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EXPLORING UNIVERSITY UNDERGRADUATE STUDENTS' KNOWLEDGE AND ATTITUDES TOWARDS WASTE MANAGEMENT

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Abstract

Waste generation is inherent in various processes, posing environmental and health challenges. Although Kwara State University administration is committed to maintaining a clean environment, the level of awareness among students remains unclear. This study examines the knowledge and attitudes of university undergraduates toward waste management. Three hundred and thirty-two students participated, with 96% being under 28 years old. Results showed that 66% of respondents are aware of waste management, 51% have not taken courses on the subject, and 65% are unconcerned about waste-related issues, though 78% are aware that improper waste disposal poses a health risk. Seventy-one percent would drop garbage in a car or throw it out of the window, or just dump it in a neighboring bush or drainage. The study concluded that the knowledge of students is at an intermediate level, but their attitude towards waste disposal is still insufficient and recommends integrating relevant topics and practical experiences into the undergraduate curriculum for enhanced awareness and better attitude.

Keywords: waste management, knowledge, attitude, waste education, undergraduate students, Kwara State University.

Introduction

Effective waste management, a key component of environmental sustainability, starts with our knowledge and attitudes, which influence the choices and actions that affect our communities. The Basel Convention defines waste as substances or objects that are discarded, intended to be

discarded, or mandated for disposal under national laws (van Der Marel, 2022). Developing countries have been dealing with indiscriminate dumping of wastes, defined as the illegal disposal of waste in inappropriate locations such as vacant lands, water bodies or other unsuitable areas (Machete and Shale, 2015). Since over two decades ago, Benneh et al. (1993) reported that roughly 83% of Ghanaians engaged in indiscriminate waste disposal due to the limited waste management infrastructure. Similarly, Patil and Ramakrishna (2020) and Lissah et al. (2021) identified ineffective enforcement of waste disposal regulations, poor logistics, budgetary restraints, and negative attitudes toward waste management as contributing factors to inappropriate garbage dumping.

This issue is widespread across both developed and developing nations, posing serious environmental and public health risks. In Nigeria, studies showed that 68.5% of solid wastes are disposed of illegally, while only 20.8% goes to proper landfill sites, and 10.7% is incinerated (Adeniran et al., 2014). In Nairobi, Kaluu (2021) observed that only about 50% of the daily over 3,000 tons of waste generated is collected by local authorities, with the rest left unaccounted for. This pattern reflects the heavy reliance on illegal dumping as a waste disposal method in many developing countries (Niyobuhungiro and Schenck, 2022). Similar trends are found across Africa, with Shi et al., (2021) reporting that although solid waste collection rate was above 80%, a huge percentage is disposed of illegally. Even in rural areas of the developed nations, improper waste disposal remains a challenge (Mihai and Grozavu, 2019).

In Nigeria, rapid urbanization and population growth, particularly after the oil boom of the 1970s, drastically increased waste production. This is more evident in cities like Lagos, Abeokuta, Ota, Kano, Calabar, and Port Harcourt, where various types of solid waste are indiscriminately disposed, leading to serious environmental and public health threats. The unregulated dumping of waste has become a global concern, contributing to pollution, environmental degradation, flooding and disease outbreaks (Ofoezie et al, 2022). In a public establishment like a university, indiscriminate waste disposal could be a growing problem. The widespread use of non-biodegradable materials such as plastic and polythene packaging has worsened waste management challenges on university campuses (Wondimu, 2020). Poorly managed waste near hostels, offices, and classrooms attracts pests and disease vectors, posing serious health risks. The rapid expansion of university populations could exacerbate this issue, as waste generation outpaces proper disposal capacities. There is a paucity of information on the attitudes and knowledge of Kwara State University undergraduates about waste management, with little information available from other higher institutions in Nigeria.

This study examined knowledge, attitudes, and practices of students in higher institution regarding solid waste disposal, as well as their awareness of the health risks linked to poor waste management. This is necessary to properly address several key issues related to waste management within the institution and identify areas where education and awareness are lacking.

It is essential to ascertain whether students are aware of the health hazards linked to improper waste management in order to promote appropriate behaviours that safeguard public and individual health. This study aims to highlight the importance of effective waste management practices and provide insights that can lead to improved policies and programs, ensuring a cleaner and healthier environment for all.

Purpose of the Study:

The purpose of this study was to find out the:

i. knowledge of waste management among undergraduate students
ii. behaviour of the students about waste disposal

Research Questions

Two research questions were raised to guide the study

i. What is the current knowledge level of the undergraduate students about waste management?
ii. What behaviour do the students have when it comes to waste disposal?

