SHORT ARTICLE

Knowledge, attitude, practice, and generation of electronic waste (e-waste) among students of health sciences in a private college in Pune

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Citation

Kshtriya PS, Raghupathy A. Knowledge, attitude, practice, and generation of electronic waste (e-waste) among students of health sciences in a private college in Pune: A cross-sectional study. Indian J Comm Health. 2023;35(3):348-353. https://doi.org/10.47203/IJCH.2023.v35i03.018

Source of Funding: Nil **Conflict of Interest:** None declared

Article Cycle

Received: 16/04/2023; **Revision:** 20/08/2023; **Accepted:** 10/09/2023; **Published:** 30/09/2023

Abstract

Background: In "the era of information," e-waste is a major threat to solid waste management and public health. E-waste contains dangerous and destructive compounds that may affect the environment and human health if not properly handled. The objective of the study was to assess the knowledge, attitude, practice on e-waste and to determine e-waste generation rates for two electronic products: computers and cell (mobile) phones among health science students of the Symbiosis Institute of Health Sciences, Pune. **Methodology:** A web-based and institution-based cross-sectional study of students pursuing different health science courses was conducted. Out of 680 students, 405 were randomly selected, dispersed in six strata, and the Google questionnaire was disseminated using a proportionate probability to size ratio, with 188 participants responding at a 46.41% response rate. **Results:** Out of 188 respondents, 95 (50.6%) and 77 (41.2%) study subjects knew about the health and environmental risks associated with e-waste. Physical damage caused 126 (67%) of the research participants to replace their electronics. 67% would learn about e-waste management if it were on the course. 66% purchase 1-3 electronics devices every year, while 23% purchase 4-6. Overall e-waste generation rates among the participants were 0.223 units/capita/year for computers and 0.42 units/capita/year for mobile phones. **Conclusion:** This research reveals a lack of understanding and behaviours related to e-waste among students of health sciences, highlighting the need for health education on e-waste for public health and awareness on safe e-waste disposal, both of which are critical for a risk-free future.

Keywords

Knowledge; Health Sciences students; Awareness; Electronic Waste; Generation.

Introduction

Due to lifestyle changes, industrialisation, and technological advancements in the electronics and information communications technology (ICT) industries, a new yet dangerous waste stream dubbed electronic-waste (E-waste) has emerged.(1–7) E-waste is one of the fastest-growing waste streams, environmental issue, and public health issue.(8–12) E-waste is old, end-of-life electronics discarded by their owners.(13) They are mostly damaged, excess, outdated, and abandoned electronics.(14) E-waste is electrical and electronic equipment (EEE) from manufacturer to maintenance that are discarded.(15) E-waste generates are 50 million tonnes annually.(2,4) Global E-waste increase is 3-5% every year.(16)

India is the second-largest mobile phone producer and fifth-largest e-waste generator.(13,17) India generates two million tonnes (MT) / year of e-waste.(13) India generates 4% of e-waste.(17) E-waste contains over 1,000 hazardous and non-hazardous compounds in a complex structure.(16,18) E-waste contains toxic substances, metals, xenobiotics, and persistent organic pollutants.(19) E-waste contributes 70% of all harmful and hazardous substances to the environment.(20) Several authors have discussed the harmful methods of treating e-waste in

India, such as open burning, dismantling, removal of copper yoke, open landfills, crushing, acid leaching, incineration, and others, which can cause air, water, land, and air pollution and release toxic and carcinogenic chemicals.(5,7,11,16,18) Toxic elements of e-waste may induce renal toxicity, muscle tumours, chronic brain damage, Itai-Itai syndrome, cancer, asthmatic bronchitis, and DNA damage. (5,7,11,16,18)

