

Assessment Of Higher Education Students' Awareness, Practice and Attitudes Towards Solid Waste Management In Lahore, Pakistan

Mahmoona Ashraf, Marina Manzoor

ABSTRACT

The present research was conducted to study student's attitude, knowledge, and practice towards solid waste management. The main object of the research was to study student's point of view regarding practice, knowledge, attitude and their concern regarding solid waste management. The population of the present study was consisted of students from higher education institutes in Lahore. The study design was cross sectional and analytic study. A sample of 320 students was drawn. The technique of simple random sampling was used for this purpose. Google form questionnaire was used as a tool for data collection. Frequency table were used to represent the findings. Independent t-test used for difference between male and female respondents regarding their level of perception about solid waste management. Based upon findings of the study, it was concluded that the students had positive attitudes toward solid waste management, both male and female students have shown almost similar perspective towards attitude of solid waste management program. It is also concluded that the most of the respondents were aware how to manage the solid waste management and that the students of universities are more efficient towards the practice of solid waste management, mostly student's answer positively.

KEY WORDS: Practice, Attitude, gender, solid waste management, awareness, practice, higher education

1 Introduction And Review Of Literature

The waste management sector is facing many challenges on a global scale. As a result of human activities, large amounts of urban and industrial waste are generated every day around the world. It is estimated that the world produces about 3.4-4 billion tons of municipal and industrial solid waste and up to 300 million tons of hazardous waste per year [15]. As the volume and complexity of solid waste increases, the environmental risks posed by waste products include human health risks, ecosystem degradation, soil and water pollution, as well as greenhouse gas emissions, global warming and climate change (United Nations Environment Program, 2011). These risks are more pronounced in developing countries around the world, where there are more consumers of

industrial materials and a higher proportion of outdated and outdated technical products than in developed countries. This is partly due to the shipment of waste products to developing countries, such as used refrigerators, hazardous industrial waste, second-hand clothes, cars and shoes [5].

Solid waste refers to any waste, waste, sludge and other waste (including solid, semi-solid or gaseous substances) generated by industrial, commercial, operational, and agricultural operations and Community Activities, New York State Department of Environmental Protection (2015). Solid waste at the time of disposal constitutes the following substances: paper bags, polyethylene bags, bottles, agricultural solid waste (tomato skin, cabbage, sugar cane, yam skin, etc.).Waste tires, scrap metal, latex paint, furniture and toys, waste, appliances and vehicles, oil and antifreeze, aerosol cans and compressed

gas cylinders, construction and demolition waste, and asbestos. Thus, solid waste can be defined as non-liquid and non-gaseous waste, waste or sludge products of human activity and is considered useless.[11] In addition, environmental education has been integrated into basic and secondary education as a cross-cutting concept. These efforts by the government of Pakistan do not seem to have produced much desired results, as solid waste can still be seen in urban and rural areas. Review available literature, for example. [2,3]shows that most research on solid waste management is focused on families and communities, with only a small number of Secondary School students participating. As a result, much remains to be done to ensure environmental protection in Pakistan, particularly in the area of Solid Waste Management.

Proper disposal of waste is essential to protecting the environment. Lack of knowledge, unscheduled and unplanned dumping of waste is the main cause of waste mismanagement. Lack of knowledge about waste disposal is a major problem of human health. Waste containers and trash cans are very important for waste disposal needs. Due to the lack of knowledge and the lack of availability of household trash, people face many problems (Kiran et al., 2015). Waste includes all materials produced by human and animal activities and is discarded and useless. Waste disposal refers to the removal and destruction or storage of damaged used or other unwanted materials, including packaging waste (glass, paper or plastic), household, commercial and agricultural. Disposal includes dumping, burial in landfills. People must have knowledge about the disposal of household waste. Awareness of waste disposal is important. Inadequate and inadequate knowledge of the disposal of household waste can have serious health consequences and have significant environmental impacts. If people have a good understanding of living waste

disposal, they can prevent infectious diseases and keep the environment clean [8]. People must be positive about household waste disposal. People's attitudes towards waste disposal are influenced by their level of knowledge. Most people do not use dumpsters due to lack of knowledge. People who lack knowledge about household waste disposal have a negative attitude towards waste disposal in their homes. If people play an important role in waste disposal, they can achieve many health and environmental benefits [1].

