)	22(44%)	50
2	Non formal Education	23(28.7)	30(37.5)	20(25%)	7(8.7)	
	Primary Education	30(24%)	25(20%)	28(22.4)	42(33.6)	
	Secondary Education	10(9.5)	17(16.1)	40(38%)	38(36.1)	
	Tertiary Education	5(10%)	8(16%)	12(24)	25(50%)	
3	Non formal Education	25(31.2)	30(37.5)	20(25%)	5(6.2)	
	Primary Education	30(24%)	30(24)	28(22.4)	37(29.6)	
	Secondary Education	10(9.5)	18(17.1)	40(38%)	37(35.2)	
	Tertiary Education	5(10%)	8(16%)	13(26%)	24(48%)	
4	Non formal Education	20(25%)	30(37.5)	17(21.2)	13(16.2)	
	Primary Education	10(8.9)	33(26.4)	65(52%)	17(13.6)	
	Secondary Education	5(4.7)	17(16.1)	38(36.1)	45(42.8)	
	Tertiary Education	5(10%)	10(20%)	15(30%)	20(40%)	
5.	Non formal Education	20(25%)	30(37.5)	17(21.2)	13(16.2)	
	Primary Education	10(8.9)	33(26.4)	65(52%)	17(13.6)	
	Secondary Education	5(4.7)	17(16.1)	53(50.4)	30(28.5)	
	Tertiary Education	5(10%)	10(20%)	15(30%)	20(40%)	

Table 7 above shows frequency distribution of respondents' level of education. The results of the study revealed the scores as follows.

**Qn1.** Non-formal Education showed that 20(25%) had no extent, 30(37.5) low extent, 20(25%) some extent,

while 10(12.5) had great extent of concern.

Primary Education, 30(24%) had no extent, 35(28) low extent, 25(20%) some extent, while 35(28%) had great extent of concern.

Secondary Education showed that 10(9.5) had no extent, 17(16.1) low extent, 35(33.3) some extent, and 43(40.9) had great extent of concern.

Tertiary Education showed that 5(10%) had no extent, 8(16%) low extent, 15(30%) some extent, while 22(44%) had great extent of concern.

**Qn2.** Non-formal Education revealed 23(28.7) no extent, 30(37.5) low extent, 20(25%) some extent, and 7(8.7) had great extent of interest. Primary Education revealed 30(24%) had no extent, 25(20%) low extent, 28(22.4) some extent, while 42(33.6) had great extent of interest. Secondary Education, 10(9.5) no extent, 17(16.1) low extent, 40(38%) some extent, while 38(38%) had great extent of interest. Tertiary Education showed that 5(10%) had no extent, 8(16%) low extent, 12(24%) some extent, and 25(50%) had great extent of interest.

**Qn3.** Non-formal Education indicated 25(31.2) no extent, 30(37.5) low extent, 20(25%) some extent, while 5(6.2) had great extent of importance. Primary Education indicated 30(24%) no extent, 30(24%) low extent, 28(22.4) some extent, and 37(29.6%) had great extent of importance. Secondary Education indicated 10(9.5) no extent, 18(17.1) low extent, 40(38%) some extent, and 37(35.2%) had great extent of importance.

Tertiary Education indicated 5(10%) no extent, 8(16%) low extent, 13(26%) some extent, and 24(48%) great extent of importance.

**Qn4.** Non-formal education revealed 20(25%) no extent, 30(37.5) low extent, 17(21.2) some extent, while 13(16.2) great extent of dissatisfaction.

Primary education revealed 10(8%) no extent, 33(26.4) low extent, 65(52%) some extent, while 17(13.6) great extent of dissatisfaction.

Secondary education revealed 5(4.7%) no extent, 17(16.1) low extent, 38(36.1) some extent, and 45(42.8) great extent of dissatisfaction. Tertiary education revealed 5(10%) no extent, 10(20%) low extent, 15(30%) some extent and 20(40%) great extent of dissatisfaction.

**Qn5.** Non-formal Education showed 20(25%) had no extent, 30(37.5) low extent, 17(21.2) some extent, while 13(16.2) had great extent of dissatisfaction. Primary education showed 10(8%) no extent, 33(26.4) low extent, 65(52%) some extent, while 17(13.6) had great extent of dissatisfaction. Secondary education showed 5(4.7) no extent, 17(16.1) low extent, 53(50.4) some extent, while 30(28.5) had great extent of dissatisfaction. Tertiary education showed 5(10%) no extent, 10(20%) low extent, 15(30%) some extent and 20(40%) had great extent of dissatisfaction.

