A COMPARATIVE STUDY ON AWARENESS ABOUT WATER POLLUTION AMONG THE STUDENTS OF SECONDARY LEVEL

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Abstract

Today water pollution is considered not only the matter of public health but also it is the matter of conservation, aesthetics and preservation of natural beauty and resources. India's most rivers and lakes are polluted due to industrial waste discharge and city sewage. Day after day those water bodies are becoming more polluted. Those turbid, unpleasant, bad smelling, polluted water bodies are unfit for drinking, bathing and washing or other purposes.

In this study we are showing the awareness about water pollution between the male and female children of secondary level in rural and urban Bengal. For this study our selected population was all students of West Bengal of Secondary Education level and their age groups were between 14-15 years. Students are randomly selected form different districts (Nadia, North-24parganas, Murshidabad, Hooghly and Howrah) of West Bengal. Total number of sample was 60. For the purpose of data collection we have used self made questionnaire having 20 questions and it was the 4 point scale questionnaire. To compare their awareness about water pollution we have used simple mean and pi chart and bar diagram.

Key words: Water pollution, Arsenicosis, Amoebiosis, Mercury poisoning, Minamata, Skeletal fluorosis, black-foot disease, blue-baby syndrome, hyperkeratosis, Itai-Itai.

Introduction

Water pollution is the presence of harmful materials in water in sufficient concentrations to make it unfit for use. Water contamination destroys natural ecosystems that support human health, food production and biodiversity. Water-borne diseases kill millions of people world-wide every year. Livelihoods such as fishing, agriculture and animal husbandry etc. are affected by polluted water[1]. Freshwater ecosystems are under threat due to water pollution.

India's major, 55 minor and several hundred small rivers receive millions of liters of sewage, industrial and agricultural wastes. The most polluting source for rivers is the industrial waste discharge and city sewage. Recently about 10% of the waste water generated is treated; the rest is discharged as it is into our water bodies. Due to this, pollutants enter rivers, lakes and

groundwater. Normally water is never pure in a chemical sense. It contains impurities of various kinds dissolved as well as suspended. These include dissolved gases (H_2S, CO_2, O_2, NH_3 etc.), dissolved minerals (Ca, Mg, Na various salts etc.), suspended materials (clay, silt, sand) and even microbes.[2-5] These are natural impurities derived from atmosphere, catchment areas and the soil. They are in very low amounts and normally do not pollute water. Water is an increasingly scarce resource in West Bengal as in most other parts of India. The main source of water in West Bengal is rainfall, and because of relatively high rainfall, the State is well endowed with ground water resources. But the distribution is not uniform over West Bengal. The demand for water is generated from a number of different sources. There are economic functions in the agriculture sector, the urban sector, the industrial sector, the power sector and for transport and navigation. In addition, there are the survival needs of the domestic household sector, the forest sector and a range of ecological systems.

The quantity dimension of the water resource problem is reflected through the gradual scarcity of water; the quality dimension is manifested in water pollution of different kinds. Environment degradation leads to degradation of both air and water and acts as an impediment to healthy life. While air pollution is basically an urban phenomenon, floating dust particles and chemical materials out of mostly agricultural activities may pollute surface and underground water in rural areas. Rural and urban waste water including water wastes from cattle, chemical industries, breweries and distilleries, vegetable oil refineries, paper and pulp makers, tanneries and pesticide plants contribute to the pollution.

Water quality is a challenge in the state of West Bengal. Nine out of twenty two districts of the state have excess arsenic in ground water. The first of arsenicosis or arsenic poisoning was discovered in West Bengal in 1982. Since then, it has been found that the problem of excess arsenic in drinking water exists in at least 75 blocks spread over 8 districts, accounting for an estimated population of over 13.5 million people. These districts are Malda, Murshidabad, Nadia, North 24-Parganas, South 24-Parganas, West Bardhaman, East Bardhaman, Howrah and Hooghly. Excess arsenic in drinking water gives rise to a number of health problems, including gastro-intestinal disturbances, hyper-pigmentation and neuropathy, and even skin cancer in severe cases. There is social implication and impact on people's livelihoods also. This means, identification and treatment of those affected, the provision of alternative sources of drinking water and an effective communication strategy are required along with technical and infrastructural measures.

