



Assess the Awareness on Ill Effect of Electronic Waste on Health among General Population of Selected Urban Community

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: "Electronic wastes" are discarded electrical or electronic devices which includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal [1] Per year approximately 20-50 million tons of Electronic Waste are disposed of globally [2]. The effects of these electronic materials are far worse in counties liked India where most of the people are having poor economic status that leads to engagement in picking up and recycling of trash cans and other dumps and they are not equipped with any proper protective measures [3]. Electronic waste is emerging as a serious public health and environmental issue in India. India is the "fifth largest electronic waste producer in the world"; approximately 2 million tons of e-waste are generated annually and an undisclosed amount of e-waste is imported from other countries around the world [4]

Objectives: 1. To assess the awareness on ill effect of electronic waste among general population of selected urban community. 2. To associate the awareness on ill effect of electronic waste on health among selected urban community with a selected demographic variable.

Material and Methods: Research Approach: Quantitative Research Approach.

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Research Design: Descriptive Research Design.
Setting of the study: The study was conducted at Aarvi Naka, Wardha. Population- General population of Aarvi Naka.
Sampling Technique: Non-Probability Sampling Technique.
Sample Size- 100.
Result: The result shows that 18% of the general population had poor level of awareness score, 38% had low level of awareness, 30% had average level of awareness and 14% of general population had high level of awareness score. Mean awareness score was 9.51 ± 3.98 and mean percentage of awareness score was 47.55 ± 19.94 . While dealing with the association of awareness score with their demographic variables, age in years of general population from selected urban community is statistically associated with their awareness score ($p=0.05$).
Conclusion: In this study the findings of the study shows that there is no significant association of awareness level on ill effect of electronic waste on health with the demographic variables like gender, educational status, religion, occupation, monthly family income, marital status and home ownership; but there is a significant relationship with age of the corresponding samples.

Keywords: Assess; awareness; Ill effect; electronic waste; population.

1. INTRODUCTION

Advancement in information technology took place after the industrial revolution and has entirely changed the lifestyle of mankind. This development has helped in the progress of daily living but also adversely lead to several pollution and may be contagious to health if they are not treated properly. The increase use of these electronics equipment also leads to increase in the amount of electronic waste. In some areas, wastes are recycled and then sold into market which become source of income. These electronic wastes can accumulate or settle themselves in water, food, and other materials and could become harmful if contact with the harmful chemicals present in them. Not only them being toxic for our health, but they could cause injury while handling them if they are not carefully disposed [5].

Electronic waste or e-waste describes discarded electrical or electronic devices. Used electronics which are destined for refurbishment, reuse, resale, salvage recycling through material recovery, or disposal are also considered e-waste. Informal processing of e-waste in developing countries can lead to adverse human health effects and environmental pollution [6].

Electronic waste is emerging as a serious public health and environmental issue in India. India is the "fifth largest electronic waste producer in the world"; approximately 2 million tons of e-waste are generated annually and an undisclosed amount of e-waste is

imported from other countries around the world [7].

E-waste contains a laundry list of chemicals that are harmful to people and the environment, like: mercury, lead, beryllium, brominated flame retardants, and cadmium, i.e., stuff that sounds as bad as it is. When electronics are mishandled during disposal, these chemicals end up in our soil, water, and air. To make matters worse, electronic waste is sometimes illegally exported to countries that don't have laws on handling and disposing of it. Once there, it's dumped. Sometimes, valuable materials are recovered, but often in unsafe working conditions [8].

Therefore, with consideration of all the health risks related to exposure with electronic wastes, this study aims to respond to the extent to which how much awareness do people recited in Aarvi Naka have in relation to management of electronic wastes.

1.1 Statement of the Problem

Assess the awareness on ill effect of electronic waste on health among general population of selected urban community.

1.2 Objectives of the Study

1. To assess the awareness on ill effect of electronic waste among general population of selected urban community.
2. To associate the awareness on ill effect of electronic waste on health among selected urban community with a selected demographic variable.

