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Waste Management and Health Consequences among Residents of Ajipowo Community Akure Metropolis, Ondo State Nigeria

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Abstract

It has been observed that improper waste disposal and management is common with developing countries. Based on this, the ensuing paper investigated waste management and the health impact among residents of Ajipowo community Akure metropolis, Ondo state Nigeria. A descriptive research design was adopted and the research data was collected using a well-structured, self-developed and validated questionnaire tagged (WMHCARACA). Two hundred (200) participants were used for the study. Simple frequency count, percentages and mean was used to describe the demographic characteristics of the population while the hypotheses were tested using of One Sample Kolmogorov-Smirnov Test to test the significant relationship of each of the 5 hypotheses stated in the study at 0.05 level of significance. In conclusion, the study showed that ineffective waste disposal method, improper waste management, dirty environment, non availability of waste bins and increase in population all have positive strong relationship with the health impact of residents of Ajipowo community Akure metropolis, Ondo state Nigeria. Recommendations that could enhance proper waste disposal and management were suggested in the study.

Keywords: Waste disposal, waste management, waste bin, waste collectors, health status.

Introduction

The importance of living in a clean, healthy and wholesome environment cannot be over emphasized, it has been observed that a clean environment enhances the health of residents of such environment. Garcia and Aguirre (2020) stated that improper waste disposal has become a major contributing factor to environmental degradation and incessant out break out diseases and illnesses. The amount of waste generated rises as the population of the world increases and development expand, modern lifestyle behaviours have resulted in more acute waste problems. Wastes are useless and unwanted substances that could be gaseous, solid or liquid in nature, garbage disposal at refuse dumps, abandoned non-functional electronic parts and all materials regarded as no longer useful (Omowale and Hassan, 2019). Nnamdi and Okporibogha (2019) affirmed that the need for effective management of waste is an issue that has required public health attention even when the management of the waste has been outsourced to an outside waste management service provider. It is of utmost importance to ensure that waste products are properly managed in other to prevent the occurrence of attendant problems associated with poor

waste management including water contamination, air contamination, increased prevalence of vector-borne disease, infection spread and so on. Improper waste management methods have been shown to contribute to the decrease in the quality of health of a population as a result of environmental health nuisances that have arisen as a result of this poor waste management method (Xchare and Mac-Quisere, 2021). (Smyth, Fredeen & Booth, 2010).

Wastes could be from homes, offices, industries and from other various agricultural related activities and could also be effluents arising from agricultural, industrial construction, mining and exploration or commercial activities. If these waste products are however at certain times not properly disposed or managed will in turn lead to the occurrence of environmental and public health challenges (Onwughara, Abah and Ohimain, 2017). Waste management however remains a major environmental health challenge in Nigeria which has been attributed to non availability of waste bins by residents, indiscriminate roadside refuse disposal, open dumping of waste products, absence of actionable guidelines as regards refuse dumping and refuse dump sites, inadequacy in funding, poor practice of effective waste management as well as absence of organized waste management systems and so on. (Saadat, Parvin, Alam, and Kamal, 2012).

Therefore, the study was carried out to examine waste management and the health consequences among residents of Ajipowo community Akure metropolis, Ondo state Nigeria. Ajipowo community is a popular street off Ondo road in Akure. Akure is the capital city and administrative centre of Ondo state located in the western part of Nigeria with a population of about 500,798.

Purpose of the study

The purpose of this study was to investigate waste management and the health consequences among residents of Ajipowo community Akure metropolis, Ondo state Nigeria.

Statement of the problem

It has been noticed that the challenge of ineffective and inadequate waste management system is a major problem in most communities within and outside Akure metropolis and this can be adduced to improper waste disposal and management system. The need for effective management of waste has been an issue that has required public health attention for decades. Hence, it is of utmost importance to ensure that waste products are properly disposed and managed in other to prevent the occurrence of health problems associated with poor waste management such as water contamination, air contamination, increased prevalence of vector-borne disease, infection spread and so on. In Ajipowo community, it has been observed that waste collectors seldom come around to collect waste and at the month they request for money of which services were seldom rendered. Most times the community is seen with heaps of dump site where residents dump refuse because of lack of waste bins and effectiveness of waste collectors.

