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Assesment of personal protective equipment usage amongst e-waste handlers

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Abstract

Bulks of e-waste in the country are processed and handled in the major parts of urban slum area, where untrained laborers effectuate the hazardous process without individual protective gear, which are prejudicious not exclusively to their wellbeing yet in addition to the environment. Employers must provide the laborers with Personal Protective clothing/Equipment and train them for its usage. Proper disposal techniques regarding segregation of sharp edged waste items from squander bulk should be applied. It was found that majority of the respondents showed their concern about the safely keeping of sharp edged wastes items (54.3%) while less than half were ignoring such practice (45.7%). Respondents were using gloves (11.4%); spectacles (14.3%), mask (25.7%), shoes (28.6%), caps (8.6%) and only few of them were using all of the above (11.4%). Injuries faced by majority of respondents were skin irritation (14.3%), cuts and wounds (31.4%), infection (20%), accidents (2.9%), and fortunately some of them were facing no injuries while e-waste disposal (31.4%). The investment and right utilization of PPE can aid in evading and reducing working environment mishaps and disorder.

Keywords: E-waste, personal protective clothing, hazardous waste, health hazards

Introduction

In the growing economics, e-waste which is flowing from the wastes imports not only offers a business opportunity, but also satisfies the demand for cheap second-hand electrical and electronic equipment. An entire new economic sector is evolving around trading, repairing and recovering materials from redundant electronic devices. Though it is a source of livelihood for the urban and rural poor, it often causes severe risks to humans and the local environment (Annamalai, J. 2015). Personal protective equipment (PPE) is protective clothing which consists of head protectors, masks, heavy shoes or other equipments designed ergonomically to shield the user from possible injuries or infection. The perils tended to by protective equipment include physical, electrical, heat, chemicals, biohazards, and airborne particulate matter. The term Protective clothing is applicable for the traditional categories of clothing, and "protective gear" can be consecrated to other constituents such as pads, guards, shields, or masks, and others.

The aim of personal protective equipment covers reduced user vulnerability to various risks and health hazards when engineering controls and administrative controls are not practicable or effective to minimize these hazards to bankable levels. The provision of PPE is covered by the Personal Protective Equipment at Work Regulations 1992. Under this legislation, employers have duties concerning the selection, provision, maintenance, storage and correct use of personal protective equipment. Employees must be appropriately trained on how to use the PPE required for each specific task. The cost of providing PPE must be covered by the employer and employees should not be expected to contribute in any way, towards the provision or maintenance of PPE. (Essential skillz, 2018).

Health hazards by e-waste

E-waste is recycled to extract precious metals like gold, silver, copper etc, reusing the plastic body and functional parts of the electronics.

Plastics made from polyvinyl chloride (26% of the plastic found in e-waste by volume), once processed through uncontrolled open burning, can generate polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) which are persistent organic pollutants. This dioxins and furans can enter the body via inhalation, ingestion and skin absorption. Exposure to PCDD/PCDFs at high levels can lead to chloracne (severe skin disease), darkening of the skin, and altered liver function. Long-term exposure can lead to damage of the immune, nervous and endocrine systems and impaired reproductive function (Huo, X. 2007).

An estimated 22% of the mercury used worldwide each year goes into electrical and electronic equipment including batteries, flat-panel display screens, and switches. Even very small levels of mercury exposure are known to cause damage to the brain, spinal cord, kidneys, liver and even for a developing fetus. (Radha, G, 2002). Cadmium is found in plastics, cadmium plated steel, solders, and TV picture tubes and its toxicity can lead to kidney, bone, and pulmonary damage. There are three modes of exposure: Dermal,

pulmonary (lungs), and gastrointestinal (mouth). (Khetriwal, DS 2005).

Objectives

1. To study the frequency of using Personal Protective Clothing/Equipment while working.
2. Assessment of injuries/hazards faced by workers during e-waste management process.

Methodology

Present study was conducted in Udaipur city of Rajasthan state. To procure the sample, the Waste Handler's Association was contacted. After retrieving their details, 35 electronic waste handlers which are functioning in the city were contacted to collect data for the study. A questionnaire was developed by the researcher for the data collection. All the facilities available at College of Home Science, Maharana Pratap University of Agriculture and Technology, Udaipur were used for conducting the proposed investigation.

