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EFFECT OF HEALTH EDUCATION INTERVENTION ON PRACTICE OF WASTE MANAGEMENT AMONG RESIDENTS OF KANO STATE, NIGERIA

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Abstract

This study examines the effect of health education intervention on knowledge, and practice of waste management among residents of Kano State, Nigeria. To achieve the purpose, researches question and research hypotheses where identified to guide the study. The knowledge of waste management among residents of Kano State, Nigeria before and after Health Education Intervention and The practice of waste management among residents of Kano State, Nigeria before and after Health Education intervention. Quasi pre-test, post-test experimental design was used as it compares treatment with no treatment. Participants are assigned to either the experimental, or control group, and are measured or tested both before and after the health education intervention. The population of the study comprised of sixteen million, eight hundred and thirty-three, six hundred and eighty (16,833,680) residents of Kano State. A sample size of sixty (60) was selected as sample size for this study. Multi-stage sampling procedures involving stratified sampling, sample random and systematic sampling techniques were used to select one local government, out of forty four (44) existing local government of Kano State and participants for the study. A Descriptive statistic of frequencies and percentages was used to describe the demographic characteristics of the respondents. Mean and standard deviation was used to answer research questions. The null hypotheses were tested using inferential statistics; Paired sample t-test was used to test the hypothesis there is no significant practice of waste management before and after health education intervention. Independent t test was used to test hypothesis there is no significant difference between control and experimental in practice of waste management after health education intervention. Results reveals that the practice of waste management after the intervention among residents of Kano State, Nigeria is effective ($p = 0.002$). The control and experimental group differ in practice of waste management after the health education intervention among residents of Kano State, Nigeria ($p = 0.001$).). Based on the findings the study concluded that. Health education intervention in practice of waste management among residents of Kano State, Nigeria is effective. There was difference between control and experimental group in practice of waste management after the health education intervention among residents of Kano State, Nigeria. The study recommended among others that: Future research should be longitudinal studies to assess the long-term impact of health education on waste management behaviour. l. They should lead by example by organizing monthly sanitation drives and clean-up campaigns. EHOs should monitor and document community compliance and make data-driven recommendations to local authorities for improvement

Keywords: *Effects of Health Education, Knowledge, Practice, Waste Management*

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INTRODUCTION

Waste management refers to the human control of the collection, treatment and disposal of different wastes. It is in other words, the process of collection, transporting, processing, recycling or disposal of

waste materials (Dhana & Raju, 2021). Waste management is also carried out to recover resources from it, that is waste could be transformed to wealth. The management of waste involves considering all the classes of waste with different methods and field of expertise (Rinkesh, 2022). Waste management methods vary widely between areas for many reasons, including type of waste materials, nearby land uses and the area (Musa, 2021)

Waste can either be in a form of solid, liquid, gaseous or radioactive substances. Waste that is generated everyday ends up in open dumpsites or scattered along side roads posing an environmental and health hazard, open burning of the waste is common, realizing toxic air pollutants that cause respiratory and cardio-vascular disease (Adriana & Gragor, 2021). The term waste usually relates to materials produced by human activities and management is generally undertaken to reduce their effect on health, the environment or its aesthetics (Musa, 2021).

Practice of waste management among residents are not uniform among countries (developed and developing nations); regions (urban and rural areas), and residential and industrial sectors can all take different approaches (Davidson & Gary, 2017). Effective waste management involves the practice of '7R' Refuse, Reduce, Reuse, and Repair, Re, purpose, Recycle and 'Recover. Amongst these '7R', the first two ('Refuse' and 'Reduce') relate to the non-creation of waste – by refusing to buy non-essential products and by reducing consumption. The next two ('Reuse' and 'Repair') refer to increasing the usage of the existing product, with or without the substitution of certain parts of product. 'Repurpose' and 'Recycle' involve maximum usage of the materials used in the product, and 'Recover' is the least preferred and least efficient waste management practice involving the recovery of embedded energy in the waste material. For example, burning the waste to produce heat (and electricity from heat), certain non-biodegradable products are also dumped away as Disposal', and this not a "waste'-management "practice (Sankar & Ajith, 2015).

Health Education Intervention is a planned activity that uses communication to improve health literacy and develop life skills. The goal of health education is to promote health behaviour and improve the general health and wellness of a population. The term health education intervention strategy is a heuristic device used to conceptualize and organize a large variety of activities. The ultimate goal of health education intervention is to positively influence health status; more proximal indicators of success are changes in intermediate outcomes or impact. Because health education works through intermediate outcomes, the linkage to health status is often assumed to be at a conceptual or theoretical level (Steckler, Allen, David, Richard, Burdines, Goodman, Robert, Jongensun, & Cynthia, 1995).