1.3 Hypothesis

1. H₁: There will be significant association between awareness on ill effect of electronic waste on health among general population of selected urban community with their selected demographic variables.
2. H₀: There will be no significant association between awareness on ill effect of electronic waste on health among general population of selected urban community with their selected demographic variables.

2. MATERIALS AND METHODS

One Hundred (100) samples of general population of Aarvi Naka were selected by Non-Probability convenience sampling technique at Aarvi Naka local area, Wardha. The inclusion criteria were: a) General population of Aarvi Naka who are present at the time of data collection. b) General population of Aarvi Naka who are willing participate in the study. The exclusion criteria were: a) General population of Aarvi Naka who have already attended the programme on the same topic. b) General population of Aarvi Naka who are not willing to participate at the time of data collection. In this study, Descriptive Research Design was used. The tool used were Questionnaire and Checklist. The data gathering process began from 1st-20th November 2020. The investigator visited the local area of Aarvi Naka, Wardha and obtained the necessary permission from the concerned authorities.

2.1 Statistical Analysis

Based on the objectives and the hypothesis the data were analyzed and interpreted by SPSS software.

3. RESULTS

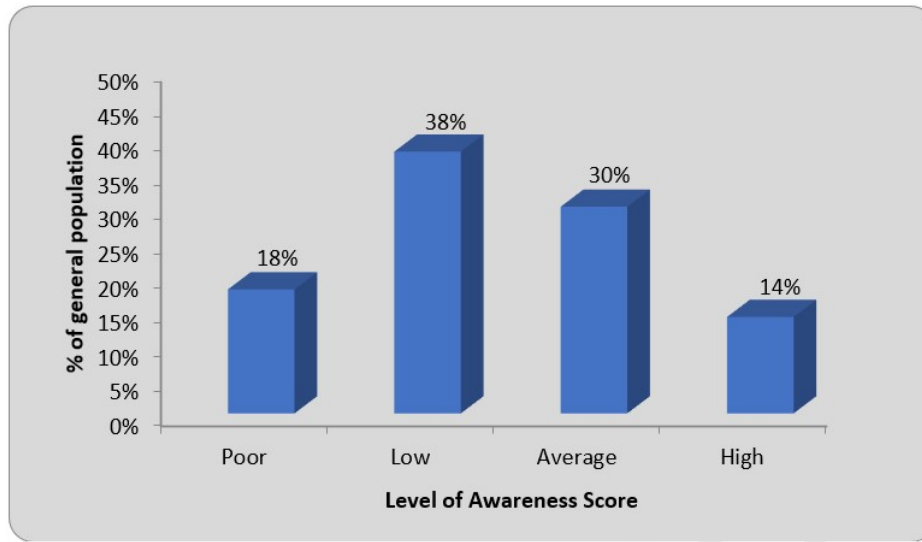
The data obtained to describe the sample characteristics including demographic variables (age, gender, educational status, religion, occupation, monthly income, marital status and home ownership), awareness level on ill effect of electronic waste on health among the general population of Aarvi Naka and the association of the awareness level with their demographic variables. The study shows that 18% of the general population had poor level of awareness score, 38% had low, 30% had average and 14% of general population had high level of awareness score. Minimum awareness score was 3 and maximum awareness score was 18. Mean awareness score was 9.51 ± 3.98 and mean percentage of awareness score was 47.55 ± 19.94 . While dealing with the association of the awareness level with their demographic variables, the study shows that age in years of general population is statistically associated with their awareness score ($p=0.027$) which was less than the acceptable level of significance i.e., ' p '=0.05. Hence it is interpreted that age in years of general population is statistically associated with their awareness score i.e., the older population of the collected sample are having better awareness level on the ill effect of electronic waste on health than the general population.

Table I shows that 18% of the general population had poor level of awareness score, 38% had low, 30% had average and 14% of general population had high level of awareness score. Minimum awareness score was 3 and maximum awareness score was 18.

Mean awareness score was 9.51 ± 3.98 and mean percentage of awareness score was 47.55 ± 19.94 .