Results

Table 1: Distribution of respondents according to the safekeeping of sharp objects and safety gears/personal protective equipment used while working, n=35

| S. No. | Items | Frequency | Percentage | |
|--------|---------------------------------------|------------------|------------|------|
| 1. | Safekeeping of sharp objects | Yes | 19 | 54.3 |
| | | No | 16 | 45.7 |
| | Total | 35 | 100 | |
| 2. | Use of Safety aids used while working | Gloves | 4 | 11.4 |
| | | Spectacles | 5 | 14.3 |
| | | Mask | 9 | 25.7 |
| | | Shoes | 10 | 28.6 |
| | | Cap | 3 | 8.6 |
| | | All of the above | 4 | 11.4 |
| | Total | 35 | 100 | |

Workplaces are generally susceptible to cause minor and major injuries to the workers and waste coming from machines and electronic equipments can cause fatal casualties. Personal Protective Equipment (PPE) should be supplied to each worker and it must be used where necessary (Wikipedia, 2018). It can be visualized from Table above that out of total respondents only 54.3 per cent were safely keeping the sharp objects for worker safety while 45.7 per cent were still ignorant about it. To handle such situation many safety methods are used like providing gloves, spectacles, mask, shoes, cap, etc but researcher found that only 11.4 per cent respondents were providing all these

worker safety aids while 28.6 per cent of them provided only shoes, 25.7 per cent provided them masks, 14.3 per cent gave spectacles to their workers, 11.4 per cent provided them gloves and 8.6 per cent respondents only gave them caps which is a violation of worker's safety. But in the observation schedule researcher noticed that there were no such safety aids provided to the workers and the workers were completely exposed to the hazardous waste. It was also observed that the waste handlers were not that much concerned about the safety of their workers and ignored the usage of worker safety equipment which is illegal.

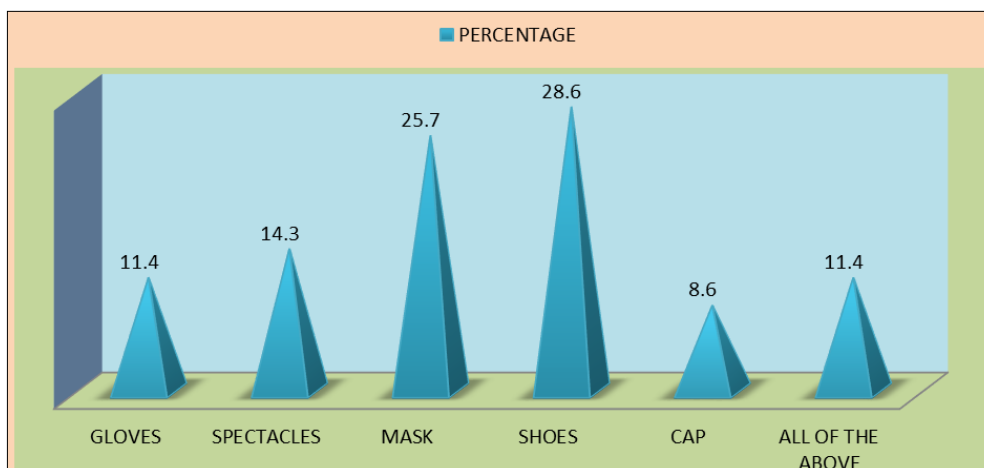


Fig 1: Safety gears/personal protective equipment

Table 2: Distribution of respondents according to their injuries faced during e-waste management

| S. No. | Items | Frequency | Percentage |
|--------|-------------------|-----------|------------|
| 1. | Skin irritation | 5 | 14.3 |
| 2. | Cuts and wound | 11 | 31.4 |
| 3. | Infection | 7 | 20.0 |
| 4. | Accident | 1 | 2.9 |
| 5. | None of the above | 11 | 31.4 |
| | Total | 35 | 100 |

E-waste consists of many harmful chemicals and metals which can cause severe health and environmental hazards. In the above table data reveals that 14.3 per cent respondents faced skin irritation while handling electronic waste, 31.4 per cent suffered from cuts and wounds, 20 per cent experienced various infections, 2.9 per cent of them faced no such injuries and there was only one accident. It was witnessed by the researcher that the working conditions were susceptible for accidents and the workers were vulnerable for all of the above mentioned injuries. It was noted in observation schedule that there was also a lack of ventilation because the area was surrounded by huge piles of e-waste which increased the chances of heat stress problems like hyperthermia, heat exhaustion, dizziness, nausea, and heat stroke.

Conclusion

Building a superior comprehension regarding informal recycling of e-waste and executing additional supportive approaches that could result in hundreds of job opportunities for low-skilled laborers in a unhazardous environment is a sustainable solution for the e-waste safe disposal issue. Better laws and policies should be formulated by the government regarding mandatory practical application of personal protective clothing and equipments for e-waste handling laborers.

References

1. Annamalai J. Occupational health hazards related to informal recycling of E-waste in India: An overview. *Indian Journal of Occupational and Environmental Medicine*. 2015; 19(1):61-65.
2. Huo X, Peng L, Xu X, Zheng L, Qiu B, Qi Z *et al.* Elevated Blood Lead Levels of Children in Guiyu, an Electronic Waste Recycling Town in China. *Environ Health Perspect*. 2007; 115:1113-7.
3. Khatriwal DS, Kraeuchi P, Schwaninger M. A Comparison of Electronic Waste Recycling in Switzerland and In India. *Journal of Environmental Impact Assessment Review*. 2005; 25:492-504.
4. Essential Skillz. The Importance of Personal Protective Equipment (PpE), 2018. Retrieved from <https://www.essentialskillz.com/workplace-safety/the-importance-of-personal-protective-equipment-ppe> dated on 14/01/2019.