

Knowledge, Attitude and Practices on Recycling Activity Among Primary School Students in Hulu Langat, Selangor, Malaysia

Nur Aisyah Sobri and Haliza Abdul Rahman

Universiti Putra Malaysia (UPM), Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, 43400 Serdang, Selangor, Malaysia

The objective of the paper was to study the knowledge, attitude and practice of recycling activities among 2 primary school students in Hulu Langat, Selangor, Malaysia. A comparative cross-sectional study was carried out among primary school student in Kajang and Semenyih, Hulu Langat, Selangor. A number of 188 primary school students were selected as respondents. A set of questionnaire was used to obtain the information about socio-demographic, knowledge, attitude and practices of recycling activity. For knowledge level, the urban schools have 75.7% in good knowledge while rural schools have 71.3%. For the attitude level, 72.3% of urban school have good attitude while only 53.2% of rural school have good attitude. Both school shown practices in satisfactory level which is 74.5% in urban while 62.8% in rural school. For the mean difference, there was a mean difference between knowledge ($p < 0.05$, $p = 0.003$), attitude ($p < 0.05$, $p = 0.008$) and practices ($p < 0.05$, $p = 0.047$) between rural and urban school. Furthermore, there was an association between attitude ($p < 0.05$, $p = 0.025$) and practices ($p < 0.05$, $p = 0.034$) towards the rural and urban school. However, there was no association between knowledge and location of school ($p > 0.05$, $p = 0.249$). There was an association between knowledge ($p < 0.005$, $p = 0.002$) and attitude level ($p < 0.005$, $p = 0.001$) to the practices level. For conclude the primary school from both rural and urban school students have a good knowledge and attitude toward recycling but moderate in recycling practices. Thus, the students should be nurtured to increase their practices in recycling activities, such as having environmental education at home and in school, joining recycling awareness campaign and recycle activities.

KEYWORD

Attitude, Knowledge, Practices, Primary school students, Recycling activity.

AUTHOR

1. Mr. Nur Aisyah Sobri, Ex-student, Bachelor of Environmental and Occupational Health, Environmental and Occupational Health Department, Faculty of Medical and Health Sciences, Universiti Putra Malaysia (UPM), 43400, Serdang, Selangor, Malaysia.

2*. Dr. Haliza Abdul Rahman, Associate Professor in Environmental Management, Environmental and Occupational Health Department, Faculty of Medical and Health Sciences, Universiti Putra Malaysia (UPM), 43400, Serdang, Selangor, Malaysia.

Organophosphate Insecticide Exposure and General Intelligence of Primary School Children in Tanjung Karang, Selangor, Malaysia

Nurul Husna Miswon, Zailina Hashim, Hayati Kadir Shahar, Nur Naqibah Lokhman, Shaharudin Mohd Sham and Nani Menon

Universiti Putra Malaysia (UPM), Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, 43400 Serdang, Selangor, Malaysia

Organophosphate insecticide (OPs), that is used extensively in agriculture throughout the world has been linked to neurodevelopmental deficit specifically the cognitive effect. The aim of the study was to determine the relationship between organophosphates insecticide exposure with the general intelligence of the study group. A comparative cross-sectional study was conducted on 227 of primary school children, selected as study group as their school and homes were located less than 100 m from the paddy fields and 162 of primary school children located further away at more than 1 km from agriculture site served as the comparative group. Their parents completed the questionnaire used to collect their background information. The children's capillary blood were collected using the finger prick technique. The blood cholinesterase levels were determined using the cholinesterase test kit LOVIBOND 412870 AF287. The McCarthy Scales of Children's Abilities (MSCA) general cognitive scale was used to determine the general intelligence of these children. Results showed that there were significant difference ($p < 0.05$) in blood cholinesterase and general intelligence between the 2 groups. There were significant relationships between blood cholinesterase levels with the general intelligence scales ($p < 0.001$). The distance from the house to paddy field ($p < 0.001$) as well as gender (male) ($p = 0.004$) significantly influenced with blood cholinesterase levels of the study group. The general intelligence of the study group was lower than the comparative group. The boys were frequent exposure to pesticides due to their home proximity and more frequent outdoor activities near the paddy fields which contributed to the low blood cholinesterase. These then resulted in impaired general intelligence.

KEYWORD

Organophosphate, Intelligence, Cholinesterase.