Any successful e-waste management programme, project, or plan needs positive perception, appropriate practice, knowledge, proper discarding behaviour of end use customers.(3,21) Proper knowledge, attitude & practice (KAP) helps consumers properly dispose of e-waste by requiring them to deliver their waste from electrical and electronic equipment (WEEE) to authorised collection centres or manufacturer pick-up or take-back services.(3,9) Even after WEEE legislation implementation, researchers seldom explore KAP for e-waste among under-graduates (UG) and post-graduates (PG) students in India.(12,14) Customers will eventually become WEEE producers in a community, therefore understanding their WEEE awareness and expertise is important.(12) E-waste research has ignored KAP for years.(12) E-waste is attracting research researchers and momentum, with many study groups submitting publications to journals.(12) Health sciences students have access to a variety of EEE to research cutting-edge medical and paramedical breakthroughs, appropriateness, personal usage, and regeneration. Health sciences students are responsible members of society and should be aware of the formation and production of e-waste, its management and avoidance, its harmful effects, and how to use it in their professional and personal practises. The following will help them care for themselves and become responsible citizens. Health science students are also responsible global citizens; therefore, they can help control e-waste by buying energy-efficient, upgradable, and non-toxic ICT equipment. However, this requires the necessary understanding, attitude, and practice.

Obsolescence of e-wastes can be categorized as: 1) Natural obsolescence, 2) Planned obsolescence.(22) Natural obsolescence refers to the phenomenon of an electronic device being disposed of at the conclusion of its functional lifespan.(22) The practice of disposing electronic devices at the individual level typically involves the utilization of natural obsolescence.(22) Planned obsolescence refers to the deliberate strategy of rendering electronic devices such as computers, printers, and the like, obsolete after a predetermined period of time, typically ranging from 2 to 5 years, which is considered as their designated useful lifespan.(22) Planned obsolescence refers to the practice of disposing electronic devices after a predetermined period, irrespective of whether the device has exhausted its functional utility or not.(22) The aforementioned phenomenon results in the production of substantial quantities of electronic waste, a portion of which can be retrieved, processed, or reclaimed before ultimate disposal. (22)

Aims & Objectives

To assess knowledge, attitude, practice (KAP) of e-waste among public health, hospital & healthcare management, radiology, nutrition & dietetics, and medical technology students. The secondary objective of the study was to ascertain e- waste production or generation rate (natural obsolescence rates) of 2 electronic products' such as smart phone or tablet & PC or laptops by the students.

Material & Methods

An institution-wide, web-based, cross-sectional study was conducted among the students enrolled in public health, hospital & healthcare management, radiology, nutrition & dietetics, and medical technology streams of the Symbiosis Institute of Health Sciences, Pune. The study was conducted for a period of 4 months, from December 2021 to March 2022. The study sample consisted of post-graduate 1st and 2nd year MBA Hospital & Healthcare Management (HHM) students, Master of Public Health (MPH) 1st and 2nd year students, MSc in Nutrition & Dietetics (ND) 1st and 2nd year students, MSc in Medical Technology (MT) 1st and 2nd year students, and Under-graduate (UG) BSc in Medical Technology 1st, 2nd, and 3rd year students, as well as B.Sc. in Radiotherapy (RT) 1st, 2nd, and 3rd year students**.** Students who have voluntarily participated, provided informed consent, and enrolled in the years 2020 and 2021 for PG programs and 2019 and 2020 and 2021 for UG programs were included in the study. Participants who have not agreed to participate in the study. Alumnus, detained students who have enrolled in the year before 2019, diploma & PHD students were excluded from the study. Absolute precision of 5%, 5% alpha error or random error, 95 % CI was used to calculate expected sample size of 385 using samp-size calculator http://sampsize.sourceforge.net/iface/index.html#prev. Total 405 students were randomly sent the questionnaire out of which 188 responded to the survey with a response rate of 46.41%. The authors tried to reach the expected sample size of 385 by repeatedly sending reminders to the participants to fill out the questionnaire, so this proves that the authors have made attempts to reach the expected sample size. Stratified random sampling – 6 groups or strata were created 1) Post-graduate MBA in hospital & healthcare management 2) Post-graduate MSc in medical technology 3) Post graduate masters of public health 4) Post graduate MSc in nutrition & dietetics 5) Under-graduate BSc in radiotherapy 6) Under-graduate BSc in medical technology. From each group, samples were selected by simple random sampling & the samples was probability proportional to size. The survey questionnaire was converted as Google form. The Google form was circulated through institute provided official e-