It is undisputed that one of the main problems facing large cities in Pakistan that has become a thorny nuisance is the public and indiscriminate dumping of garbage, human and animal manure. In a strategic location in the center of the city, piles of rotting garbage are basically domestic. Waste from these dump sites is clearly a source of air and water pollution, land pollution, health hazards and environmental degradation [16]. Regrettably, this situation is characteristic of the environmental culture of Ibadan. It is important to note that threatened public health conditions can put too much pressure on health budgets, weaken productivity and worsen urban health. This ugly situation has continued for decades due to the high rate of illiteracy, ignorance, uncivilized culture of littering and other factors. With all this in mind, this study aims to assess the knowledge, attitudes and practices of Secondary School students on Waste Management in Pakistan.

In addition, environmental education must change attitudes, norms, values, beliefs and awareness of a friendly environment. As implementers of the future environmental education curriculum, future teachers need to be positive about Solid Waste Management. Attitude refers to the acquisition of a set of values and feelings that care about the environment, as well as the motivation to actively

participate in environmental improvement and protection [13]. Environmental attitudes constitute a good understanding of a set of beliefs, interests or rules that affect environmental action [7]. This assumes that if schools instill positive values and attitudes towards solid waste management in children, they will play an active role in protecting the environment and resources, thereby protecting these values for the next generation.

Environmental education is not explicitly stated in the vision of the Federal Ministry of Education. It is seen as a cross-cutting theme in the national curriculum for primary and secondary schools and the minimum standards of the National Academy of Education. In addition, there is very little research on assessing the level of knowledge and attitude of individuals to disposal, especially the future teachers of Solid Waste Management in Pakistani institutions of higher learning. However, the question is whether the content of the national minimum standards provided to future teachers of the school of education students is fully equipped with their knowledge and correct attitude in order to effectively carry out the teaching and learning of environmental concepts, such as Solid Waste Management. Pakistan's Institute of education is also responsible for shaping students to become responsible members of society. It is important that teachers are at the forefront of building and maintaining a culture of social environmental awareness [2], especially in Solid Waste Management. This agrees with Ibrahim and [6], who emphasize that education should make young people aware of environmental issues. In order to do this in any important way, it is necessary to collect baseline data on the understanding of students while in their teacher training program. In particular, their awareness of environmental issues and their attitude to solid waste management activities are part of their learning process. Therefore,

special knowledge and attitudes gained from environmental education will help to change their behavior towards the environment. This is crucial because teachers are the enforcers of government plans and policies.

Solid waste management is the collection, treatment and disposal of solid materials that have been discarded because they have achieved their purpose or are no longer useful. Improper disposal of solid waste can lead to unsanitary conditions, which in turn can lead to environmental pollution and outbreaks of vector-borne diseases, i.e. rodent and insect-borne diseases. The task of solid waste management presents complex technical challenges. It also brings with it a range of administrative, economic and social issues that must be managed and addressed [9].

Globally, the waste management sector is facing many challenges [4]. Allen and Bassey noted challenges ranging from the lack of a declaration of a national environmental emergency to the need to review and popularize existing laws, regulations and policies. They also stressed the need to encourage public participation in the development and implementation of waste management plans and across the country for all types of waste. In addition, environmental education needs to be integrated into school curricula from the primary level, in particular on recycling, reuse and waste disposal. Finally, eco-funds are strictly monitored and used to repair or restore damaged environments. Strict sanitation and waste management, reforestation and oil spill clean-up.

The importance of teachers' knowledge base in teaching cannot be underestimated. In emphasizing the importance of teachers in the effective implementation of environmental education, it is recommended that teachers must be committed to the teaching of environmental education [17]. In addition to commitment, they also need a

good knowledge base of environmental education. Knowledge is all about the basic understanding of the environment in which various experiences are gained and acquired and their related issues. Knowledge is familiarity with someone or something, which can include facts, information, descriptions, or skills acquired through experience or education [18].

