Effectiveness of planned teaching programme about 'E-waste management' among Jr. College going students

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ABSTRACT

E-waste is one of the fastest growing wastes in the world. Humans depend on such electronic goods to make our lives easier. The demand and supply for such electronic goods is only increasing and this in turn results in generation of huge amounts of electronic waste which is very hazardous and may pose a great threat to the health of the human, animals and for the entire Ecosystem. There is a great need of proper e-waste management with coordinated efforts has been realized. Considering that college students are an important and responsible component for the health of the society, they are the useful means for disseminating knowledge among the society in prevention and control of health hazards related to e-waste. It has been proved that planned teaching programme was more effective means of improving knowledge and creating awareness about E-waste management among college students.

Introduction

Todays Electronic Gadgets, Tommorow's Electronic Wastes

E waste is the one of the fast-growing waste in the world. Now a day, it's very hard to survive in this world without electronic gazettes. Human beings are extremely influenced by these gazettes that make our lives more comfortable. So to fulfil the requirement of the people, electronic goods are increasing day by day in the market, which finally results in the generation of e-waste (Lambe *et al.*, 2017).

In the last 10 to 15 years, there is rapid growth and technology changes in electronics, which leads to an increasing turnover of computers, tablets, phones, display screens, printers and manyother electronics. Consequently, business and household had seen highly growth in the volume of their electronics needing safe and cost effective end-of-life management. Electronics which are being disposed are commonly referred as e-waste. The word e waste, however, is a mismatch because it implies that such electronics have no value. The term e-

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scrap may be more appropriate since up to 99% of the materials making up an electronics product are recyclable and have monetary value in secondary markets.

Electronic waste is termed as discarded computers, office electronic equipment, entertainment electronics device, mobile phones, television sets and refrigerators which are completely damaged. As certain components of some electronic products contains materials which are hazardous, depending on their condition and density, so e -waste is considered as dangerous. The hazardous content of these materials pose a threat to human health and environment as well (Hischier *et al.,* 2005). Improper disposed of discarded computers, televisions, VCRs, stereos, copiers, fax machines, electric lamps, cell phones, audio equipment and batteries can lead and other substances into soil and groundwater. Discarded electrical or electronic devices are termed as electronic waste, e-waste, e-scrap, or Waste Electrical and Electronic Equipment (W.E.E.E) (Chiang, 2001).

Electrical and electronic equipment (EEE) contains valuable as well as health hazardous materials, if such materials are not disposed scientifically it may cause serious threat to the environment and public health. The presence of heavy metals (like Arsenic, Cadmium, Barium, Lead, Lithium, Mercury. Nickel, Zinc sulphide) and other toxic substances like PCB (Polychlorinated biphenyls) etc. may cause extreme harm, if they are not disposed of in eco-friendly manner.

Materials and Methods

The quantitative interventional research approach was used to assess effectiveness of planned teaching programme about E-waste management among Junior college students. The study was conducted on 100 Junior college going students of Anandrao Chavan Vidyalaya Malkapur, Karad. The researcher obtained ethical clearance and necessary permissions from   concerned authority to conduct the study. Tool prepared was divided into three sections including the items on socio-demographic data, awareness regarding E-waste and basic knowledge about E-waste. Convenience sampling technique was used. The investigator explained the purpose of the study to students. Ethical consent was taken from each participant. The data was tabulated and analysed in terms of descriptive and inferential statistics.

Results

100 participants responded to E waste questionnaire as instructed. Data presented in Table 1 shows that Majority of students (89%), belongs to 17 years and about (57%) of participants were male and (47%) of were Female. About (69%) of participants belongs to income is between Rs. 5000 to 15000. About (45%) of participants belongs from the urban and (55%) of participants belongs from rural area.