mail ID and asked to fill the self-reported questionnaire. The data is processed form the Google sheet and made ready for analysis. List of the participant's institute provided mail ID was collected after taking permission of all head of departments of the respective department from the assistant coordinator of the respective branch. Participants information sheet was provided & informed consent form was also electronically signed by the participants. A structured questionnaire (42 items) containing 5 sections out of which 1st section was of demographic details & other 4 sections were of Yes or No questions, open ended question, close ended, multiple-choice questions was developed based on from the following studies(2–6,8–10,12,14,15,21–24) Section: 2 - The knowledge regarding E-waste, Section: 3 - The Attitude regarding E-waste, Section: 4 - The Practice regarding E-waste. Section:5 E - waste generation. Ethical clearance was obtained from the institutional Ethics Committee, Symbiosis International University (reference No: SIU / IEC / 340) before the conduct of the study. Descriptive analysis was done using IBM SPSS version 23 to compute demographic details and finding of survey. The data is presented as measures of frequency, percentage and absolute number for categorical variables. For determining e-waste generation rate by students, the methodology adopted by Jena S et al.,(22) is used & it is described in detail in supplementary files.

Results

405 students were randomly emailed the google questionnaire, and 188 (46.41%) answered. 93 students (49.47%) were between 22–26 years old and 78.7% were female. Most students were from MBA in Hospital and Healthcare Management and MSc in Nutrition & Dietetics programmes. 76% of responders were post-grads, compared to 24% of undergrads. (Table 1)

Knowledge regarding e-waste: Indian electronic waste management rules were unknown to 81% of students. When asked in detail about any hazardous substances in e-waste, 99 (52.7%) respondents gave multiple answers, including 26.59% lead, 24.86% mercury, 10.98% cadmium, 9.83% arsenic, and 0.58 to 3.47% answered hazardous substances like hexavalent chromium and flame retardants, aluminium, barium, beryllium, chromium, cobalt, copper, ferrous, gallium, hydrocarbons, lithium, and nickel. (Table 2) 95 (50.6%) respondents who knew of any serious health risk or occupational hazard linked with e-waste gave numerous responses, which are included in Table 3. 77 (41.2%) respondents who recognized the repercussions of improper disposal of their unwanted electrical and electronic equipment gave numerous responses, as shown in Table 3. When asked about the nature of e-waste, 127 (67.6%) subjects recognized it as toxic, while 21 (11.1%) thought it was nontoxic. About 47 (25%) subjects don't know about the nature of E waste. More than 40% of the participants said the usual life span of a laptop or iPad is 4–6 years, while 41.5% said a refrigerator lasts 10–14 years.

Attitude regarding e-waste: One hundred seventy-two (91.5%) people knew of India's e-waste disposal issue, and 175 (93.1%) said an awareness campaign and collection were needed. (Table no. 4) 35.6% were willing to pay more for e-waste disposal, whereas 19.1% and 45.2% are not. 75% believe college and university e-waste awareness programs improve management, while 25% believe they don't. (Table no. 2) When asked why they bought a new item or replacement, most said physical damage 126 (67%), non-working old equipment 122 (64.9%), higher functionality 59.6%, and new technology 45.7%. Most of the subjects, i.e., 156 subjects (83%), think that government agencies, producers, and consumers are responsible for proper disposal of E waste. The remaining subjects held producers (8%), government agencies (5.9%), and consumers (3.2%) independently answerable for the management. Max. 79.3% believe that e-waste is a problem for youngsters, while 20.7% strongly disagree. E-waste improper disposal was mainly due to a lack of knowledge at 144 (76.6%) and collection stations at 83 (44.1%). (Table 4)