AUTHOR

1. Mr. Nurul Husna Miswon, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
- 2*. Prof. Zailina Hashim, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
3. Mr. Hayati Kadir Shahar, Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
4. Mr. Nur Naqibah Lokhman, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
5. Mr. Shaharudin Mohd. Sham, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
6. Mr. Nani Menon, FACE, Faculty of Human Ecology, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.

Exposure to Groundwater Nitrate in Intensive Agriculture Area, Kelantan, Malaysia

Aida Soraya S., Sharifah Norkhadijah S.I., Emilia Z.A., Ho Y.B. and J. Hafizan

Universiti Putra Malaysia (UPM), Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, 43400 Serdang, Selangor, Malaysia

Groundwater has a significant role as the source of water in Bachok, Kelantan. Groundwater resource is vulnerable to contamination by various anthropogenic activities. Nitrate is one of common groundwater contaminants and the level of nitrate is increased as a result of excrements of livestock, septic tank effluents, nitrogenous fertilizer application, manure applications, municipal and industrial wastewater and sludge disposal. Drinking water containing high levels of nitrate (above 10 mg/L NO₃-N) is associated with various health problems. A total of 256 private well water samples were collected during rainy season (October to December 2014). The groundwater samples were analysed for nitrate and other water quality parameters and assessed by statistical and geostatistical techniques. The potential risk to human health was estimated by using Hazard Quotient (HQ). Nitrate concentrations varied between 0.11 mg/L NO₃-N to 57.23 mg/L NO₃-N and the mean was 9.62 ± 11.25 mg/L NO₃-N. The spatial distribution of nitrate concentrations revealed most of high nitrate concentrations were measured in the paddy field. The health risk analysis indicates 6 sampling points with HQ > 1, located in the paddy field area. However, mostly all hazard quotient calculated showed no health hazard of nitrate in the study area.

KEYWORD

Nitrate, Drinking water, Groundwater, Spatial distribution, Health risks.

AUTHOR

1. Mr. Aida Soraya Shamsuddin, Postgraduate Student, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia.
- 2*. Mr. Sharifah Norkhadijah Syed Ismail, Lecturer, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia.
3. Mr. Emilia Zainal Abidin, Lecturer, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia.
4. Mr. Ho Yu Bin, Lecturer, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia.
5. Mr. Hafizan Juahir, Lecturer, East Coast Environmental Research Institute (ESERI), Universiti Sultan Zainal Abidin (UniSZA), Gong Badak Campus, 21300 Kuala Terengganu, Terengganu, Malaysia.

The Disparities of Environmental Health Awareness Among Rural-Urban Community in Klang Valley, Malaysia

Nural Farah Ain Binti Mohd Zainuddin and Vivien How

Universiti Putra Malaysia (UPM), Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, 43400 Serdang, Selangor, Malaysia

Environmental health awareness programmes are frequently focused among the urban residents than the rural residents, making these community experience disparities across a significant number of health status measures and health outcomes. To determine the environmental health awareness level and examine the contributing factors of the disparities among rural and urban community. This cross-sectional pilot study recruited 60 rural and 60 urban residents through simple random sampling around Klang Valley. A validated questionnaire which consists of 2 sections : Section A (socio-demographic background) and section B (Comprehensive Environmental Health Checklist) were used as the assessment tool. Urban community has significance higher awareness score as compared to rural community ($p < 0.05$). While examining the potential contributing factors that causes disparities of awareness levels, 41.1% of the variation in the environmental awareness among urban residents are due to their education level, duration of stays in Klang Valley and household income, whereas; age, educational level and household income contribute to atleast 53.6% of the variation of environmental health awareness among rural residents. The provision of accurate and timely information about environmental health to both rural and urban residents will translate into beneficial practices of self-coping capacity and become resourceful in tackling environmental health hazards in their living environments.

KEYWORD

Environmental health, Awareness, Disparities, Rural, Urban.

AUTHOR

1. Mr. Nural Farah Ain Binti Mohd. Zainuddin, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia.

2*. Dr. Vivien How, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia.