Table 1. Assessment with level of awareness score n=100

| Level of awareness score | Score Range | Level of awareness Score | |
|--------------------------|-------------|--------------------------|------------|
| | | No of general population | Percentage |
| Poor | 1-5 | 18 | 18 |
| Low | 6-10 | 38 | 38 |
| Average | 11-15 | 30 | 30 |
| High | 16-20 | 14 | 14 |
| Minimum score | | 3 | |
| Maximum score | | 18 | |
| Mean awareness score | | 9.51 ± 3.98 | |
| Mean % awareness Score | | 47.55 ± 19.94 | |



Graph 1. Assessment with level of awareness score

4. DISCUSSION

Present study reported the awareness level on the ill effect of electronic waste on health among the general population of Aarvi Naka. In this study, Descriptive Research Approach was adopted. Self-structured questionnaire and checklist was used to assessed the awareness level in which the score range was divided into poor, low, average and high such that the highest score is 20, and the lowest score is 1. The study shows that 18% of the general population had poor level of awareness score, 38% had low, 30% had average and 14% of general population had high level of awareness score. Minimum awareness score was 3 and maximum awareness score was 18. Mean awareness score was 9.51 ± 3.98 and mean percentage of awareness score was 47.55 ± 19.94 . While dealing with the association of awareness score with their demographic variables, age in years of general population from selected urban community is statistically associated with their awareness score ($p=0.05$).

A study was done on “Exploring the Awareness Regarding E-waste and its Health Hazards among the Informal Handlers in Musheerabad Area of Hyderabad” by Sapna Mishra, B.R. Shamanna,¹ and Srinivasan Kannan. The objective of the study is to study the level of awareness about electronic waste and its health hazards amongst informal handlers in Musheerabad, Hyderabad. The researchers used a descriptive cross-sectional study and

conducted in randomly selected twenty-six waste handling centers from sixty of them in the locality. From each of the centers four handlers aged between 18 and 45 were randomly selected. Total of 104 handlers were interviewed using semi-structured schedule. Interviews were also conducted among 10 owners of such centres on the waste management practices. The results showed that about 72% of the handlers did not know the meaning of electronic waste and 71% were not aware of associated health risks, 85% did not use any protective gears, while 16% acknowledged health issues attributed to improper handling of e-waste, 77% felt their handling of e-waste was appropriate. Majority of center owners felt that informal e-waste handling does not pose any health risks, and reported that there was no awareness campaign by any agency as of then. This study highlights the need for awareness campaigns on proper e-waste management practices to ensure occupational safety among the waste handlers who belong to lower socio-economic strata [9].

Abhishek Kumar Awasthi and Jinhui Li had conducted a study on “Assessing resident awareness on e-waste management in Bangalore, India: a preliminary case study.” In this article, the E-waste management is evaluated in accordance from the resident’s awareness perspective in Bangalore city, India. The survey data revealed that about 58% male and 42% female responded and 35% of the participants belong to age range between 18 and 25 years. About 60% of respondent’s education

level was either graduate or post graduate, 27% high school to higher school, 10% higher educated (> post graduate), and 3% primary to middle. Only 30% of the respondents were confident with e-waste rules and regulation, while 39% of the respondents were of very little information. Indian e-waste management has been improving for the last few years and it continues to develop. Therefore, the findings can be valuable for better understanding the resident's awareness for e-waste management and also need to promote the environmentally sound management of e-waste in Bangalore, India [10].

5. CONCLUSION

In this study the findings of the study shows that there is no significant association of awareness level on ill effect of electronic waste on health with the demographic variables like gender, educational status, religion, occupation, monthly family income, marital status and home ownership; but there is a significant relationship with age of the corresponding samples.

CONSENT AND ETHICAL APPROVAL

Approvals were obtained from the following: Institutional Ethics Committee, Datta Meghe Institute of Medical Sciences (Deemed to be University) with reference No. DMIMS(DU)/IEC/2018-19/9767, Chief Medical Superintendent, AVBRH, Sawangi (M), Wardha and informed consent has been taken from the patient's parents.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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