Objectives of the study

The specific objectives of the study sought to:

i. Investigate the behavioural pattern of residents towards waste disposal in Ajipowo community Akure metropolis, Ondo state, Nigeria.
ii. Investigate the level of effectiveness of waste collectors in Ajipowo community Akure metropolis, Ondo state, Nigeria.
iii. Recommend solutions for proper and effective waste disposal and management system in Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Research questions

i. Will there be any significant difference between waste disposal and the health of residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria?
ii. Will there be any significant difference between waste management and the health of residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria?

Hypotheses

The following research hypothesis were formulated and tested at $p<0.05$ level of significance.

i. There is no significant difference between ineffective waste disposal method and healthy living among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.
ii. There is no significant difference between improper waste management and the prevalence of diseases and infection among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.
iii. There is no significant difference between dirty environment and the health status of residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.
iv. There is no significant difference between non availability of waste bins and proper waste disposal among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.
v. There is no significant difference between increase in population and improper waste management among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Conceptual framework

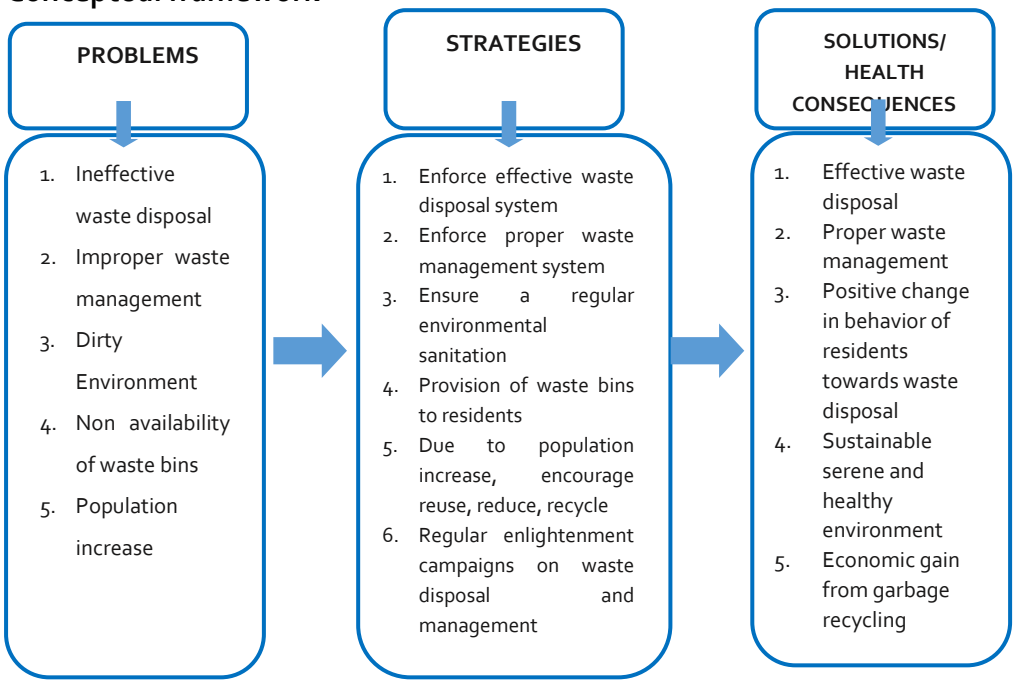

Figure 1: Flow diagram of waste management and the health consequences
Source: Xchare and Mac-Quisere Model 2021.