Questions about what environmental literacy is and how its core should be addressed are still far from being answered in a common agreement between scientists and practitioners in the field. [14].reiterated that the study of environmental literacy is relatively new and does not give a generally accepted definition, so the attributes of environmental literacy citizens are still discussed and investigated. However, what has been discussed so far in the literature and in thousands of conferences on “the real world of practicing environmental literacy “is important for us to understand what environmental literacy should be aimed at.

In addition, environmental education must change attitudes, norms, values, beliefs and awareness of a friendly environment. As implementers of the future environmental education curriculum, future teachers need to be positive about Solid Waste Management. Attitude refers to the acquisition of a set of values and feelings that care about the environment, as well as the motivation to actively participate in environmental improvement and protection [13]. Environmental attitudes constitute a good understanding of a set of beliefs, interests or rules that affect environmental action [7]. This assumes that if schools instill positive values and attitudes towards solid waste management in children, they will play an active role in protecting the environment and resources, thereby protecting these values for the next generation.

A study by Ayodeji examined the level of awareness, knowledge and practice of Secondary School students on Waste Management in educational institutions in Nigeria. Using a structured self-management questionnaire, 650 students from six secondary schools were surveyed. The collected data is analyzed in Percentages, Averages, standard deviations, t-Tests, and chi-square statistics. The survey showed that secondary school students from the sample area were aware of the waste problem in their school compound, but waste management practices were poor. Studies have shown that the tendency to waste management practices varies by gender, class and age of students. An important relationship was observed between students ' gender, age and class and their level of awareness, knowledge and practice in waste management [5].

A study conducted a similar cross-sectional study assessed the knowledge, attitudes and practices of 300 high school and high school students in home Waste Management in Trissur, Kerala. Using self-management questionnaires, the results showed that high school students were more aware of the importance of waste management than high school students. There is a lack of awareness of e-waste and its disposal among these two groups. The survey results further showed that students were positive about waste management. In addition, students did not find significant differences in their understanding and practice of waste management at home. The researchers also noted the need to raise awareness of waste management in order to improve waste management practices. Parents should also receive environmental education in parent teaching meetings or community projects [12].

The specific objectives of the study were to investigate the level of students' knowledge towards solid waste

management, find out students' attitudes toward solid waste management. To approach the objectives, the following research questions were investigated and hypotheses tested:

- What is students' awareness level towards impact of solid waste management?
- What are the students' attitudes toward solid waste management?
- There is no significant difference between the attitudes of male and female students toward solid waste management.
- There is no significance difference between male, female students and Practice about Solid Waste Management

2 METHOD

2.1 Research Design

In order to obtain information correctly, this research adopts a descriptive research design which involves describing the behavior of the research variable without Influence it in any way. In addition, this research adopts a survey research design in the quantitative research, in which Researchers conducted a survey to sample the entire population to describe their attitudes, the opinions, behaviors or characteristics of the respondents. In addition, Researchers use questionnaires (mailed questionnaires) to collect quantitative data then perform statistical analysis on the data to test the research question or hypothesis.

The survey is divided into two main types of census and sample survey. In the census the survey shows that researchers can collect data from every member of the population without leaving anyone. In a sample survey, the data collected from part of the population

Summarize the intent of the research results. Most survey research designs are Non-experimental, used to

evaluate the statistical relationship between variables or describe a single variables. Cross-sectional surveys collect data one at a time. Longitudinal surveys collect data from the same target population at different times.

In order to conduct this research, a cross-sectional survey research design was adopted. Cross-sectional studies include observation samples or the entire study population, or Phenomenon at a certain point in time. However, this study is used cross-sectional survey design and employed to assess the awareness, attitude, knowledge, and practices among students of Higher Education Institutes.