Table 1. Frequency and Percentage of student according to socio demographic variables. [n=100]

Sr. No.	Socio-demographic variables	Frequency	%
1.	Age in years		
	17	89	89%
	18	11	11%
2.	Gender		
	Male	57	57%
	Female	43	43%
3.	Type of family		
	Joint	55	55%
	Nuclear	45	45%
4.	Total number of family members.		
	1 to 4	39	39%
	5 to 8	46	46%
	9 to 12	18	18%
5.	Income in INR (Rs.)		
	5000 to 15000	69	69%
	16000 to 25000	21	21%
	26000 to 35000	7	7%
	35000 & above	3	3%
6.	Residency		
	Urban	45	45%
	Rural	55	55%

Table 2 reveals the knowledge score of students in Pre-test, about 7% of students is having Poor, 91% of students is having average and only 2% of students is having Good knowledge. In Post-test, after the intervention, all participants gains the 100% of knowledge.

Table 3 reveals that there is significant association found between income and level of knowledge of students regarding E-waste, because its P value is 0.0120 which is less than 0.05.

Similar study was conducted in Lucknow in 2013 with 120 respondents (60 from urban & 60 from semi urban) were selected from Lucknow city to assess the knowledge of young adults about E-waste. The study revealed that respondents of semi

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Table 2. Frequency and Percentage distribution of students according to knowledge of students in pre-test and post-test.

Knowledge Score	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Poor (1 to 13)	7	7%	0	0%
Average (14 to26)	91	91%	0	0%
Good (27 to 40)	2	2%	100	100%

Table 3. Pre-test -Association of level of knowledge of students with demographic variables.

Demographic Variables	Option	Level of Knowledge			Chi Square Value	P Value	Inference
		Poor	Average	Good			
1. Age	17 years	8	80	1	1.222	0.5427	NS
	18 years	0	11	0			
2. Gender	Male	4	54	0	2.764	0.8382	NS
	Female	3	38	1			
3. Type of family	Joint	5	46	2	2.945	0.2291	NS
	Nuclear	2	45	0			
4. Total no of family	1 to 4	1	36	0	12.036	0.0175	NS
	5 to 8	4	42	0			
	9 to 12	2	13	2			
5. Income	5 to 15	4	62	1	16.342	0.0120	S
	16 to 25	2	19	0			
	26 to 35	0	7	0			
	36 above	0	2	1			
6. Residency	Urban	2	43	0	2.586	0.2744	NS
	Rural	5	48	2			

urban area were having more knowledge than respondents of urban area. It is also revealed that the majority of respondents (60.8 percent) were having medium knowledge whereas only 1.7 percent respondents were having low knowledge about e-waste. There was significant difference between age and knowledge of respondents about e-waste which concludes that knowledge level may vary according

to age. Also there was no significance difference between sex and knowledge of respondents about e-waste which concludes that knowledge may not vary according to sex. (Sachan *et al.*, 2013)

Discussion

The aim of the study was to assess pre-test knowledge of college students regarding E-waste management and to see effectiveness of planned teaching programme. Students' knowledge about E-waste was assessed. Pre-test and post-test was analysed and revealed that-

Finding related to knowledge of students regarding E-waste Before intervention (pre-test) showed thatmajority of students (91%) are having Average knowledge, (7%) of students are having Poor and remaining (2%) of students are having Good knowledge.

Finding related to knowledge of students regarding E-waste after intervention (post-test) showed that all students (100%) are having Good Knowledge in the Post test, which shows that student gained knowledge after intervention.

