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HEAVY METAL POLLUTION: AWARENESS FORMATION THROUGH ENVIRONMENTAL EDUCATION

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Abstract

This paper highlights the need for creating awareness among the secondary school students about pollution created by heavy metals and suggests appropriate management options that can be implemented for the scientific disposal of heavy metals through our present education system. In the present study, investigators adopted Survey Method. The data collected from a sample of 68 secondary school teachers. The data collected through questionnaire. The collected data was analyzed by computing percentage. The major findings of the study reveal that there is an urgent need for creating awareness about pollution created by heavy metals. Education is a best means to create awareness about heavy metal pollution among the future generation.

INTRODUCTION

The environmental pollution is escalating frighteningly in the recent decades. In the center of all the pollutants, heavy metals are significant because of their outsized blow on living thing. The presence of heavy metals in top soil, water and atmosphere is widely increasing all over the planet. Due to the increasing heavy metal pollution, Microbial, Plant, Animal and Human systems have been detected toxic substances in their body. Polluted environment leads to disease and ill health.

The heavy metal refers to any metallic chemical element that has a relatively high density and is toxic or poisonous at low concentrations. Some example for heavy metals are mercury (Hg), cadmium (Cd), arsenic (As), chromium (Cr), thallium (Tl), and lead (Pb). The magnitude and effect of heavy metal pollution on earth is a scorching theme of research which is being studied extensively (Prasad, 2011). Heavy metal pollution can arise from many sources but most commonly arises from vehicles, the purification of metals etc. Electroplating is the primary source of chromium and cadmium. Cadmium, lead and zinc are released in tiny particulates as dust from rubber tires on road surfaces; the small size allows these toxic metals to rise on the wind to be inhaled, or transported onto top soil or edible plants.

The growing population and fast urbanization has posed several serious challenges to solve pollution related problems in rural as well as urban areas. All societies, particularly in the developing world are seriously concerned about presence of heavy metals in soil, water and atmosphere. The accessibility of safe water, air, and food is the basic, essential vital need of the all living being. There is a saying "prevention is better than cure" so; prevention of pollution is in our hand (Phillips and Balge, 2007). Every person has responsibility to take part in preventing the growing pollution. The environmental sustainability has to be maintained through a scientific, long term environmental management practices.

BACKGROUND OF THE PROBLEM:

Heavy metal pollutants can localize and lay dormant, which can have severe effects on the environment. Heavy metal toxicity can result in damaged or reduced mental and central nervous function, lower energy levels, and damage to blood composition, lungs, kidneys, liver, and other vital organs. Long-term exposure may result in slowly progressing physical, muscular, and neurological degenerative processes that mimic Alzheimer's disease, Parkinson's disease, muscular dystrophy, and multiple sclerosis. Allergies are common, and repeated long-term contact with some metals may cause cancer. Unlike organic pollutants, heavy metals do not decay and thus pose a different kind of challenge for remediation (Gupta, 2010).

Environmental sustainability through scientific environmental management is the major challenge of every government in the world. Each and every member of the society has to enter into a crucial position in scientific environmental management. All over the world, particularly in the developing nations are seriously

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concerned about the growing problem of pollution created by heavy metals. The growing population and fast urbanization has posed several serious challenges to solve the problems created by heavy metal pollution in rural as well as urban areas. What is the remedy for solving the pollution created by heavy metals in the nature? Pollution of environment through heavy metals all over the worldwide causing concerns among people to protect the planet for survival of all species living on it. Discussions on several forums came to a conclusion to introduce this issue in form of curriculum in formal system, so that awareness is generated from earlier ages so that the younger generation develops a proper, healthy, and useful living style that helps in reducing the pollution.

The present paper highlights the need for creating awareness among the secondary school students about pollution created by heavy metals and suggests appropriate management options that can be implemented for the scientific disposal of heavy metals through our present education system.

OBJECTIVES OF THE STUDY

1. To find out the Secondary school teacher's environmental awareness with respect to Heavy Metal Pollution.
2. To compare the environmental awareness with respect to Heavy Metal Pollution among the female and male Secondary school teachers of Trichur District.
3. To compare the environmental awareness with respect to Heavy Metal Pollution among the Rural and Urban Secondary school teachers of Trichur District.
4. To compare the awareness with respect to Heavy Metal Pollution among the Government and Private Secondary school teachers of Trichur District.
5. To reveal the views of secondary school teachers for protecting our environment from growing heavy metal pollution.
6. To suggest measures for solving the problems created by heavy metal pollution.

METHODOLOGY

In the present study, investigators suitably employed survey method. The data collected from a sample of 68 secondary school teachers. While selecting the sample due consideration was given to gender, locale and type management of the school. The data collected through Heavy Metal Pollution Awareness Questionnaire. The Heavy Metal Pollution Awareness Questionnaire was prepared by the investigators. Heavy Metal Pollution Awareness Questionnaire consists of thirty items.

ANALYSIS AND INTERPRETATION OF THE DATA

The collected data was analyzed by computing percentage. The following tables give a clear picture about the analysis of the comparison of awareness of secondary school teachers regarding Heavy Metal Pollution.

Table 1. Comparison of Awareness of Secondary School Teachers regarding Heavy Metal Pollution

Total	Low		Medium		High		Total
	No.	%	No.	%	No.	%	
Secondary School Teachers	22	32.35	34	50	12	17.64	68 100

Table 1 demonstrates the level of awareness among secondary school teachers regarding Heavy Metal Pollution. The result show that [50%] of teachers showed medium level and 32% showed low level awareness about heavy metal pollution.