2.2 Population And Sample

However, the target population of this study includes the students with higher educational backgrounds of Lahore, Pakistan. Random samples selected from the universities of Lahore, Pakistan. The sample size of 320 was taken. Simple random sampling was applied to sampling. Online survey via Google form was taken as a tool of data collection

2.3 Instruments

A self-report type questionnaire was designed and organized. First section was Background information about the respondents and was divided into sub sections, Age, University/college name, Qualification, Department, Major group of study in the section two, which is solid waste management it was sub divided into few variable indicators. Awareness of Solid waste management program (8 items), Practice about Solid waste management (4 items), Attitude towards Solid waste management (4 items), Environmental impacts of solid waste management (5 items). Different type of scales were used in the study. i.e Thurstone scale, Dichotomous scale, Category scale, and Nominal scale. The analysis used in this research was correlations to find the relationships between variables.

After that, we tested the reliabilities of all the variables to check the internal consistency of the constructs. The population of the study was students with higher education of Lahore, Pakistan. The sample size of 320 was taken. Simple random sampling was applied to sampling. Online survey via Google form was taken as a tool of data collection. The Cronbach's alpha statistics (0.805) showed that the reliability value of instrument's data set was good and reliable questionnaire validated by the experts.

2.4 Data Analysis

SPSS version 15.0 used to analysis for the collected data and to assess the demographic profile of the sample and the internal consistency of the construct.

3 Result

This part deals with the concept and method concerned with summarization and description of the important aspect of the numerical data. This area of study consists of the concentration of the data and the computation of the few numerical quantities that provide information about the center of the data and indicate the spread of the observation.

Table 1. Awareness of solid waste management program

No	Factors	Yes	No
1	Did you ever attend any awareness program conducted by local authority/ university regarding house hold waste management?	157 (49.1%)	163 (50.9%)
2	Do you know the principle of waste minimization?	235 (73.4%)	85 (26.6%)
3	Do you know about segregation of waste?	249 (77.8%)	71 (22.2%)
4	Do you know the effective mechanism for solid waste management?	274 (85.6%)	46 (14.4%)
5	Do you know the complications of improper waste management?	293 (91.6%)	27 (8.4%)
6	Do you know how to	212	108

	dispose the e-waste?	(66.3%)	(33.8%)
7	Do you have environmental topics in your curriculum?	252 (78.8%)	68 (21.3%)
8	Are you aware of the Ecological Solid Waste Management Act?	179 (55.9%)	141 (44.1%)

Table 01 shows that the frequency and percentage of the respondents when different questions were asked from the researcher side about awareness of solid waste management. Out of the 320 respondents 157(49.1%) answered yes and 163(50.9%) were answered no that ever attend any awareness program conducted by local authority/ university regarding house hold waste management. Out of 320 respondents 235(73.4%) and 85(26.6%) were answered no when they asked that Do you know the principle of waste minimization. Out of 320 respondents 249(77.8%) answered in yes and 71(22.2%) answered in no while they were asked that Do you know about segregation of waste? Out of 320 respondents 274(85.6%) answered in yes and 46(14.4%) were answered no while asked a question that Do you know the effective mechanism for solid waste management? Out of 320 respondents 293(91.6%) answered yes and 27(8.4%) were answered no when they were asked that Do you know the complications of improper waste management? Out of 320 respondents 212(66.3%) were answered yes and 108(33.8%) were answered no when they asked that Do you know how to dispose the e-waste? Out of 320 respondents 252(78.8%) were answered yes and 68(21.3%) were answered no while they were asked that Do you have environmental topics in your curriculum? Out of 320 respondents 179(55.9%) were answered yes and 141(41.1%) were answered no when they asked that Are you aware of the Ecological Solid Waste Management Act.

Table 2. Practice about Solid Waste Management

No	Factors
----	---------

1	Are you committed to minimize the waste?	292 (91.3%)	28 (8.8%)
2	Do you segregate house hold wastes?	240 (75.0%)	80 (25.0%)
3	Do you use kitchen waste as compost?	146 (45.6%)	174 (54.4%)
4	Do you throw your household waste outside your home?	225 (69.1%)	105 (30.9%)

Table 02 shows that the frequency and percentage of the respondents when different questions were asked from the researcher side about practice of solid waste management. Out of 320 respondents 292(91.3%) were agreed and 28(8.8%) were disagree that they are committed to minimize the waste. Out of 320 respondents 240 (75%) were agreed and 80(25%) were disagreed that they segregate house hold waste. Out of 320 respondents 146(45.6%) were agreed and 174(54.4%) were disagree that they use kitchen waste as compost. Out of 320 respondents 125(39.1%) were agreed and 195 (60.9%) were disagree that they throw their household waste outside you home.