Research design

This study employed a descriptive survey research approach, using a structured questionnaire to gather data from the students. The questionnaire was divided into four sections: socio-demographic information, including age, gender, faculty, department, level, and hostel type (on-campus, off-campus, private); knowledge of indiscriminate solid waste disposal; attitudes toward indiscriminate waste disposal; and practices related to waste disposal.

Study area

The study was carried out at Kwara state University, Malete, Nigeria (Figure 1). The student respondents were drawn from the Faculties of Pure and Applied Sciences, Engineering and Technology, Agriculture, Management and Social Sciences, Education, and Law covering all academic levels from 100 to 500.

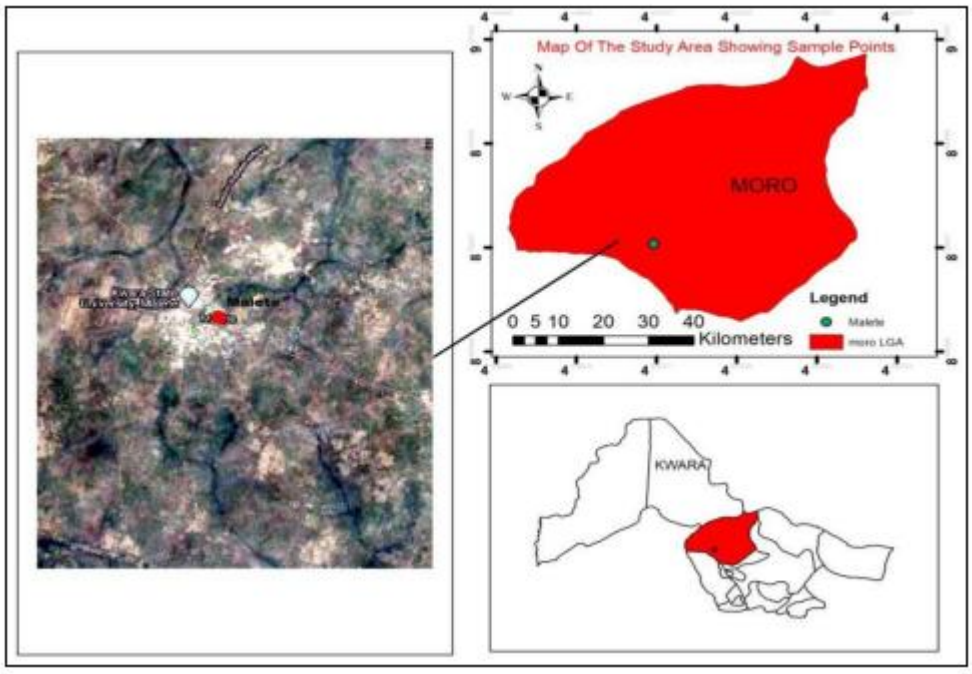


Figure 1: Satellite map of the study area

Procedure for Data Collection

Data were collected via an online questionnaire administered through Google Forms. The survey link was distributed to students via WhatsApp and remained open for four weeks, with periodic reminders. Of the 5,000 students invited, 332 responded, and their responses were automatically saved to a central Google Drive database.

Data analysis

The collected data were analysed using descriptive statistics to summarize demographic characteristics, knowledge, attitudes, and practices related to solid waste disposal. Results were presented in frequencies and percentages to highlight trends across the study variables. The differences in each section between the responses of faculty and academic levels were analysed using Chi Squared analysis, with $p < 0.05$ as the critical value.

Results

Demographic characteristics of the respondents

The data presented in Table 1 shows the detailed demographic profile of the 332 university students who participated in the study.

Table 1: Respondents Profile (n = 332)

Variables	Frequency	Percentage (%)
Gender		
Male	155	46.7
Female	177	53.3
Total	**332**	**100**
Age of Respondents		
Less than 18 years	18	5.4
18-23 years	150	45.2
24-28 years	152	45.8
Above 28 years	12	3.6
Total	**332**	**100**
Faculty of Respondents		
Pure and Applied Sciences	62	18.7
Education	52	15.7
Engineering and Technology	57	17.2
Humanities and Management Sciences	38	11.4
Agriculture and Veterinary Sciences	49	14.8
Law	31	9.2
Information and Communication Technology	43	13.0
Total	**332**	**100**
Academic level		
100	28	8.4
200	59	17.8
300	101	30.4
400	84	25.3
500	60	18.1
Total	**332**	**100**

Characteristics of participants		Yes	No	Sig. Level
	Pure and Applied Sciences	41	21	0.00
	Education	17	35	
	Engineering and Technology	36	21	
Faculty of Respondents	Humanities and Management Sciences	5	33	
	Agriculture and Veterinary Sciences	42	7	
	Law	5	26	
	Information and Communication Technology	15	28	
	100	13	15	0.01
	200	23	36	
Academic level	300	41	60	
	400	36	48	
	500	48	12	

Table 2 shows a comparative analysis of students' awareness and adherence to waste management practices across faculties and academic years.