Practice regarding e-waste: The survey respondents gave different responses about how they dispose of e-waste. 117 (62.2%) were traded, 97 (51.6%) were given to scrap merchants, and 90 (479.9%) were retained at home. (Table no. 4) Most of the people in the study, 155 (82.4%), only replaced their electronics when they needed to. 33 (17.6%) of the students replaced their electronics once every 2 years. In this research, 61.7% said they bought a new phone after using it for more than two years; 18.6% said they bought a new phone every two years; and 3.7% said they bought a new phone every six months. Out of 188 respondents, the majority purchased approximately 1-3 electronic products in a year, while the remaining respondents (nearly 23% each) purchased approximately 4-6, 6% purchased approximately 7-9, and only 4.3% purchased approximately 10 electronic products in a year. Mobile devices made up the bulk of the research participants' usage of electronic products, with 184 (97.9%), followed by computers and laptops (181 (96.3%), and earphones (169 (89.9%). The least-used devices by research participants were the MP3 player and Radio 39 (20.7% each).

E-waste generation by students: Most computer owners on campus were first-time owners, with 92 (48.1%) using their first computer and a large number using their second computer, 75 (39.9%). Overall, 35.1% of the old computers were still in use, while 41.5% have been sold or given to others, 20.7% were kept in storage, and 12.8% were sent for repair. Most mobile phone owners on campus were third-time owners, with 65 (34.6%) using their third mobile phones and a large number using their second computer, at 62 (33%). Overall, only 10.1% of the old mobile phones were still in use, while 66.5% have been

sold or given to others, 32.4% were kept in storage, and 6.4% were sent for repair. Responses regarding the ownership of computers and mobile phones showed that students have owned computers for an average (standard deviation) of 5.7 (3.90) years and mobile phones for an average (standard deviation) of 6.8 (2.95) years. Based on the results of the survey, e-waste generation rates were calculated for computers and mobile phones. Computer waste generation rate was 0.223 units per student year, and the average life of a student's computer was 4.46 years. Mobile phones waste generation rate was 0.42 units per student year, and the average life of a student's mobile phone was 2.39 years.

Discussion

S A, Patil et al.,(3) Tikam M V.,(9) and Subhaprada C et al.,(23) reported that more than 80% of students with varying educational backgrounds were aware of any substantial health risk/s or occupational hazard related with e-waste, which is much higher than in our research. Subhaprada C et al.,(23) in their work among the medical students & Katti A et al.,(8) in their work among nursing students reported that more than 80% of the participants had knowledge about the environmental hazards pertaining to the e – wastes. S A, Patil et al.,(3) reported that more than 95% of study respondents were aware & this findings are significantly high as compared to our study. S A, Patil et al.,(3) Subhaprada CS et al.,(23) and V. Raval R et al.,(24) observed awareness of e-waste management rules ranging from 4.53 to 13.2%, which is extremely low and even lower than what we found in our study. In S A, Patil et al.,(3) lack of knowledge (82.92%) and non-availability of collection locations (44.25%) were cited as causes for incorrect e-waste disposal; similar findings were reported in our study. In our survey, the top three practises for unneeded devices were exchanging with dealers/shop people, giving to scrap dealers, and keeping at home. Unfortunately, only 16.5% of participants gave to E-waste collector/licensed recycler. In 2020, S A, Patil et al.,(3) did a cross-sectional survey of 295 MBBS students in Dharwad and found that 39.01% swapped with dealer/shop person, 24.08% given to scrap dealers, and 21.02% retained at home. In Vibhute N et al.,(2) students' top three current practises for underutilised gadgets were 36.17% provided to personal contact, 21.27% swapped, and 21.02% maintained at home. Another research by Tikam M V(9), 61.56% gave to family, 45.36% sold in illegal market, and 24.84% threw it away. In this survey, 66% purchased 1-3 electronics devices a year, 23% bought 4-6, 6% bought 7-9, and 4.3% bought 10 or more. According to Maiya U et al.,(4) 68% of respondents purchased 1-3 electronics devices in a year, 19% bought 4-6, 6% bought 7-9, and 7% bought 10 or more. E-waste generation rates in IIT Kharagpur were 0.18 units/capita/year for computers and 0.46 units/capita/year for mobile phones.(22) Computers were being replaced within 4.8 to 6.5 years, while cell phones were replaced within 1.6 to 3 years(22) which is quite similar as compared to findings of our study.