STATEMENT OF THE PROBLEM

Poor solid wastes pose threat to public health and Environmental quality of which becomes public health problem. Kano State presently is experiencing system which creates a source of pollution, asthma and other respiratory infection that environment, population health and sustainable development. Major wastes in our society today that need effective management include solid wastes such as papers, plastic materials and many more. Waste management refers to the various schemes to manage and dispose of wastes. It can be discarding, destroying, processing, recycling, reusing, or controlling wastes. The prime objective of waste management is to reduce the amount of unusable materials and to avert potential health and environmental hazards. And also, the collected wastes are disposed of by various methods for example by landfill, compaction and incineration Liquid wastes such as sewage and gaseous wastes like chemical as carbon monoxide exhaust from vehicles and more others. By contrast, improper waste management characterized by open disposal of waste in the environment is associated with unpleasant odour, pollution of water resource that present a serious threat to marine ecosystems Kano State presently is experiencing system which creates a source of pollution that is affecting the environment, population health and sustainable development. Disposing of waste in a landfill, burying in a burrow pit and burning solid wastes into ashes remains common practice among residents in Kano as observed by the researcher.

RESEARCH QUESTIONS

The following research questions were formulated; -

1. What is the practice of waste management among residents of Kano State, Nigeria before and after Health Education intervention

2. What is the difference between control and experimental group in practice of waste management after the health education intervention among residents of Kano State, Nigeria

HYPOTHESES

On the basis of the research questions of the study the following hypotheses were formulated:-

1. There is no significant practice of waste management among residents of Kano State, Nigeria before and after Health Education intervention.
2. There is no significant difference between control and experimental group in practice of waste management after the health education intervention among residents of Kano State, Nigeria.

METHODOLOGY

The research design used for this study is quasi-experimental of pre-test and post -test experimental and control groups research design was used. However, unlike a true experiment, a quasi – experiment does not rely on random assignment And The target population of this study consist of sixteen million, eight hundred and thirty three, six hundred and eighty (16,833,680) this paper is significant to Residents of Kano State,Nigeria according to Nigeria Projected Population census by States, 2024 (National Population Commission, 2024).

Hypothesis I: There is no significant practice of waste management among residents of Kano State, Nigeria before and after Health Education intervention.

This hypothesis was tested with the scores at both pre-test and post-test stages of the experiment. The Paired sample t-test procedure was used for the test because of the need to determine the effect of intervention on the outcome of the experiment. The result of the Paired sample t-test is summarized in the table:

Table: Paired sample t-test on practice of waste management among residents of Kano State

Variable	Test	N	Mean	Std. Dev.	Std. Error	t-value	Df	p-value
Practice of Waste Management	Pre-test	30	1.99	0.547	0.0352			
						5.921	29	0.002
Test Mean	Post-test	30	3.40	0.480	0.0121			

(t-critical = 1.98, p <0.05)

The test result for hypothesis revealed in table; that the observed mean score of 3.40 for practice of waste management among residents of Kano State' post-test was significantly higher than 1.99 which is the pretest mean. The observed t-value for the test (5.921) obtained at 29 degree of freedom (df) is higher than the critical value indicated at the bottom of the table. The p-value for the test was 0.002 ($p < 0.05$). There observations provided sufficient evidence for rejecting the null hypothesis. The null hypothesis that effect of health education intervention programme in practice of waste management among residents of Kano State, Nigeria is not significant is therefore rejected. The result shows that the residents have significant practice of waste management among residents of Kano State after intervention.

Hypothesis II: There is no significant difference between control and experimental group in practice of waste management after the health education intervention among residents of Kano State, Nigeria.

This hypothesis was tested with the scores of the experimental and controls scores at post-test stages of the experiment. The independent t-test procedure was used for the test because of the need to

determine the difference of post-test. The result of the independent t-test is summarized in the table 4.16

Table 4.16: Independent t-test on difference between control and experimental group in practice of waste management after the health education intervention among residents of Kano State, Nigeria.

Variable	Test	N	Mean	Std. Dev.	Mean Diff.	t-value	Df	p-value
Practice of waste management	**Experimental**	30	3.40	0.480	1.51	5.631	58	0.003
	Control	30	1.89	0.502				

(t-critical = 1.96, df=58, p <0.05)

The test result for the hypothesis revealed in table 4.16 that there is significant difference in pre and post-test of experimental and control group. The mean score indicated that in experimental group a mean of 3.40 with standard deviation of 0.480. The mean score indicated that in control group a mean of 1.89 with standard deviation of 0.520. The mean difference between experimental and control group is 1.15 indicated significance. The mean value for control showed that it is below and experimental is above the benchmark mean of 2.50. The analysis further shown that p-value of 0.003 is lower than 0.05 (0.000<0.05) and t-value of 5.631 is greater than 1.96. These observations provided enough evidence for rejecting the null hypothesis. Thus, with this result we can conclude that the null hypothesis: There is no significant difference between control and experimental group on the effect of health education intervention on practice of waste management after the health education intervention programme among residents of Kano State, Nigeria is rejected. It means that there is a significant difference between control and experimental group in practice of waste management after the health education intervention programme among residents of Kano State, Nigeria.