A Review on Pesticides Occurrence in Fruits and Vegetables in Malaysia and Their Potential Health Risk Among Adults

Siti Zulfa Zaidon, Hazwanee Hamsan and Ho Yu Bin

Universiti Putra Malaysia (UPM), Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, 43400 Serdang, Selangor, Malaysia

This study was conducted to review the occurrence of pesticide residues in fruits and vegetables in Malaysia and to estimate the health risk upon their consumption among adults. Data from several multi residue analytical studies in Malaysia from 2007 to 2014 were collected and analyzed and the reference dose (RfD) of all the compounds were obtained from the European Union (EU) Pesticide Database. Types of pesticides studied were endosulphan, L-cyhalothrin, cyfluthrin, cypermethrin, deltamethrin, chlorpyrifos, diazinon, malathion, triazophos and quinalphos. Health risk assessments were calculated based on the routes of exposure of pesticides through ingestion and the non-carcinogenic health risk was measured by calculating the value of hazard quotient (HQ). Then, the hazard quotient was summed up to obtained the hazard index (HI) of the cumulative pesticides in each sample. Pesticide residues in fruits and vegetables were ranged from 2.2E-4 mg/kg to 2.7 mg/kg. However, the reported concentrations of pesticide residues were below the maximum residual limit (MRL) set by European Commission. 30% of the pesticide residues exceeded their EU-MRL and the calculated hazard quotient for all compounds in the fruits and vegetables shows no significant non-carcinogenic health risk to human.

KEYWORD

Health risk, Pesticides, Fruits and vegetables, Hazard quotient (HQ), Hazard index (HI), Reference dose (RfD).

AUTHOR

1. Mr. Siti Zulfa Zaidon, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia.
2. Mr. Hazwanee Hamsan, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia.
- 3*. Dr. Ho Yu Bin, Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), 43400 Serdang, Selangor, Malaysia.

Evaluation of Physico-Chemical Properties of Ground Water in Angul-Talcher Industrial Zone of Odisha

Basanta Kumar Sahu and Sarita Dehury

Forest and Environment Department, Government of Odisha, Bhubaneswar-751 001

As surface water near industrial centers and urban areas become increasingly polluted and costly to purify, public water utilities and other water users have turned to ground water as a potential source of cheap and safe supply. Normally, the ground water is believed to be free from contamination and considered safe. But contrary to it, ground water is also contaminated at some places due to various reasons. A study was taken up for physico-chemical analysis of groundwater samples collected from 6 locations in Angul-Talcher industrial zone of Odisha in summer, rainy and winter seasons to know the status, seasonal variation and its suitability for drinking purposes in respect of 20 different water quality parameters. It reveals that 8 parameters, namely pH, BOD, COD, CaH, Cl, SO₄, PO₄ and NO₃ were found to be within the desirable limit for drinking water in all the water samples analyzed. There is no recommended limit for suspended solid (SS), acidity and nitrite for drinking water. In case of other parameters, such as total dissolved solids (TDS), conductivity, turbidity, Mg-H, total hardness, total alkalinity, dissolved oxygen (DO), F and K, the values were at times fluctuated beyond the desirable limit across sampling stations and seasons.

KEYWORD

Ground water, Water quality parameters, Physico-chemical properties.

AUHTHOR

1*. Dr. Basanta Kumar Sahu, Junior Scientist, Forest and Environment Department, Secretariat, Government of Odisha, Bhubaneswar– 751 001.

2. Mrs. Sarita Dehury, Research Scholar, Department of Mathematics, Berhampur University, Bhanja Bihar, Berhampur -760 007.

Assessment of Heavy Metals in the Water Samples Collected From Lonar Crater, Maharashtra

Jaysing M. Dinore, Vinayak B. Suradkar, Vidya Pradhan and Mazahar Farooqui

Dr. Rafiq Zakaria College for Women, Department of Chemistry, Aurangabad - 431 001

Water quality is one of the most important concerns. This study was design to determine the level of heavy metal contamination in Lonar Lake. It is Asia's only magnificent crater formed by hyper velocity meteorite impact. In this study we made an attempt to know the concentration of 6 heavy metals in water of different locations of Lonar Crater Buldana district, Maharashtra upto ppb levels. For this study 10 samples from different sites of lake were selected and then preserved it by adding 2-3 drops of nitric acid, in December 2015. These samples were subjected to analysis for 6 elements like Cd, Pb, Cr, Cu, Zn and Fe by using atomic absorption spectroscopy (AAS). The concentrations of these metals in the study area were compared with drinking water quality limits given by the World Health Organization (WHO), 4th edition in 2011.

KEYWORD

Heavy metals, Water quality, Atomic absorption spectroscopy (AAS), Zinc, Cadmium, WHO.