The conceptual framework presents the problems associated with waste disposal and management which include ineffective waste disposal, improper waste management, dirty Environment, non availability of waste bins and population increase among others. The framework as well revealed the strategies that could be deployed in tackling the problems. The strategies are enforced effective waste disposal system, enforce proper waste management system, ensure a regular environmental sanitation, provision of waste bins to residents, due to population increase, encourage reuse, reduce, recycle and regular enlightenment campaigns on waste disposal and management. The flow of the diagram also highlighted solutions to the problems of waste management if the stated strategies are followed. Hence, the outcomes are effective waste disposal, proper waste management and positive change in behavior of residents towards waste disposal. Others are sustainable serene and healthy environment and economic gain from garbage recycling.

Methodology

The study adopted a descriptive research design because it examined waste management and the health consequences among residents of Ajipowo community Akure metropolis, Ondo state Nigeria in which self-reported data were collected from sampled participants in describing the population on the relevant variables of interest without manipulating any of the variables. The population for the study consisted of a total of 200 participants who are residents of Ajipowo community Akure metropolis Ondo state, Nigeria. Participants were selected from residents of Ajipowo community, Akure metropolis, Ondo state Nigeria using

the multistage sampling technique. Purposive sampling technique was used to select Ajipowo community in Akure. The participants were stratified by gender, age, and academic qualification. Simple random sampling technique was used to select 20 participants from each of the 10 quarters that comprise of Ajipowo community. Making a total of 200 participants that took part in the study out of the over (5000) residents of Ajipowo community. A self-designed questionnaire tagged waste management and the health impact among residents of Ajipowo community Akure metropolis, Ondo state Nigeria (WMHCARACA) that were in English and Yoruba version was used to elicit information from the participants. The instrument consisted of two sections identified as sections A and B. Section A contained demographic characteristics of the respondents. In section B, the items were designed to ask specific questions directed towards waste management and the health impact among residents of Ajipowo community Akure metropolis. The 15-item questionnaire in this section was assessed on a four-point rating scale ranging from 4 strongly agreed, 3 agreed, 2 disagree and 1 strongly disagree as indicated below.

Items	**SA**	**A**	**D**	**SD**
Positive items	4	3	2	1
Negative items	1	2	3	4

A reliable coefficient of 0.86 was obtained through the use of Pearson Product Moment Correlation Analysis. Therefore, the instrument was considered adequate and appropriate enough to be used for data collection for the study.

Administration of research instrument

Copies of the questionnaire were administered to the residents of Ajipowo community on a scheduled meeting day of landlord association. The participants independently spent a minimum of 7 minutes on the average to carefully and accurately complete the questionnaire as it decreased the possibilities of sharing opinion and discussing the questionnaire items. Submission was done individually and a hundred percent return rate was achieved.

Data analysis

Completed copies of the questionnaire were collected, coded and analyzed using both descriptive and inferential statistics. The descriptive statistics of frequency count and percentage were used to analyze the demographic information, while inferential statistics of One-Sample Kolmogorov-Smirnov Test was used to test hypotheses 1 to 5 all at 0.05 alpha level of significance.

Demographic information

Table 1: Demographic information of respondents

Variables	Description	Frequency	Percentage
Gender	Male	100	60%
	Female	80	40%
	Total	**200**	**100%**
Age	30-35	5	2.5%
	36-40	5	2.5%
	41-45	30	15%
	46-50	30	15%
	51-55	50	25%
	56-60	30	15%
	61-65	20	10%
	66-70	20	10%
	71-75	5	2.5%
	76-80	5	2.5
	80 and above	0	0
	Total	**200**	**100%**
Academic qualification	Pry 6	5	2.5%
	JSS3	0	0%
	SSCE/WAEC	50	25%
	OND	20	10%
	HND/BSc	50	25%
	MSc/Med	20	10%
	Ph.D	5	2.5%
	No Certificate	50	25%
	Total	**200**	**100%**

The analysis of the demographic variables is presented in table 1

Table 1 showed the demographic characteristics of participants. The result showed that male participants are 100 (60%), female participants are 80 (40%). Participants between the age-range of 51-55 (50%) while participants between the age ranges of 30-35, 36-40, 71-75, 76-80 are 5 (2.5%) respectively. Distribution according to academic qualification showed that participants with SSCE/WAEC and HND/BSC certificates are 50 (25%) respectively while participants with no certificate at all are also 50 (25%).