Conclusion

Students' knowledge was lacking in environmental danger, law and regulations, e-waste collection centers, and health risks. Most subjects replace electronics but dispose of them poorly. The report suggests numerous educational solutions. Incorporating e-waste into health sciences curricula and letting students participate in health education camps will provide them with the information, attitude, and abilities to properly handle e-waste and safeguard the community. Producing eco-friendly electronics, collecting e-waste, reusing or recycling components, safely disposing of it, and increasing awareness of e-waste's environmental impact are key to the success of an e-waste management program.

Recommendation

Future research should concentrate on filling out forms personally, which may yield more trustworthy and valid data. To get qualitative information, a focused group interview might be undertaken. A study might be undertaken to determine the factors impacting KAP in terms of e-waste and its creation. Consider expanding the study to other Indian institutes so that the results may be generalized.

Limitation of the study

The web-based survey has a relatively low response rate, making it ineffective for reaching all of the pupils. Numerous students fail to provide their responses online and frequently forget to update their data. The variables impacting the lack of understanding, attitude, and practice of e-waste among health sciences students were not included in the study. Because the current study was confined to a single institute and used a self-reported cross-sectional survey, it was challenging to generalize the results. Like in many earlier student surveys, females and post-graduate students made up the majority of our sample. We omitted asking about the respondent's religion, family type (nuclear vs. joint), and family income. Only the natural obsolescence of electronic items is relevant to the generation rates mentioned in this research. E-waste production rates will be far greater than those predicted in this research if planned obsolescence is implemented

Relevance of the study

This was the first descriptive cross-sectional study from India that attempted to assess knowledge, attitude, practice & generation of e-waste among public health, Hospital & healthcare management, Radiology, Nutrition & Dietetics, Medical technology students.