Table 2. Comparison of Awareness among Female and Male Secondary School Teachers

Si. No.	Gender	Low		Medium		High		Total	
		No.	%	No.	%	No.	%	No.	%
1	Female teachers	19	27.94	17	25.00	2	2.94	38	55.88
2	Male teachers	3	4.41	17	25.00	10	14.7	30	44.11

Table 2 shows the comparison of awareness among female and male secondary school Teachers regarding Heavy Metal Pollution. The male teachers showed high awareness than the female teachers. Hence, it can be concluded that, when comparing the awareness of female and male secondary school Teachers regarding Heavy Metal Pollution, the male teachers showed high awareness than female secondary school teachers.

Table 3. Comparison of Awareness among Rural and Urban Secondary School Teachers Regarding Heavy Metal Pollution

Si. No.	Locale	Low		Medium		High		Total	
		No.	%	No.	%	No.	%	No.	%
1	Rural school teachers	17	25.00	15	22.05	2	2.94	34	50.00
2	Urban school teachers	5	7.35	19	27.94	10	14.70	34	50.00
	TOTAL	22	32.35	34	50.00	12	17.64	68	100

Table 3 depicts the comparison of awareness among rural and urban secondary school teachers regarding Heavy Metal Pollution. The rural teachers showed low awareness than the urban teachers. Hence, it can be concluded that, when comparing the awareness of rural and urban secondary school teachers regarding Heavy Metal Pollution, the urban teachers showed high awareness than rural secondary school teachers.

Table 4. Comparison of Awareness among Government and Private Secondary School Teachers Regarding Heavy Metal Pollution

Si.No.	Type of school Management	Low		Medium		High		Total	
		No.	%	No.	%	No.	%	No.	%
1	Government school	7	10.29	18	26.47	9	13.23	34	50
2	Private school	15	22.05	16	23.52	3	4.41	34	50
	Total	22	32.35	34	50.00	12	17.64	68	100

Table 4 illustrates the comparison of awareness among government and private secondary school teachers regarding Heavy Metal Pollution. The private secondary school teachers showed low awareness than the government secondary school teachers. Hence, it can be concluded that, when comparing the awareness of government and private secondary school teachers regarding Heavy Metal Pollution, the government teachers showed high awareness than private secondary school teachers.

FINDINGS OF THE STUDY

- The male secondary school teachers have been found to have better awareness regarding Heavy Metal Pollution in comparison to their counter parts i.e. female secondary school teachers.



- The urban teachers of secondary schools have been found to have better awareness regarding Heavy Metal Pollution in comparison to their counter parts i.e. rural secondary school teachers.
- The teachers of Government secondary schools have been found to have better awareness regarding Heavy Metal Pollution in comparison to their counter parts i.e. private secondary school teachers.
- The teachers revealed that, the existing Environmental Education programmes are not much enough to create awareness regarding Heavy Metal Pollution among the secondary level students.
- Teacher's suggestions for creating awareness regarding Heavy Metal Pollution are as follows: The educational planners and policy makers have to add topics related to Heavy Metal Pollution into the secondary school curriculum. The teaching-learning material for teachers as well as students has to revise by incorporating pollution related topics. A number of co-curricular activities including nature clubs can be incorporated with the student's activities. School authorities and management should take initiative to campaign proper scientific pollution management practices among the teachers as well as secondary school students.

RECOMMENDATIONS

- The common people are not bothered about seriousness of the growing environmental issues created by Heavy Metal Pollution. The toxic rudiments of Heavy Metals come into the human body mainly through water, food and air. Some items like Cosmetics, tooth paste, drugs also contribute significantly. So, Public awareness about heavy metal pollution should be made through all available media in an extensive way.
- Educative system can be an instrument for creating consciousness about growing heavy metal pollution. Talks by environmentalists and interaction between environmental scientists and students can be arranged to create awareness about heavy metal pollution among school children.
- The school curriculum should include the topics related to heavy metal pollution.
- Teachers can play a vital role in campaigning about heavy metal pollution among the younger generation. So teachers should be made competent to handle the problem of heavy metal pollution through in-service training facilities like seminar, workshop, discussion etc.
- There should be regular monitoring and control by governmental bodies or agencies over the concentration of heavy metals in air, water, soil, food and consumer items.
- The school curriculum should include the topics related to heavy metal pollution.
- Teachers can play a vital role in campaigning about heavy metal pollution among the younger generation. So teachers should be made competent to handle the problem of heavy metal pollution through in-service training facilities like seminar, workshop, discussion etc.
- There should be regular monitoring and control by governmental bodies or agencies over the concentration of heavy metals in air, water, soil, food and consumer items. Water supplied by government, should be free of toxicants including heavy metals and minerals. Periodic examination of water quality is necessary in major water sources.
- Reasonably priced devices for water purification at domestic level have to be supplied in economically poor households.

CONCLUSION

The major findings of the study reveal that there is an urgent need for creating awareness about pollution created by heavy metals. We have to develop an environmental friendly culture all over the country. Education is the best means to create awareness about heavy metal pollution among the future generation. So, through schooling, let us make our younger generation competent to fight against evil problems created by Heavy Metal Pollution and make them the torch bearers of scientific environmental management practitioners.



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