Hypotheses Testing

Hypothesis 1

There is no significant difference between ineffective waste disposal method and healthy living among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Table 2: Summary of One sample Kolmogorov-Smirnov Test analysis showing difference between ineffective waste disposal method and healthy living among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Variable Description	Test	N	Mean±SD	Sig	Decision
Ineffective waste disposal method and healthy living	One-sample Kolmogorov Test	200	2.52±0.41	0.00	Reject null hypothesis

Asymptotic significance at 0.05 level 'Lillefors corrected'

One sample Kolmogorov-Smirnov Test was run to determine the difference between ineffective waste disposal method and healthy living among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria. From table 2 above, the results revealed a strong relationship between ineffective waste disposal method and healthy living at a P value=0.00 hence, the null hypothesis was rejected.

Hypothesis 2

There is no significant difference between improper waste management and the prevalence of diseases and infection among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Table 3: Summary of One sample Kolmogorov-Smirnov Test analysis showing difference between improper waste management and the prevalence of diseases and infection among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Variable Description	Test	N	Mean±SD	Sig	Decision
Improper waste management and the prevalence of diseases and infection	One-sample Kolmogorov Test	200	2.63±0.60	0.00	Reject null hypothesis

Asymptotic significance at 0.05 level 'Lillefors corrected'

One sample Kolmogorov-Smirnov Test was run to determine the difference between improper waste management and the prevalence of diseases and infection among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria. From table 3 above, the results revealed a strong relationship between improper waste management and the prevalence of diseases and infection at a P value=0.00 hence, the null hypothesis was rejected.

Hypothesis 3

There is no significant difference between dirty environment and the health status of residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Table 4: Summary of One sample Kolmogorov-Smirnov Test analysis showing difference between dirty environment and the health status of residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Variable Description	Test	N	Mean±SD	Sig	Decision
Dirty environment and the health status of residents	One-sample Kolmogorov Test	200	3.81±0.70	0.00	Reject null hypothesis

Asymptotic significance at 0.05 level 'Lillefors corrected'

One sample Kolmogorov-Smirnov Test was run to determine the difference between dirty environment and the health status of residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria. From table 4 above, the results revealed a strong relationship between dirty environment and the health of residents at a P value=0.00 hence, the null hypothesis was rejected.

Hypothesis 4

There is no significant difference between non availability of waste bins and proper waste disposal among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Table 5: Summary of One sample Kolmogorov-Smirnov Test analysis showing difference between non availability of waste bins and proper waste disposal among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Variable Description	Test	N	Mean±SD	Sig	Decision
Non availability of waste bins and proper waste disposal.	One-sample Kolmogorov Test	200	3.55±0.65	0.00	Reject null hypothesis

Asymptotic significance at 0.05 level 'Lillefors corrected'

One sample Kolmogorov-Smirnov Test was run to determine the difference between non availability of waste bins and proper waste disposal among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria. From table 5 above, the results revealed a strong relationship between non availability of waste bins and proper waste disposal among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria at a P value=0.00 hence, the null hypothesis was rejected.

Hypothesis 5

There is no significant difference between increase in population and improper waste management among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Table 6: Summary of One sample Kolmogorov-Smirnov Test analysis showing difference between increase in population and improper waste management among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria.

Variable Description	Test	N	Mean±SD	Sig	Decision
Increase in population and improper waste management	One-sample Kolmogorov Test	200	3.55±0.65	0.00	Reject null hypothesis

Asymptotic significance at 0.05 level 'Lillefors corrected'

One sample Kolmogorov-Smirnov Test was run to determine the difference between increase in population and improper waste management among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria. From table 6 above, the results revealed a strong relationship between increase in population and improper waste management among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria at a P value=0.00 hence, the null hypothesis was rejected.