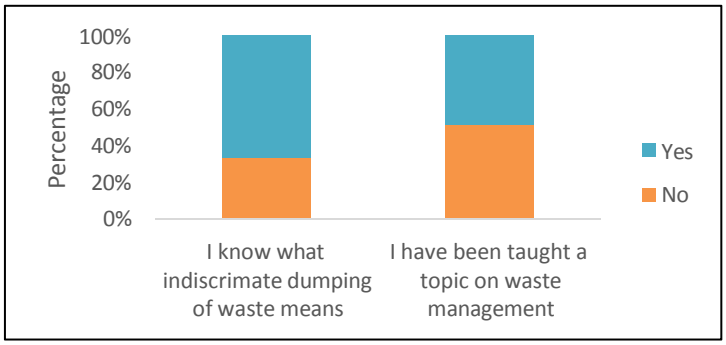


Figure 2: Knowledge and instruction on indiscriminate dumping among students

Figure 2 shows that majority of respondents (66%) reported understanding the concept of indiscriminate solid waste disposal, while nearly half (48.2%) indicated that they had been taught a topic related to waste management during their university studies.

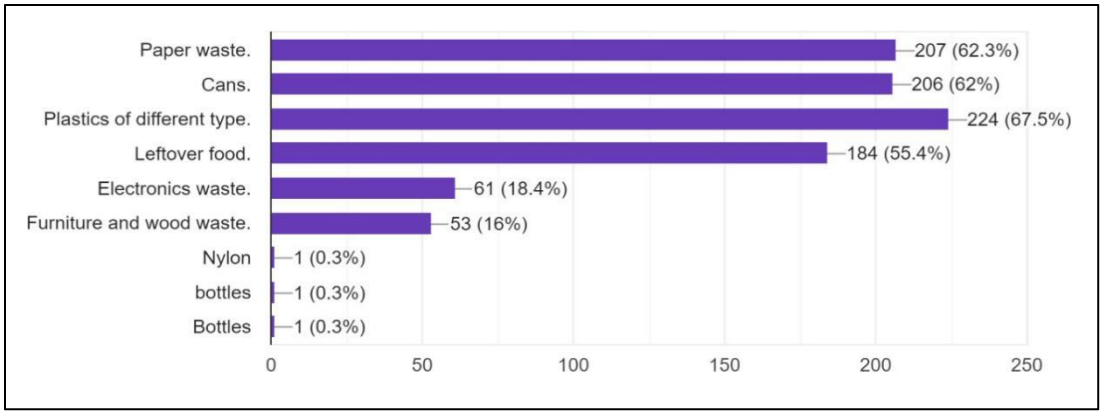


Figure 3: Categories of wastes generated by students

Figure 3 provides a breakdown of the primary types of waste generated by students, contributing to the solid waste problem on campus and in hostels. A significant proportion of respondents (67.5%) reported generating plastic waste of various types, about 62% indicated producing each of paper and can wastes, and 55.4% generated food waste.

Research question 2: What behaviour do the students have when it comes to waste disposal?

In order to answer the question, the disposal methods and management practiced by the respondents analysed. The output of analysis reveals that:

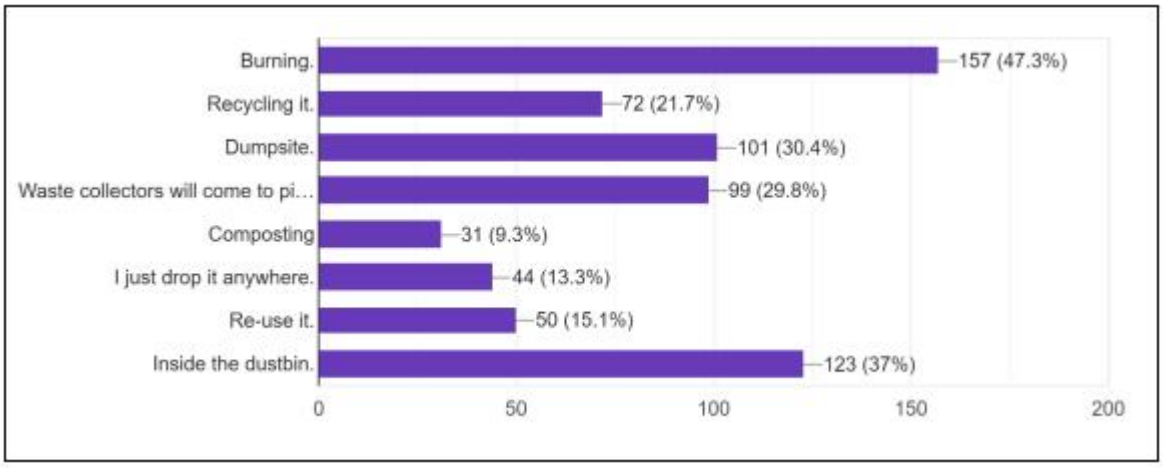


Figure 4: Disposal methods practiced by students

Figure 4 shows that students use various waste disposal methods, with 47.3% engaging in open burning, 37% using designated dustbins, and 30.4% disposing waste at nearby dumpsites. Despite the global push for recycling, only a small percentage (21.7%) of students engage in it.

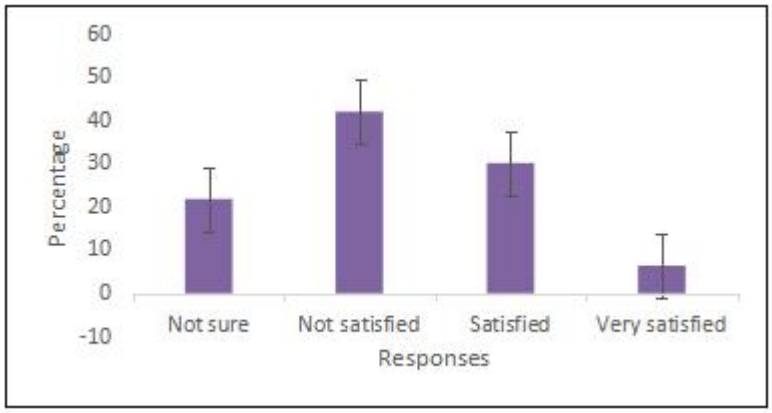


Figure 5: Level of satisfaction of students by waste management methods of the institution

Figure 5 showed that 41.9% of respondents are dissatisfied with waste management in the university, while 36.4% show some satisfaction.

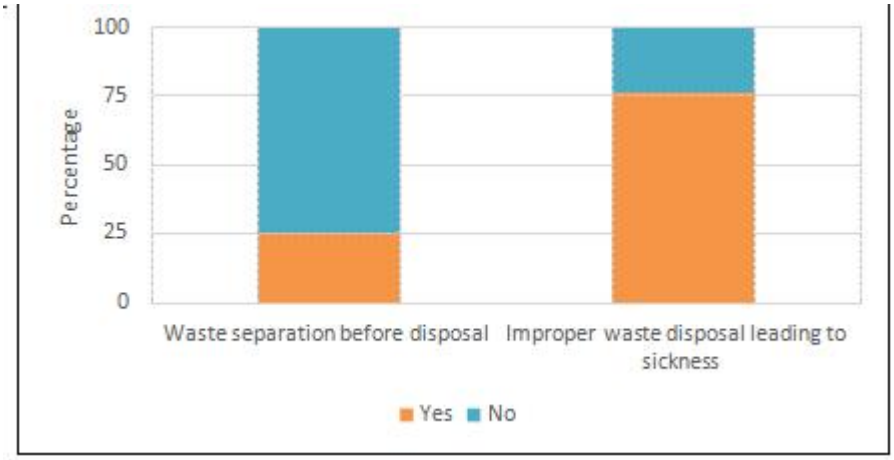


Figure 6: Waste separation practices and their impact on health

Figure 6 shows statistics of students who engage in waste separation and their perceived health impact of indiscriminate waste disposal. A majority (78%) of students acknowledge that improper waste disposal poses significant public health risks, including disease spread and environmental harm. However, only 25.3% of students actively separate waste before disposal.