## DISCUSSION

The data in Table 4, using Percentages, the item by item showed that only 18% and 25% of the respondents indicated no extent and low extent of concern about the solid waste around their domain, 26.3% and 30.5% indicated some extent and great extent of concern respectively. 31.1% showed great extent and 27.7 some extent of interest in solid waste management in their domain, while about 56.6% attached great extent of importance on the way their neighbors dispose their solid waste. 23.8% and 19.4% of respondents showed low extent and no extent respectively. More than half (63.8%) of the respondents expressed great extent of dissatisfaction with the way solid waste are disposed within their domain, while 25% and 11.1% expressed low extent and no extent. On how satisfied they were with waste contractors handling solid waste, 22.2% and 41.6% responded great extent and some extent of dissatisfaction, while 25% and 11.1% showed low extent and no extent respectively. Subjecting the respondent's scores to Chi-square correlation further revealed significant difference in the practice of solid waste management by residents of Igwuruta, since  $X^2_0$  (44.95) is greater than  $X^2_e$  (21.02) at df: 12 and  $P < .05$  [12]

The data in table 5, using percentages, item by item revealed that 33.3% (males) as against 28.12 (females) had great extent of concern, and 28.6% (females) as against 23.8% (males) had some extent of concern about solid waste in their environment, while 27.6% (females) against 22% (males) and 20.8% (males) and 15.6% (females) had low extent and no extent respectively. 30.8% females against 29.1% (males) and 28.1% (females) against 27.3% (males) responded great extent and some extent of interest, while 23.8% (males) and 20.8% (females) responded low extent, and only 19.6% (males) and 18.2% (females) no extent. About 44.6% (males) and 42.1% (females) attached low extent and no extent of importance about solid waste disposal by their neighbors, while 55.2% (males) and 57.8% females placed some extent and great extent of importance on the ways their neighbors dispose solid waste in their environment, 10.7% (males) against 11.4% (females) had low extent of dissatisfaction with how their neighbors dispose their solid waste, while 38.6% (males) against 36.4% (females), and 25% (males) against 27.6% (females) placed some extent and great extent of dissatisfaction with the ways their neighbors dispose solid waste. On how satisfied they are with the way solid



waste are managed by waste contractors in Igwuruta, 10.7% (males) and 11.42 (females) had no extent, 23.8 (males) and 26% (females) low extent, while 42.8% (males) against 40.6% (females) some extent, and 22.6% (males) and 21.8% (females) had great extent of dissatisfaction.

Computing above percentages scores, there is a 9.01% (no extent and low extent of concern) and 2.1% (some extent and great extent of concern) difference in the practice of solid waste management among males and females residents of Igwuruta. The females have higher Practice than the males with 2.1% (some extent and great extent of concern) and lower than males by 9.01% (no extent, and low extent). Furthermore, the Chi-square correlation co-efficient showed a significant difference in the practice of solid waste disposal among males and females residents of Igwuruta. The  $X^2_o$  (13.1) is greater than  $X^2_e$  (7.8) at  $df:3$  and  $P<.05$  [13].

The data in table 6, using percentages, the item by item showed that 31.3% respondents of ages less than 19 years had great extent of concern about solid waste in their environment, 25.3% each had some extent and low extent, while only 18.1% of the respondents had no extent of concern of solid waste in their environment. 16.6% of respondents of 20-34 years had no extent of concern in solid waste in their environment, 25% each had low extent and some extent of concern, while 33.3% had great extent of concern in solid waste in their environment. Only 3% of respondents 35-44 years expressed great extent of concern, 33.3% each had some extent and low extent of concern, while 25% of respondents had no extent. 11.9% each of respondents above 45 years had no extent and low extent, 23.8% some extent, while 53.3% had great extent of concern. 36.2% and 25.3% of respondents less than 19 years had great extent and some extent of interest, while 20.2% and 18.1% had no extent and low extent of interest in the solid waste in their environment. 33.3% and 25% respondents from 20 - 34 years placed great extent and some extent of interest, while 25% and 16.6% had low extent and no extent of interest. Only 8.3% of respondents 35-44 years had great extent of interest, 33.3% had some extent, while 33.3% and 25% had low extent of interest and no extent, 40.1% of respondents 45 years and above had great extent of interest, 35.7% had some extent, 11.9% each had low extent and no extent. 32.6% and 25% of respondents less than 19 years placed great extent of importance to the ways their neighbors handle solid waste in their environment, 21.7% and 20.2% attached low extent of importance and had no extent. 18.3% and 25.8% of 20-34 ages had no extent and low extent, while 25% and 30.8% placed great extent of importance in the ways their neighbors do away with solid waste. 25% and 33.3% of ages 35 - 44 had no extent and placed low extent of importance, while 33.3% and only 5.3% placed some extent and great extent of importance. 11.9% each of ages 45 years and above had no extent and low extent of importance, while 38% each placed some extent and great extent of importance in the ways their neighbors dispose off solid waste in their environment. 31% of respondents less than 19 years placed low extent of dissatisfaction with their neighbor's ways of solid waste disposal, while 68.7% placed great extent of dissatisfaction. 41.6% of respondents 20-34 ages placed low extent of dissatisfaction with the ways their neighbors dispose solid waste, while 58.3% placed great extent of dissatisfaction. Also 41.6% of respondent ages 35-44 years had low extent of dissatisfaction, while 58.2% had great extent of dissatisfaction. Only 28.5% of respondents 45 years and above had no extent of dissatisfaction and 71.4% had great extent of dissatisfaction. 57.9% of respondents less than 19 years had great extent of dissatisfaction with the ways solid waste are being handled by Port Harcourt city waste contractors, while 41.9% had low extent. Only 29.1% of respondents 20 - 34 years had low extent of dissatisfaction, and 70.7% had great extent. 33.3% of respondents 35 - 44 years had low extent, while 66.6% had great extent of dissatisfaction. 40.4% of respondents 45 years and above had low extent and 59.5% had great extent of dissatisfaction.