According to the responses from above table shows that the students of universities are more efficient towards the practice of solid waste management, mostly students answer positively.

Table 3. Attitude towards solid waste management

No	Factors	Yes	No
1	Improper waste disposal is a threat to environment?	311 (97.2%)	9 (2.8%)
2	Household waste disposal is the sole responsibility of the local authorities?	256 (80.0%)	64 (20.0%)
3	I am also responsible for the generation of house hold waste?	270 (84.4%)	50 (15.6%)
4	I also have a role to minimize the house hold waste?	294 (91.9%)	26 (8.1%)

Table 03 that shows the frequency and percentage of the respondents when different questions were asked from the researcher side about Attitude towards solid waste management. Out of 320 respondents 311(97.2%) were agree and 9(2.8%) were disagree that improper waste disposal is a threat to environment. Out of 320 respondents 256(80%) were agree and 64(20%) were disagree that Household waste disposal is the sole responsibility of the local authorities. Out of 320 respondents 270(84.4%) agree

and 28(8.8%) were disagree that they are responsible for the generation of household waste. Out of 320 respondents 240 (75.0%) were agreed and 80(25.0%) were disagreed that they have a role to minimize the house hold waste.

Above tables shows that the attitude of students towards solid waste management is positive.

Table 4. T-test analysis of the attitudes mean scores of male and female students toward solid waste management

Factors	Gender	N	M	S.D	t-	Sig.
Attitude towards Solid Waste Management	Female	217	87.8341	13.85808	.544	.556
	Male	103	88.7379	13.91005		

Tbale 04 shows that an independent sample t-test was applied to find the gender based mean difference in the Attitude towards Solid Waste Management. The results revealed that gender does not significantly affect in viewpoint towards Awareness of solid waste management program, as $t = .232, p = .240$ is > 0.05 . It is concluded that both male and female students have shown almost similar

perspective towards attitude of solid waste management

Table 5. T-test analysis of the practice mean scores of male and female students toward solid waste management

Factors	Gender	N	M	S.D	t-	Sig.
Practice about Solid Waste Management	Female	217	87.8341	13.85808	.544	.556
	Male	103	88.7379	13.91005		

Table 05 shows that an independent sample t-test was applied to find the gender based mean difference in the practice about Solid Waste Management The results revealed that gender does not significantly affect in viewpoint towards practice of solid waste management program, as $t = .544, p = .556$ is > 0.05 . It is concluded that both male and female students have shown almost similar

perspective towards practice solid waste management program.

4 Conclusion And Discussion

Based upon findings of the study, it was concluded that the student of higher education institutes of Lahore Pakistan had positive attitudes toward solid waste management. It is concluded that both male and female students have shown almost similar perspective towards attitude of solid waste management program. And there is no significant difference between male and female perspective about attitude towards solid waste management. It was further concluded that that both male and female students have shown almost similar perspective towards practice solid waste management program.

It is also concluded that the most of the respondents were aware how to manage the solid waste management and that the students of universities are more efficient towards the practice of solid waste management, mostly student's answer positively.

Another important goal of this piece of research was to assess the student's knowledge of the health risk of improper waste management. There is ample evidence that if the students have immense knowledge of the harmful effect of poor waste management in general, they have a very little knowledge of the implication of waste in environmental contamination and transmission. It should be also noted that most respondents are aware that improper management of waste leads to cholera, typhoid, and malaria. The poor knowledge level of the respondents was strongly and independently influenced by income, education, and sex, indicating that more effort is needed to adopt community action programs on waste management and health promotion. So there is highly need to give awareness to students and community about solid waste

management act and practice about solid waste management.