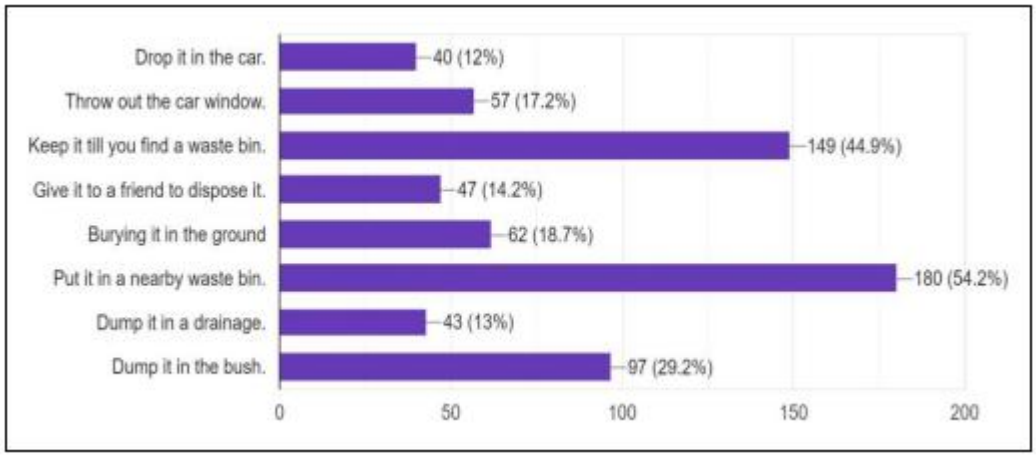


Figure 7: Waste management practices

The specific waste management practices employed by students are shown in Figure 7. A significant percentage of the respondents (54.2%) reported disposing of wastes in a bin, while 44.9% indicated that they hold onto their waste until they find a bin. However, 29.2% admitted to discarding waste in the bush.

Discussion of findings

In terms of age, the majority of respondents fell within the 18 to 28 age range, with almost equal representation between those aged 18-23 and 24-28. This distribution aligns with the typical age range of an undergraduate student population, as noted by Winham et al. (2020).

The results highlight a significant awareness among university students regarding indiscriminate solid waste disposal, as evidenced by the two-thirds who reported familiarity with the concept. However, the less than half of respondents who have received formal education on waste management suggests a gap in the academic curriculum, where more comprehensive coverage of environmental sustainability and waste management topics is needed (Owojori et al., 2022). Students from Faculties of Pure and Applied Sciences and Agriculture show a higher understanding of waste disposal, likely due to the inclusion of the concept of waste in their curriculum (Owojori et al., 2022). Higher-level students also demonstrate greater knowledge compared to lower-level students. Significant p-values (0.00 and 0.01) highlight the influence of faculty and year of study on waste management awareness. These findings suggest that targeted educational interventions, especially in earlier academic years, could enhance sustainable waste management knowledge and practices among undergraduate students.

With more than two-thirds of respondents generating plastic waste, it becomes evident that plastics are a major contributor to the solid waste issue, which aligns with global concerns over plastic pollution (Law et al., 2020). The generation of paper, cans, and leftover food also signifies the diverse nature of waste on university campuses, pointing to the need for differentiated waste management strategies (Vlachokostas et al., 2021). For instance, while plastics and cans could be targeted through recycling programs, leftover food waste presents opportunities for composting or waste-to-energy initiatives.

The results also indicates that students use a range of waste disposal methods, including open burning, use of designated dustbins, and dumping waste at nearby sites. These practices contribute to environmental and health hazards, such as air pollution and contamination of soil and water. Despite worldwide efforts to promote recycling, only a small portion of students actively participate, which may be due to limited awareness and insufficient recycling infrastructure (Bui

et al., 2020). The findings highlight the widespread reliance on improper waste disposal methods and emphasize the need for interventions such as awareness campaigns (Ugwu, 2020). Universities should prioritize improving waste disposal infrastructure and collaborating with waste management authorities to promote sustainable practices. Targeted efforts are necessary to bridge the gap between students' knowledge of proper waste management and their actual behavior (Sewak et al., 2021).

Conclusion

The study concluded that despite the effort of the university management to ensure a green and conducive environment, most students engaged in crude waste dumping in various areas, such as gutters and nearby bushes, although they expressed interest in adopting better practices like using designated waste bins. Their knowledge of waste management was moderate, suggesting that with a little push through education and awareness, their waste disposal habits could improve, helping to maintain environmental cleanliness.

Recommendation

In view of the results obtained from the study, the following recommendations are hereby made.

i. The university management, through appropriate centers, should conduct regular educational campaigns to raise awareness about the dangers of indiscriminate dumping.
ii. Behavioural change through targeted environmental programs should be encouraged.
iii. More waste disposal facilities across the institution should be made available.
iv. Introduction of moderate penalties for non-compliance with waste management rules.
v. Installation of clear signage to guide proper waste disposal methods, promoting a cleaner and healthier university environment.

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