
Indoor Pollution and Human Health

Mrs Ranjit Kaur

Assist Prof. Home Science G.G.S.Khalsa College for Women Jhar Sahib Samrala
Ludhiana India

ABSTRACT

Indoor air pollution is a serious health threat to human being. Around 50% of people in the developing countries depend upon the biomass in the form of wood, dung and crop residue for domestic energy. These materials are typically burns in simple stoves and chullas with very incomplete combustion, which will lead to many diseases like respiratory diseases, cardiovascular diseases, cancer, asthma, depression etc. the studies showed that indoor pollution is more harmful than outdoor pollution. The present paper discussed about the reduction of indoor air pollution by go green, providing improved technology for biomass burning, proper ventilation in houses, invest in air cleaner at homes.

Key words: indoor pollution, diseases, biomass fuel,

I. INTRODUCTION

Indoor air pollution is the term used to describe the amount of contaminants in the air inside a building from sources such as cigarette, fuel combustion for heating or cooking , certain wallboards , carpets of insulation as well as the geology of the area (radon in soil or rocks beneath the structure). The burning of solid fuels for house hold cooking, heating and lighting is a major cause of household or indoor pollution. Indoor air pollution is the degradation of indoor air quality by harmful chemicals and other materials; it can be up to 10 times worse than outdoor air pollution. The indoor air levels of many pollutants may be 2-10 times higher than outdoor levels. These levels of indoor air pollutants are of particular concern because most people spend as much as 90% of their time indoor.

II. DIFFERENT TYPE OF INDOOR POLLUTANTS / SOURCES OF INDOOR POLLUTION

The principal sources of indoor air pollution are: (1)Combustion, building material, and bio aerosols.(2) While radon, asbestos, pesticides, heavy metals, volatile organic matter, and environmental tobacco smoke are considered major indoor pollutants in developed countries, the combustion products of biomass fuels contribute most to indoor air pollution in developing nations

Paints and strippers: Latex paints are a big improvement over oil-based paints because they emit fewer chemical fumes. But as they dry, all paints can emit VOCs, which can cause headaches, nausea, or dizziness. Paint strippers, adhesive removers, and aerosol spray paints can also contain ethylene chloride, which is known to cause cancer in animals.

Heating equipment (stoves, heaters, fireplaces, chimneys): Heating equipment, especially gas stoves, can produce carbon monoxide, which can cause headaches, dizziness, fatigue, and even death if not ventilated properly. It can also emit nitrogen dioxide and particulates, which can cause respiratory problems and eye, nose, and throat inflammation

New electronics and other plastic products: Products made with polyvinyl chloride can emit phthalates, which have been linked to hormonal abnormalities and reproductive problems. Plastics can also release flame-retardant chemicals, such as poly brominated biphenyl ethers, which have been linked to neurobehavioral changes in animal studies.

Biological pollutants: It includes pollen from plants, mite, hair from pets, fungi, parasites and some bacteria. Most of them are allergens and can cause asthma, hay fever and other allergic diseases.

III. EFFECT OF INDOOR POLLUTION ON HUMAN HEALTH

Polluted indoor air can contribute to a variety of health problems ranging from asthma to heart diseases to cancer. Mould has been linked to allergies, skin rashes, respiratory illness including asthma and other health

problems. Radon is a leading cause of cancer. Second hand smoke has been shown to increase risk of asthma, emphysema, chronic bronchitis, heart diseases and cancer.

The indoor environment also reflects outdoor air quality and pollution. Outdoor pollution primarily results from the combustion of fossil fuels by industrial plants and vehicles. This releases carbon monoxide, sulphur dioxide, particulate matter, nitrogen oxides, hydrocarbons and other pollutants. The characteristics of emissions and solid waste disposal may vary for each specific industry (e.g. smelting, paper production, refining and others).

Girls are at most risk as they are often requested to help their mothers with household chores. Infants are exposed to pollutants when carried on the backs of their mothers as they tend fires. Irritation that would not affect adults may result in severe obstruction or damage to children's lungs because they are more vulnerable.

According to **World Health Organization** In 2012, indoor air pollution was linked to 4.3 million deaths globally, compared with 3.7 million for outdoor air pollution.

According to **M.Sreelata (2012)** indoor air pollution caused by cooking with biomass fuel could be a risk factor in depression among women in their child bearing years. A women who cooks with biomass inhales carcinogens equivalent to smoking two packs of cigarettes a day. .Ray told in SciDev.Net.