AUTHOR

1. Mr. Jaysing M. Dinore, Assistant Professor, Indraaj Arts and Science College, Sillod, Aurangabad.
2. Mr. Vinayak B. Suradkar, Post Graduate and Research Centre, Maulana Azad College, Aurangabad.
3. Dr. Vidya Pradhan, Associate Professor, Dr. Rafiq Zakaria College for Women, Aurangabad.
- 4*. Dr. Mazahar Farooki, Associate Professor and Head, Department of Chemistry, Dr. Rafiq Zakaria College for Women, Aurangabad and Incharge, Post Graduate and Research Centre, Maulana Azad College, Aurangabad.

Determination of Radium Isotopes (^{226}Ra and ^{228}Ra) in Water Treatment Units in Riyadh City and the Corresponding Radiation Dose

A. Al-Muqrin and H. Al-Ghamdi

Princess Nourah University, Physics Department, College of Science, Riyadh 11671 , Kingdom of Saudi Arabia

In this study, we have carried out a survey of ^{226}Ra and ^{228}Ra activity concentrations in the final product of the main water treatment units in different districts in Riyadh city of Kingdom of Saudi Arabia to draw a general picture of radium activity levels in drinking waters from these units and to assess the annual effective dose received by public due to the consumption of these waters in drinking and cooking. Radium isotopes (^{226}Ra and ^{228}Ra) were analyzed in water samples using high purity germanium detector, after radiochemical separation of the isotopes and the average activity concentration of ^{228}Ra in Nozha and Eraja districts were found to be in violation of the Saudi Arabian Standards Organization authorized limit for ^{228}Ra of 2.7 pCi/L. The corresponding annual effective dose were 0.17 and 0.19 mSv/y, respectively, which exceeded the 0.1 mSv/y limit allowed by WHO in drinking water. The study shows that it may not be radiologically safe to consume water from the water treatment units in those 2 districts, in view of the fact that measurements of natural radioactivity in drinking water is performed mostly for assessment of the doses and risk resulting from consuming water. It is, therefore, recommended that appropriate measures including uranium isotopes and ^{210}Pb should be made and also such study should be routinely carried out atleast biannually as a check.

KEYWORD

^{226}Ra , ^{228}Ra , Water treatment units, Riyadh, Gamma spectrometry, Annual effective dose.

Environmental Performance Evaluation of Sponge Iron Industries in India- An Overview

Nupur Sengupta, Sarbani Mitra and K.M. Agrawal

Indian Institute of Social Welfare and Business Management, Kolkata - 700 073

The direct reduced iron (DRI) production in India deserves special attention not only because the country is the largest producer of direct reduced iron but also because production is primarily coal based, whereas more than 90% of the global direct reduced iron plants use natural gas. It is observed that in recent times more than 80% of the total production in India is from coal based process, which poses a great challenge as far as compliance with environmental norms is concerned. Accordingly, the present study attempts to explore various environmental issues related to coal based direct reduced iron plant alongwith resource consumption and waste generation scenario. Environmental issues related to coal based direct reduced iron kilns are primarily air emissions and solid wastes generation. Though direct reduced iron kiln does not generate significant amount of liquid effluent, but inefficient use of water resources especially ground water in water scarce areas may lead to depletion of ground water resources. Another environmental issue of direct reduced iron kiln is the high greenhouse gases (GHGs) generation potential. A review of the resource utilisation and waste generation potential of direct reduced iron plant reveals that the specific raw material consumption of iron ore is 1.6 tonne/tonne direct reduced iron, coal is 1.2 tonne/tonne direct reduced iron and dolomite is 0.05 tonne/tonne direct reduced iron. The power consumption ranges from 45-130 Kw/tonne direct reduced iron. The amount of char generation on an average is 0.35 tonne/tonne of direct reduced iron and electrostatic precipitator dust is 0.16 tonne/tonne direct reduced iron. Accordingly, to improve the environmental performance of direct reduced iron plant and reduce the cost of production, there is an urgent need to introduce innovative, eco-friendly and energy efficient technologies for the sustainable growth of the direct reduced iron industry in India.

KEYWORD

Environmental performance, Sustainable development, Sponge iron.

AUTHOR

1. Ms. Nupur Sengupta, Environmental Engineer, West Bengal Pollution Control Board, Kolkata and Research Scholar, Department of Business Administration, University of Calcutta, Kolkata.

2. Dr. Sarbani Mitra, Associate Professor (Environment Management) and Head Fire Safety Management, Indian Institute of Social Welfare and Business Management, Management House, College Square West, Kolkata-700 073.

3*. Dr. K.M. Agrawal, Professor (Environment Management) and Dean, Indian Institute of Social Welfare and Business Management, Management House, College Square West, Kolkata 700 073.