Discussion of Results

The study presented waste management and the health impact among residents of Ajipowo community Akure metropolis, Ondo state Nigeria. Table 1 showed the demographic characteristics of participants. The result showed that male participants are 100 (60%), female participants are 80 (40%). Participants between the age-range of 51-55 (50%) while participants between the age ranges of 30-35, 36-40, 71-75, 76-80 are 5 (2.5%) respectively. Distribution according to academic qualification showed that participants with SSCE/WAEC and HND/BSC certificates are 50 (25%) respectively while participants with no certificate at all are also 50 (25%). Hypothesis 1, table 2 revealed a strong relationship between ineffective waste disposal method and healthy living at a P value=0.00. In view of this result, the null hypothesis which stated that there is no significant difference between ineffective waste disposal method and healthy living among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria was rejected. To corroborate the findings of this result, Nnamdi and Okporibogha (2019) affirmed that positive behavioural change is germane to living in a clean, healthy and wholesome environment in enhancing a sustainable general wellbeing. Once an environment is free of waste, its impact can easily be felt on the health and virtually all aspects of the resident in such environment. Hypothesis 2, table 3 showed a strong relationship between improper waste management and the prevalence of diseases and infections at a P value=0.00. In view of this result, the null hypothesis which stated that there is no significant difference between improper waste management and the prevalence of diseases and infections among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria was rejected. The finding of this result supports the submission of Randerson (2018) which posited that improper waste management is a major cause for the outbreak of diseases in Rwander. In agreement to the submission of Randerson (2018), Abila and Jantah (2017) revealed that little children from the slum in some parts of East Africa have become scavengers not only because of poverty but because of the very dirty environment that encourage scavenging. On the contrary, Agunwamba (2018) opined that the answer for improper waste management should be

sought from the government, stating that the government is to make waste management system functional.

Furthermore, the result in hypothesis 3, table 4 revealed a strong relationship between dirty environment and the health status at a P value=0.00. In view of this result, the null hypothesis which stated that there is no significant difference between dirty environment and the health status of residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria was rejected. To corroborate the finding if this result, Omowale and Hassan (2019) postulated that a dirty environment will habour all kinds of pests, rodents and other hazardous animals that could post danger to the health status of residents of such environment. In other words, the problem of ineffective and inadequate waste disposal and management is a major challenge to the human environment. The result in hypothesis 4, table 5 also revealed a strong relationship between availability of waste bins and proper waste disposal at a P value=0.00. In view of this result, the null hypothesis which stated that there is no significant difference between availability of waste bins and proper waste disposal among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria was rejected. From the submission of Owojori, Mulaudzi, and Edokpayi (2022), solid wastes have been described to be the unwanted substances or materials discarded after use by the consumer or users that should be trashed in a waste bin. However, the non availability of waste bins by residents in a particular place at any given time makes waste management a difficult task by waste collectors. The result in hypothesis 5, table 6 showed a strong relationship between increase in population and improper waste management at a P value=0.00. In view of this result, the null hypothesis which stated that there is no significant difference between increase in population and improper waste management among residents of Ajipowo community, Akure metropolis, Ondo state, Nigeria was rejected. Garcia and Aguirre (2020) postulated that though population could be a cause for improper waste disposal and management, provision of waste bins and regular enlightenment campaigns could ameliorate the situation.

Conclusion

The findings of this study clearly showed that ineffective waste disposal method, improper waste management, dirty environment, non availability of waste bins and increase in population all have positive strong significance on the health impact of residents of Ajipowo community Akure metropolis, Ondo state Nigeria.

Recommendations

Based on the findings of this study, it is therefore recommended that:

1. The government should enlighten the public on health effect of improper waste disposal and management.
2. The government should provide waste bins and ensure that waste collectors come to collect the waste as at when due thereby generating revenue for the government.

3. Health education should be given its rightful place in the curriculum where hygiene will be properly taught.
4. The policies on monthly environmental sanitation should be revived as it has been observed that many people don't observe it again.
5. Non-governmental Organizations should partner with the government on the issue of waste disposal and management.

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