In air-conditioned buildings indoor air quality is dependent on the efficiency of air-conditioning and humidifier systems since these systems provide a suitable environment for the proliferation of microorganisms. Bio aerosols may spread in the indoor environment through the air-conditioning system. Humidifier fever/hypersensitivity pneumonia is a disease with symptoms of hypersensitivity pneumonitis related to bacterial end toxins, fungi and amoebae found in humidifier reservoirs, air conditioners and aquaria. Disease is characterized by fever, headache, chills, malign and malaise. It normally subsides within 24 hours without residual effects. Humidifier lung disease with cough, fever, myalgia was described as a result of inhaling end toxin present in the humidifier water.

According to **Kounteya Sinha(2007)** indoor air pollution resulting from chullas burning wood , coal and animal dung as fuel is claiming shocking 500,000 lives in India every year, most of them are children and women.

Exposure to carbon monoxide reduces the blood's ability to carry oxygen. The chemical is odourless and some of the symptoms of exposure are similar to those of common illnesses. This is particularly dangerous because carbon monoxide's deadly effects may not be recognized until it is too late to take action. Exposure to carbon monoxide is particularly dangerous to unborn babies, infants and people with anaemia or a history of heart disease. Breathing low levels of the chemical can cause fatigue and increase chest pain in people with chronic heart disease. Breathing higher levels of carbon monoxide causes symptoms such as headaches, dizziness and weakness in healthy people. Carbon monoxide also causes sleepiness, nausea, vomiting, confusion and disorientation. At very high levels it causes loss of consciousness and death.

IV. HOW TO PREVENT INDOOR POLLUTION: A wide range of preventions are available to reduce indoor pollution. Interventions can be classified according to following points.

1. Go green: indoor plants can help to clean air. A two year NASA research project showed that plants and even microorganisms in soil will help to reduce indoor air pollutants. Some of the plants are the best for improving the indoor air quality. English ivy, spider plants, peace lily, elephant ear philodendron, weeping fig, snake plants bamboo or reed plant etc. some other plants also help to reduce indoor pollution in urban areas.

a. Aloe Vera: This purifying plant from South Africa is shown to clear the air of benzene and formaldehyde, both known human carcinogens. Unlike most plants, aloe actually releases oxygen and absorbs carbon dioxide at night, making it ideal for bedrooms. Aloe gel is also medicinal, used externally to treat burns and internally for numerous ailments. It is a sun-loving plant; beware of overwatering it.

b. Areca Palm: This palm, native to Madagascar, is among the best plants for removing a variety of toxins, especially formaldehyde. It likes bright, indirect light. Because of a high transpiration rate, it adds a lot of humidity to the air and needs to be watered regularly. This plant does not tolerate neglect; its tips will turn brown when moisture, light, temperature and fertilizer levels are not ideal.

c. Dracaena ‘Janet Craig’: This is one of the best plants for clearing formaldehyde and trichloroethylene. Although native to tropical Africa, this plant adapts well to indoor environments and can even endure some neglect. It likes moderate to bright indirect light. Water after the soil begins to dry out, and use a pot with drainage holes to avoid soggy soil.

d. Dragon Tree: Native to Madagascar, this tree can grow up to 6 feet tall and is among the best plants for removing xylene, trichloroethylene and toluene (the latter is a solvent and additive to gasoline). This is another one of many houseplants belonging to the Dracaena genus and comes in four main varieties. It likes moist soil at all times, but not soggy soil. Keep the plant in semi shade, and avoid strong, direct light.

2. Test for radon: radon is the radioactive gas released from the soil. It enters in the homes through cracks in walls and door close to soils because air pressure inside the home is always lower than outside.

3. Push stale air out: Use exhaust fans to keep to help push out indoor air. Install and use vent fans in bathrooms, kitchens and laundry rooms. Open the vent controls on air-conditions.

4. Providing improved technology: Government should provide improved technology for biomass burning. A more systematic approach to the development and evaluation of interventions is desirable, With cleaner recognition of interrelationship between the poverty and dependence on polluting fuels.

V. CONCLUSION

It is always better to prevent rather than treat illness. To avoid problems due to indoor air quality, the first approach is source reduction and elimination, and the second, proper ventilation and maintenance of gas, oil and solid fuel cooking, heating and cooling systems, Improving technology for biomass burning stoves. Air cleaning is the least effective, and most expensive. Air fresheners, which contain untested potentially harmful volatile organic compounds (VOCs), should not be used to cover up stale air or unpleasant smells.

Although there is a measures to keep healthy indoor air we breathe include: introduction and distribution of adequate ventilation air; control of airborne contaminants; maintenance of acceptable temperature and relative Humidity. This also includes a special attention to moisture control. Many types of adjustments could improve environmental conditions. For instance, open windows improve air flow, minimizing the temperature decreases the growth of moulds, and restricted use of colognes or perfumed

VI. REFERENCES

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