DISCUSSION OF FINDINGS

Hypothesis I: There is no significant practice of waste management among residents of Kano State, Nigeria before and after Health Education intervention.

The findings of this study revealed that there was a significant improvement in the practice of waste management among residents of Kano State after the health education intervention programme. The post-test mean score (3.40) was significantly higher than the pre-test mean score (1.99), while the calculated t-value of 5.921 was greater than the critical value of 1.98 at 29 degree of freedom. The p-value of 0.002 was also less than 0.05 level of significance. This implies that the health education intervention programme had a positive effect on improving waste management practices among the residents.

This finding is consistent with Ogwueleka (2009), who reported that environmental education significantly improves solid waste management practices among urban communities in Nigeria. The study emphasized that awareness creation leads to better household waste handling and disposal behaviour. It also agrees with Azuike (2011), who found that health education interventions significantly improved environmental sanitation practices among households in South-Eastern Nigeria, noting that educated participants demonstrated better compliance with waste disposal guidelines.

Similarly, Nwabueze (2013) reported that community health education significantly enhanced participation in proper waste disposal and environmental hygiene practices among residents in rural

communities. The finding is further supported by Saidu (2015), who observed that environmental health campaigns significantly improved waste management behaviour in Northern Nigeria, especially in areas exposed to continuous sanitation education. Likewise, Egun (2012) found that environmental education programmes improved waste segregation, recycling, and disposal practices among community members exposed to structured health education. However, the finding contradicts Adeolu (2014), who reported that poor waste management practices persist in many Nigerian urban areas despite awareness due to inadequate infrastructure and weak environmental enforcement mechanisms.

Hypothesis II: There is no significant difference between control and experimental group in practice of waste management after the health education intervention among residents of Kano State, Nigeria.

The findings of this study revealed that there was a significant difference between the experimental and control groups in practice of waste management after the health education intervention programme. The experimental group had a higher mean score (3.40) compared with the control group mean score (1.89). The calculated t-value of 5.631 was greater than the critical value of 1.96, while the p-value of 0.003 was less than 0.05 level of significance. This indicates that the intervention had a significant effect in improving waste management practices among the experimental group compared with the control group.

This finding is in agreement with Achor (2010), who reported a significant difference between experimental and control groups exposed to environmental health education, with the experimental group demonstrating better sanitation practices after intervention. It also supports Oloruntoba (2012), who found that structured health education programmes significantly improved environmental hygiene practices among intervention groups compared to non-intervention groups in Southwestern Nigeria. Similarly, Ifegbesan (2010) reported that environmental education interventions significantly influenced positive behavioural change in waste management practices among students and community members exposed to the programme.

The finding is also consistent with Babayemi (2011), who observed significant improvements in waste handling and disposal practices among participants exposed to environmental awareness campaigns compared to those not exposed. Likewise, Omran (2013) found that environmental health education interventions significantly improved household waste management practices in urban communities, especially among trained participants. However, the finding contradicts Guerrero (2013), who argued that waste management behaviour is largely influenced by structural and institutional factors such as availability of waste disposal facilities, rather than educational interventions alone.

CONCLUSION

From the findings of the examination of the effect of health education intervention on practice towards waste management among residents of Kano State, Nigeria, the researcher concludes as follows:

1. Health education intervention in practice of waste management among residents of Kano State, Nigeria is effective.
2. There was difference between control and experimental group in practice of waste management after the health education intervention among residents of Kano State, Nigeria.

RECOMMENDATION

The study has the following recommendations:

1. Researchers: Future research should be longitudinal studies to assess the long-term impact of health education on waste management behaviour. There is a need for comparative studies across rural and urban settings in Kano State to understand contextual challenges and effectiveness of

intervention programmes. Researchers should explore the role of digital tools and media in enhancing waste management practices.

4. Environmental Health Officers (EHOs): EHOs should strengthen community outreach intervention by conducting house-to-house education on hygiene and waste disposal. They should lead by example by organizing monthly sanitation drives and clean-up campaigns**.** EHOs should monitor and document community compliance and make data-driven recommendations to local authorities for improvement

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