From above percentages scores, ages 45 years and above have the highest practice of solid waste management, with a difference of 29.6% (some extent and great extent), and lowest by 18.5% (no extent and low extent). Ages less than 19 years is second higher with a difference of 24.9% and 20% lower. Ages 20 - 34 years is next with 24.8% high and 26.2% low, followed by ages 35 - 44 years with very low practice of solid waste management.

Furthermore, the Chi-square analysis presented in table 6 indicated significant difference between Igwuruta residents background variable of age and practice of solid waste management [14].

The data in table 7 using percentages, the item by item revealed that only 12.5% of respondents with no formal education had great extent of concern with solid waste in their environment, 25% had some extent, while 37.5% and 25% low extent and no extent of concern. 32% and 20% of respondents with Primary education, had great extent and some extent of concern respectively, while 28% and 24% were low extent and no extent. 36.1%

and 33.3% respondents of secondary education had great extent and some extent of concern, while 16.1% and 9.5% had low extent and no extent. 44% and 30% respondents of tertiary education had great extent and some extent of concern, while 16% and 10% had low extent and no extent. Only 8.7% and 25% respondents with no formal education had great extent and some extent of interest, 37.5% and 28.7% had low extent and no extent of interest. 24% and 20% respondents of Primary education had no extent and low extent of interest, while 22.4% and 33.6% had some extent and great extent of interest. 36.1% and 38% respondents with secondary education had great extent and some extent of interest, while only 9.5% and 16.1% had no extent and low extent of interest. Only 10% and 16% respondents with tertiary education had no extent and low extent of interest, while 24% and 50% had some extent and great extent of interest, in solid wastes on their environment. 37.5% and 31.2% respondents with no formal education placed no extent and low extent of importance in the way their neighbors dispose their solid waste, while 25% and only 6.2% placed some extent and great extent of importance. 29.6% and 22.4% respondents with Primary education placed great extent and some extent of importance, while 24% each placed no extent and low extent. Only 9.5% and 17.1% respondents of secondary education placed no extent and low extent of importance, while 38% and 35.2% placed some extent and great extent of importance. 48% and 26% respondents of tertiary education placed great extent and some extent of importance, while 16% and only 10% placed low extent and no extent. Only 16.2% and 21.2% respondents of non-formal education great extent and some extent of dissatisfaction with the ways their neighbor dispose their solid wastes, while 37.5% and 25% placed low extent and no extent. Only 8% and 26.4% Primary education placed no extent and low extent of dissatisfaction [15,16] while 52% and 13.6% placed some extent and great extent of dissatisfaction. 42.8% and 36.1% respondents of secondary education placed great extent and some extent of dissatisfaction, while 16.1% and 4.7% low extent and no extent. 10% and 20% respondents of tertiary education placed no extent and low extent, while 30% and 40% placed some extent and great extent of dissatisfaction. 25% and 37.5% respondents of non-formal education had no extent and low extent of satisfaction with the ways solid wastes are being handled by Port Harcourt city wastes contractors, while 21.2% and 16.2% had some extent and great extent of dissatisfied. 8% and 26.4% respondents of primary education had no extent and low extent, while 52% and 13.6% had some extent and great extent of dissatisfaction. 4.7% and 16.1% respondents of secondary education had no extent and low extent, while 50.4% and 28.5% had some extent and great extent of dissatisfaction. 10% and 20% respondents of tertiary education had no extent and low extent, while 30% and 40% had some extent and great extent of dissatisfaction [17,18].

Comparing the average percentage scores by respondents of all level of education, secondary education had the highest average scores of 75.9% practice of solid waste management, followed by tertiary education (72.4%). then primary education with 59.4% and lastly non-formal education with 35.4%, while non-formal education had the lowest score at 64.3% practice, followed by primary education with 42.6%, followed by tertiary with 27.6% and lastly secondary education with 24.3% respectively.

Also, the Chi-Square analysis presented table 4.7 revealed a significant influence of level of education on the practice of solid waste management among residents of Igwuruta, since the calculate Chi-square ( $X^2_o$ ) = 208.70 is greater than critical Chi-square ( $X^2_e$ ) = 16.91 at df: 9 and  $P < .05$ .

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