References

1. Saoji A. E-Waste Management: An Emerging Environmental and Health Issue in India. National Journal of Medical Research [Internet]. 2012;2(1):107–10.
2. Vibhute NA, Belgaumi U, Kadashetti V, Bommanavar S, Kamate W. Effect of intervention on knowledge of E- waste management amongst dental students: An institution based study. Al Ameen J Med Sci [Internet]. 2021;14(2):137–41.
3. S A, Patil P. Knowledge, attitude, and practice of e-waste among medical students, Dharwad. Int J Med Sci Public Health. 2020;(0):1.
4. Maiya U. Youth Perception Towards E-Waste: A Study with Reference to Udupi District. Asia Pacific Journal of Research. 2020;1(107):43–8.
5. Kumar Tyagi A, Tyagi DrS, Sharma DrL, Dr. Meenakshi. A Study of E-Waste Management on the subject of Awareness of college Students. In: Recent trends in Instrumentation and Electronics. Delhi: Recent trends in Instrumentation and Electronics; 2015.
6. Ravindra K, Mor S. E-waste generation and management practices in Chandigarh, India and economic evaluation for sustainable recycling. J Clean Prod. 2019;221.
7. Mundada MN, Kumar S, Shekdar A V. E-waste: A new challenge for waste management in India. International Journal of Environmental Studies. 2004;61(3).
8. Katti A, Shinde MB, Patil NV. Nursing students knowledge, attitude, and practice towards E-Waste management. Vol. 7, Journal of Critical Reviews. 2020.
9. Tikam M V. E-waste management: role of Indian higher educational institutes. International Journal of Intercultural Information Management. 2014;4(2/3):105.
10. Sivathanu B. User's Perspective: Knowledge and Attitude towards E-Waste. International Journal of Applied Environmental Sciences [Internet]. 2016;11(2):413–23. Available from: http://www.ripublication.com/
11. Monika, Kishore J. E-waste management: As a challenge to public health in India. Indian Journal of Community Medicine. 2010;35(3).
12. Borthakur A, Govind M. Emerging trends in consumers' E-waste disposal behaviour and awareness: A worldwide overview with special focus on India. Resources, Conservation and Recycling. 2017;117(16):102-113.
13. Pinto VN. E-waste hazard: The impending challenge. Vol. 12, Indian Journal of Occupational and Environmental Medicine. 2008.
14. Ranjani DrCV. E-Waste Management Education - A Study Among Students of Osmania University. Journal of Emerging Technologies and Innovative Research (JETIR) [Internet]. 2021;8(2):12–24.
15. Shah A. An Assessment of Public Awareness Regarding E-Waste Hazards and Management Strategies [Internet] [Cross-sectional Study]. [Ahmedabad]: SIT Study Abroad; 2014 [cited 2023 Sep 19]. Available from: https://digitalcollections.sit.edu/isp_collection/1820
16. Arya S, Kumar S. E-waste in India at a glance: Current trends, regulations, challenges and management strategies. Vol. 271, Journal of Cleaner Production. 2020.
17. Kumar R, Verma A, Rajput N. E-Waste Management in India: Formal Vs Informal Sectors. International Journal of Recent Advances in Multidisciplinary Research. 2017;04(08):2720–6.
18. Wath SB, Dutt PS, Chakrabarti T. E-waste scenario in India, its management and implications. Environ Monit Assess. 2011;172(1–4):249–62.
19. Dwivedy M, Mittal RK. An investigation into e-waste flows in India. J Clean Prod. 2012;37:229–42.
20. Abalansa S, El Mahrad B, Icely J, Newton A. Electronic Waste, an Environmental Problem Exported to Developing Countries: The GOOD, the BAD and the UGLY. Sustainability. 2021;13(9):5302.
21. Borthakur A, Govind M. Public understandings of E-waste and its disposal in urban India: From a review towards a conceptual framework. J Clean Prod. 2018;172:1053–66.
22. Jena SK, Goel S. E-Waste Generation in an Academic Campus: IIT Kharagpur As a Case Study. Pollut Res. 2015;34(2).
23. Subhaprada CS, P. K. Study on awareness of e-waste management among medical students. Int J Community Med Public Health. 2017;4(2):506.
24. V.Raval Rohan, Parasuraman G, Dutta R, Jain T. A study on the prevalence of electronic devices and awareness and practices of e – waste management among the medical students in a private medical college in Chennai. Ann Trop Med Public Health. 2021;23(23).

Tables

TABLE : 1 KNOWLEDGE REGARDING E-WASTE

Items (open-ended question)	Yes n (%)	No n (%)
Do you Know about any Hazardous substances present in e-waste?	99 (52.7)	89 (47.3)
Do you know about any Serious health risk/s or occupational Hazard associated with E-waste?	95 (50.6)	93 (49.4)
Do you know about any effects of improper disposal of the electrical and electronic equipment's on Environment?	77 (41.2)	110 (58.8)
Do you know of any electronic waste management policies currently implemented in India?	36 (19)	153 (81)
Do you read or got information about E-waste from anywhere?	67 (35.8)	120 (64.2)
Do you know someone who can collect your unused electronics for recycling, or dismantling and refabricating, or destroying?	37 (19.68)	151 (80.32)