POST-TEST
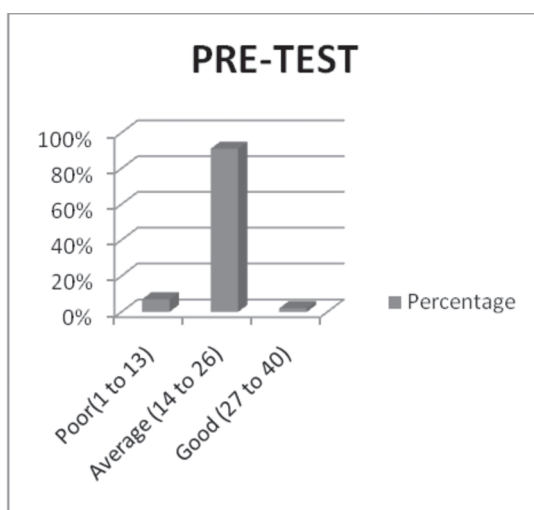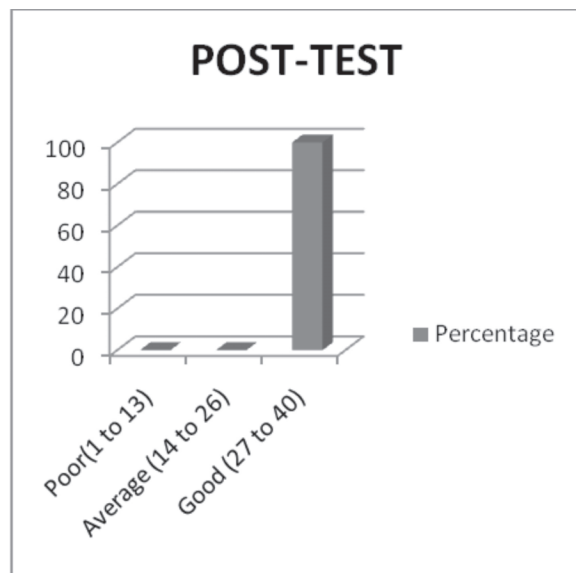
Association of level of knowledge of students and demographic variables before intervention (pretest) showed thatno any association was found with demographic variables such as Age, Gender, Type of Family and Residency with Level of Knowledge because P Value is less while Significant association was found between Income and Level of Knowledge.

Association of level of knowledge of students and demographic variables after intervention (posttest) showed that no any association was found between demographic variables and post-test knowledge score, because after intervention the knowledge score was improved 100%, itmeans the planned teaching programme was the effective means to improve the knowledge of college students.

A similar study was conducted in 2015 in different colleges of University of Delhi.120 students were selected for the study from which 60 students are from professional stream and 60 are from non-professional stream. It was found that there was no significant difference in the awareness regarding existence of E-waste among the students of professional and non-professional streams. Irrespective of their stream all were having awareness of existent of e-waste. But there was significant difference in the awareness regarding risk of E-waste among the professional stream students than with their non-professional counterparts. It means students of professional stream were having more awareness of risk of e-waste than the students of non-professional stream, but both the streams are unaware of proper e-waste management. (Kumar *et al.*, 2015)

Conclusion

It is today's necessity that without electronic gazettes nobody can survive in this modern era. So increasing the demands of electronic devices in our daily life which finally turns into the e- waste. According to the findings,electronic wastes is very hazardous to the health of any living animal and also for the entire Ecosystem. E-waste management is a great challenge to the public health and so the study was undertaken. The outcome of the study was gain in knowledge regarding e- waste and its management among the college students which will accept this challenge.

Acknowledgement

References

Chiang, S.K. 2001. *Circuit World*.Vol. 27, No 4.Asia: the growth engine for the world electronics industry over the next 20 years.

Cui, J. and Forssberg, E. 2003. Mechanical recycling of waste electric and electronic equipment: a review. *Journal of Hazardous Materials.* 99 (3) : 243-263.

Hischier, R., Wäger, P. and Gauglhofer, J. 2005. *Environmental Impact Assessment Review.* Does WEEE recycling make sense from an environmental perspective? The environmental impacts of the Swiss takeback and recycling systems for waste electrical and electronic equipment (WEEE). 25(5.25) : 5: 525-539. 10.1016/j.eiar.2005.04.003.

Kumar, A., Tyagi, S., Sharma, L. and Meenakshi, 2015. *RESEARCH GATE*. January 2015. A Study of E-Waste Management on the subject of Awareness of College Students.

Lambe, J. S., Shendge, S. S., Malgave, D. T. and Awati, T. D. *International Journal of Engineering Technology*, *Management and Applied Sciences.* 5(4) : 221-227.

Needhidasan, S., Samuel, M. and Chidambaram, R. 2014. *Journal of Environmental Health Science and Engineering.* Electronic waste – an emerging threat to the environment of urban India 2014.

Sachan, R. and Agarwal, S. 2013. *International Journal of Engineering Science Invention*. ISSN: 2319 – 6734. Knowledge of E-Waste among Young Adults. 2 : 39-41.