The findings of this study have identified gaps in the areas of knowledge as regard the knowledge level and attitudes of students, particularly prospective teachers, with regard to solid waste management. It was noted that these are areas that appear from the existing literature not to have received adequate emphasis in Environmental Education research. This is significant because of the position of prospective teachers who are the potential implementers of the Environmental Education curriculum.

Acknowledgment

Authors would like to thanks Ms Tayyba Muhammad Akram for her support during research work.

REFERENCES

- [1]Adogu P, Uwakwe, K, Egenti N, Okwuoha A and Nkwocha I (2015) Assessment of waste management practices among residents of Owerri Municipal Imo State Nigeria. *Journal of Environmental Protection* 6(05): 446.
- [2]Akinbote, O. (2007). Some Nigerian primary school pupils' knowledge, attitude and practices on water pollution. *The Social Science*, 2(1), 283-286
- [3]Akoni, J. (2007). *Municipal Solid Waste Management in Abuja. Abuja, Nigeria: Abuja Environmental Protection Board*
- [4]Allen, F., & Bassey, N. (2012). Making Policies Work: Between Environmental Policies and Environmental Protection. Nigeria: Oilwatch.
- [5]Ayodeji, I. (2010). Exploring secondary school students' understanding and practices of waste management in Ogun State, Nigeria. *International Journal of Environmental and Science Education*, 5(2), 201-215.

- [6] Babayemi, O.F. & Ibrahim, F.M., (2010). Knowledge and attitude of a group of Nigerian undergraduates towards environmentalism. *Global Journal of Environmental Research*, 4(1), 47-53.
- [7] Ballarityne, R., Connell, S., & Fien, J. (2006). Students as catalysis of environmental change: A framework for researching intergenerational influence through environmental education. *Environment Education Research*, 12(3-4), 413-427.
- [8] Jatau, A.A., (2013) Knowledge, attitudes and practices associated with waste management in Jos South Metropolis. *Plateau State Mediterranean Journal of Social Sciences* 4(5): 119.
- [9] Jerry, A.N., (2015). Solid Waste Management. New York: Encyclopedia Britannica, Inc.
- [10] Kiran K, Kini S, Santhosh N, Kiran NU (2015) KAP study of solid waste disposal of households in Kuttar & Manjanadi Panchayath covered under gramaskhema programme of KS Hegde Medical Academy. *Nitte University Journal of Health Science*. 5(3).
- [11] Leton, T.G., & Omotosho, O. (2004). Landfill operations in the Niger Delta region of Nigeria. *Engineering Geology*, 73(1-2), 171-177
- [12] Licy, C. D., Vivek, R., Saritha, K., Anies, T. K., & Josphina, C. T. (2013). Awareness, attitude, and practice of school students towards household waste management. *Journal of Environment*, 2(6), 147-150.
- [13] Momoh, J.J., & Oladebeye, D.H. (2010). Assessment of awareness of attitude and willingness of people to participate in household solid waste recycling programme in Abo-Eketi, Nigeria. *Journal of Applied Science in Environmental Sanitation*, 14, 1-12.
- [14] Morrone, M., Mancl, K. & Carr, K. (2001) Development of a metric to test group differences in ecological knowledge as one component of environmental literacy, *The Journal of Environmental Education*, 32 (4), 33-42
- [15] Nabegu, A.B. (2010). An analysis of municipal solid waste in Kano Metropolis, Nigeria. *Journal of Human Ecology*, 31(2), 11-119
- [16] Omoleke II (2004). Management of Environmental Pollution in Ibadan, An African City: The Challenges of Health Hazard Facing Government and The People. *J. Hum. Ecol.* 15(4): 265-275.
- [17] Robotom, I., Malone, K., & Walker, R. (2000). *Case Studies in Environmental Education: Policy and Practice*. Geelong: Deakin University Press.
- [18] Schratz, M. (2016). Austria: Overcoming a bureaucratic heritage as a trigger for research on leadership in Austria. In: Anlesing, H., Day, C., & Johansson, O., editors. *A Decade of Research on School Principals: Cases from 24 Countries*. Dordrecht, Netherlands: Springer. pp. 307- 329