TABLE 2: ATTITUDE REGARDING E-WASTE

Items	Yes n (%)	No n (%)	Not sure n (%)
Would you be willing to pay extra money in order to have someone effectively dispose your e-waste?	67 (35.6)	36 (19.1)	85 (45.2)
Do you think awareness programmes on e-waste management in your college/university can help you manage your e-waste better?	141 (75)	11 (5.9)	36 (19.1)
If you agree with the above question, are you willing to participate in such programmes in your college /university?	119 (63.3)	14 (7.4)	55 (29.3)
Would you be willing to learn about e-waste management, if included in your syllabus?	126 (67)	15 (8)	47 (25)

TABLE NO: 3 STUDY RESPONDENTS' RESPONSES ON E-WASTE'S HEALTH RISKS OR OCCUPATIONAL HAZARDS & ON THE IMPACT OF IMPROPER DISPOSAL OF THEIR UNWANTED ELECTRICAL AND ELECTRONIC EQUIPMENT

Respiratory health hazard	COPD, allergic response, lung damage, asthma, infections, silicosis & irritations, chronic bronchitis, lung cancer.
Organ dysfunction	liver, kidney, heart, chronic brain, lung, foetal damage, thyroid problems, renal diseases.
Neurological health hazard	convulsions, damage to central and peripheral nervous system, neurological disorders.
Reproductive & developmental disorders	genetic disorders, birth defects, Low birthweight, premature birth, stillbirth, DNA modification, hamper brain's development in children.
Musculo-skeletal & epithelial health hazard	Skin rashes & irritation, skeletal problems, skin cancer, muscle tumours, burns.
Miscellaneous	Immune damage, cancer, Interference with regulatory hormones, metal toxicity, mercury poisoning, heavy metal poisoning, endocrinal problems, digestive, immune system damage, genitourinary system damage (tubular dysfunction).
Environmental Hazard to Land	Land pollution, soil contamination, barren/infertile land, low agricultural yield.
Environmental Hazard to Air	Air pollution, emission of dangerous gases and destruction of ozone layer.
Environmental Hazard to Air	Water pollution, adverse health risks to marine organisms, risk of them being endangered, ground water contamination & toxicity due to seepage of toxins & metals into groundwater, acidification of water which may disrupt marine life/freshwater organisms, ocean pollution, tin and lead contamination of immediate environment including surface waters.
Miscellaneous	Global warming, aaccumulation of toxic elements in nature, toxicity in the environment.

TABLE NO:4 ATTITUDE REGARDING E-WASTE, REASON FOR IMPROPER DISPOSAL OF E-WASTE, DISPOSAL PRACTICE OF ELECTRONIC PRODUCTS THAT ARE NO LONGER IN USE

Attitude regarding e-waste	
Items	n (%)
Is e-waste disposal a problem in India?	172 (91.5)
Is there a need for awareness campaigns on collection and disposal of e-waste?	175 (93.1)
Will you be committed to proper e-waste disposal if better informed?	165 (87.8)
Are you willing to put some time to take your e-waste to recycler?	156 (83)
What is your Reason for improper disposal of e-waste?	
Items (Multiple Response Accepted)	n (%)
Lack of awareness	144 (76.6)
Time constraint	69 (36.7)
Inconvenience	82 (43.6)
No collection points	83 (44.1)
Others	4 (2)
What do you do with the electronic products that are no longer in use?	
Items	n (%)
Kept at home	90 (47.9)
Given to personal contact OR Donate	82 (43.6)
Thrown in trash/ landfills, throwing away with the regular wastes/ unused electronic products to dustbin	47 (25)
Given to E-waste collector/ licensed recycler	31 (16.5)
Burning/ incineration	8 (4.3)
Exchanged with dealer/ shop person/etc	117 (62.2)
Gave it to scrap dealers, kabaadiwalas	97 (51.6)
Second hand market	54 (28.7)
Repair	44 (23.4)