Some Major Water Pollutants and Their Effects on Humans

WATER POLLUTANTS	**EFFECTS ON HUMAN HEALTH**
Domestic sewage contains pathogens like virus, bacteria, parasitic (protozoa and worms) etc.	Contaminated water carries germs of water borne disease like Jaundice, Cholera, Typhoid, Amoebiosis, Diarrhoea, Hepatitis, Ascariasis, Dysentery etc. This contaminated water is unfit for drinking, bathing and swimming.
Heavy metal- Mercury(Hg)	Causes Minamata disease due to consumption of fish captured from mercury contaminated water. • It was first detected in the Minamata Bay in Japan in 1952, as people suffered from this disease by

	consuming fish captured from mercury contaminated Minamata Bay. • Mercury compounds in waste water get converted into extremely toxic methyl mercury by bacterial action. This compound affects the nervous system and cause: • Numbness of limbs, lips and tongue • Deafness • Blurring of vision • Mental derangement etc.
Cadmium	Causes Itai-Itai disease (ouch-ouch disease, a painful disease of bones and joints). • It also causes cancer of liver and lung.
Excess nitrate in drinking water	It is very dangerous for human health. Can be fatal for infants. • Causes blue-baby syndrome.
Excess fluoride in drinking water	• Causes mental disorders and neuromuscular disease. • Causes hardened bones and stiff and painful joints called skeletal fluorosis.
Arsenic in water (more than 10 micrograms/lit)	Chronic (long term) exposure to arsenic causes black-foot disease. • Arsenic poisoning causes peripheral neuritis and hyperkeratosis. • It also causes skin and lung cancer.

Objective of the Study

- To study the awareness about the water pollution among the students of secondary level in rural and urban Bengal.
- To compare the awareness about the water pollution between boys and girls of rural and urban Bengal.

Methodology

Population:

All students were from the West Bengal of Secondary Education and their age groups were between 14-15 years.

Sample:

Students are randomly selected form different districts (Nadia, North-24 Parganas, Murshidabad, Hooghly, and Howrah) of West Bengal. Total number of sample was 60. All students were from the rural and urban areas of West Bengal. Districts were selected purposely.

Tools for Data Collection:

- Self-made Questionnaire having 20 questions.
- It was a 4 point scale questionnaire.
- Name of the institute, name, class, age, sex, date place and area were mentioned in that questionnaire
- It was to be filled up by the students.

Methods Used For Data Collection:

- Pre prepared questionnaires were given to the students. They were requested to fill it up carefully within 45minutes.
- In this questionnaire three important variables are mentioned, which are- district, area (rural/ urban), and sex.
- From this data we can present district wise zone wise and sex wise comparison about the awareness of water pollution.
- At first we calculate the mean from this data and then put into the graph.
- From these graphs we can compare every variable such as rural and urban, male and female, and comparison of selected five districts.

Graphical Representation:

Table 1: Area wise Comparison about the awareness of water pollution:

SL NO.	AREA	MEAN
1	RURAL	87.1667
2	URBAN	83.3333

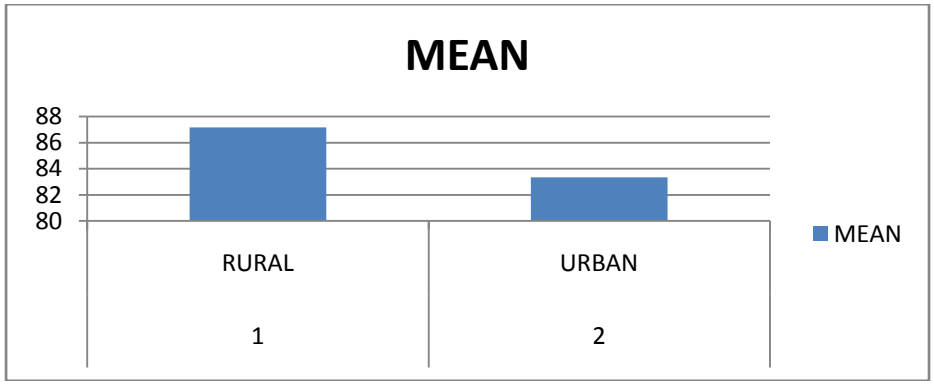

Fig 1: Area wise Comparison about the awareness of water pollution

From this graph we can see that rural and urban pupils both are strongly aware about water pollution but rural pupils are more aware than the urban pupils.

Table 2: Gender wise comparison about the awareness of water pollution:

SL No.	SEX	MEAN
1	MALE	86.9333
2	FEMALE	83.5667

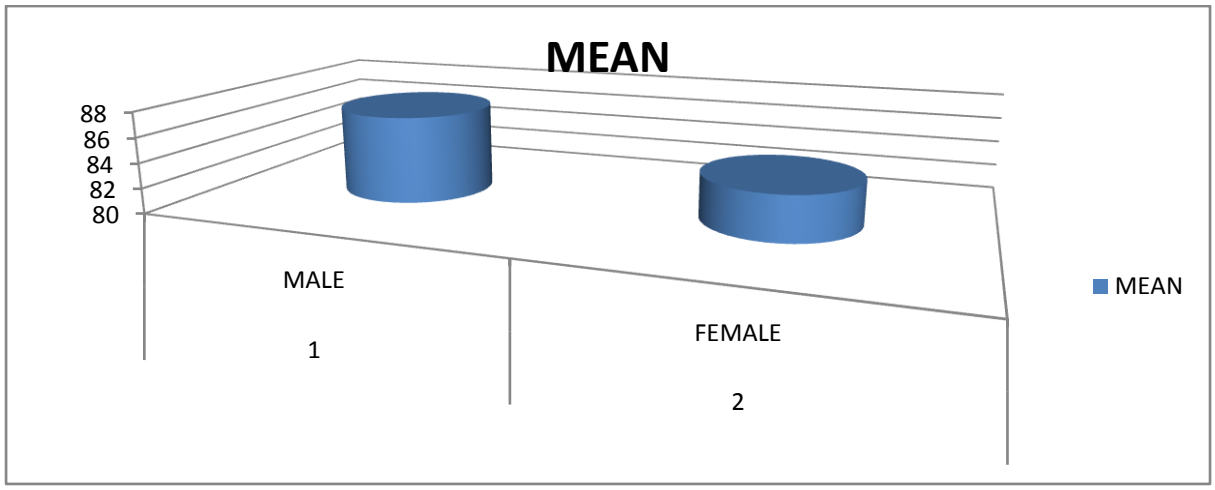

Fig 2: Gender wise comparison about the awareness of water pollution

From this diagram we can see that boys are more aware than the girls about water pollution.

Table 3: Area and gender wise comparison about the awareness of water pollution:

SL. No.	ZONE	MEAN
1	RURAL BOYS	89.9333
2	URBAN BOYS	83.9333
3	RURAL GIRLS	84.4
4	URBAN GIRLS	82.7333

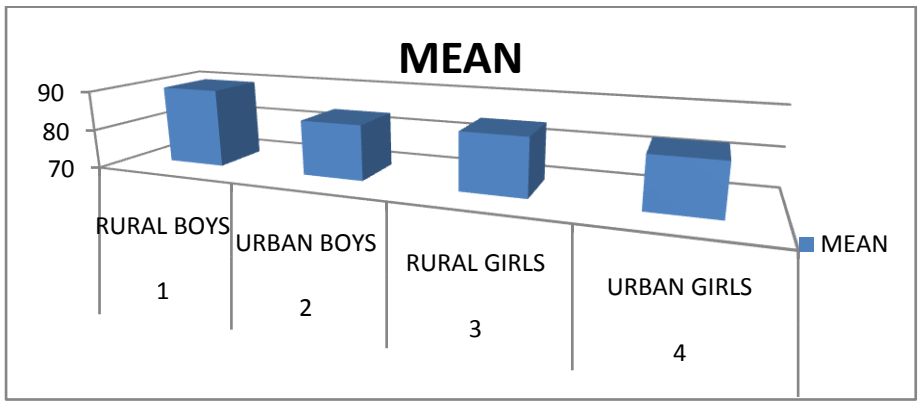

Fig 3: Area and gender wise comparison about the awareness of water pollution.

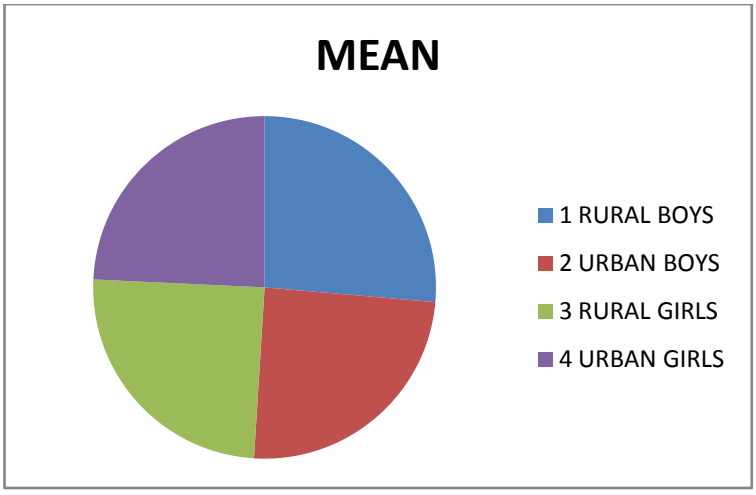

Fig 4: Area and gender wise comparison about the awareness of water pollution

From this pie chart we can see that all pupils of secondary level, both rural boys and girls and urban boys and girls are strongly aware about water pollution but it can also be seen here that rural boys are more aware than the rural girls and rural girls are more aware than the urban boys and urban boys are more aware than the urban girls. From this we can say that **rural boys of secondary level are the most aware about water pollution.**

Table 4:District wise comparison about the awareness of water pollution:

SL. No.	DIST.	MEAN
1	NADIA	85.3333
2	N-24 PARGANAS	85.4167
3	MURSHIDABAD	88.3333
4	HOWRAH	82
5	HOOGLY	85.1667

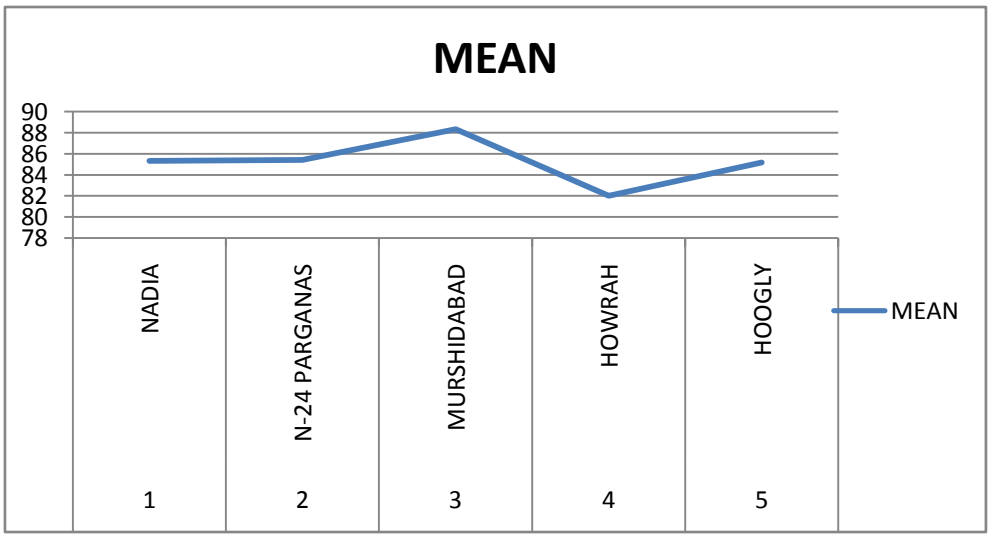

Fig 5: District wise comparison about the awareness of water pollution

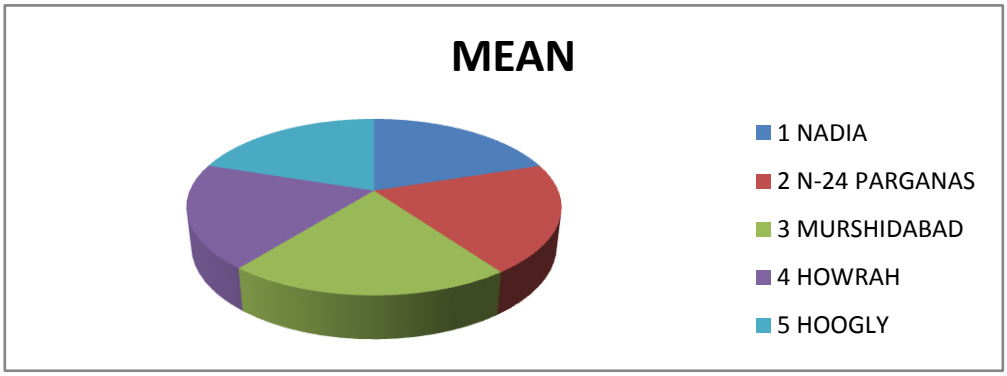

Fig 6: District wise comparison about the awareness of water pollution

We represented here comparison of selected five districts with the help of above diagrams. From these diagrams we can see that the pupils from Murshidabad are very much aware about the water pollution as compared to pupils from other four districts. Pupils from Nadia, North-24 parganas and Hoogly have almost same level of awareness about water pollution. But pupils of Howrah are less aware about water pollution than the pupils of other four districts.

Conclusion

From this study we can see that pupils of secondary level are very much aware about water pollution.[6-7] From this study we can see that the pupils from Murshidabad are very much aware about water pollution than the pupils from other four districts. Pupils from Nadia, North-24 Parganas and Hoogly have almost same level of awareness about water pollution. But pupils of Howrah are less aware about water pollution than the pupils of other four districts.

From this study we can also see that all pupils of secondary level, both rural boys and girls and urban boys and girls are strongly aware about water pollution but it can also be seen here that the rural boys are more aware than the rural girls and rural girls are more aware than the urban boys and urban boys are more aware than the urban girls. From this we can say that rural boys of secondary level are very much aware about water pollution.[6-7]

This has become possible due to the upgraded syllabus of environmental science of secondary level of west Bengal Board. [6-8] At this level the pupils can correlate their study with the real environmental situations.[9-12] The students also want to actively take part in pollution control and awareness program.[6,7,12]From this study we can understand that illiteracy and lack of hygiene in our society are the secondary causes of water pollution. But one good thing is that our younger generations are much more conscious and aware about such pollution and its ill effects.[8]

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