

Editorial

Wood stoves: a source of enjoyment and a potential hazard

Fogão a lenha: um passatempo agradável, uma rotina perigosa

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The advantages of wood stoves are countless: wood is easily obtained; a wood stove warms the home, gathering the family in cold evenings; and, finally, they are famous for giving food a better flavor. Cooking is a source of enjoyment for many and even a passion for some. However, according to the World Health Organization (WHO), more than three billion people worldwide depend on solid fuels, including wood, coal, charcoal and organic remains, to stoke the fires used in everyday tasks, such as cooking, boiling water and heating their environment.⁽¹⁾ In Brazil, high costs and limited access to gas canisters force those in the lower socioeconomic strata to use primitive wood stoves that are not energy-efficient and release smoke into the environment. Data from the National Energy Bulletin, published by the Brazilian Ministry of Mining and Energy in 2006, show that wood is the main source of energy consumed in Brazilian homes, accounting for up to 37.5% of the total consumption.⁽²⁾ Additional sources of energy include electricity (33.4%) and liquefied petroleum gas (25.5%). Wood stoves are frequently used as a complement to stoves that burn cooking gas.

The incomplete combustion of solid fuels within homes, whether in open fires or in traditional wood stoves, constitutes a source of indoor pollution, resulting in the release of a dangerous mixture composed of thousands of substances. Many of those substances are hazardous to human health, the most relevant being particulate matter, carbon monoxide, nitrous oxide, sulfuric oxides, formaldehyde, hydrocarbons and polycyclic organic material, including carcinogenic agents such as benzopyrene.⁽³⁾ As a rule, high emission of pollutants, due to incomplete combustion, goes hand in hand with inadequate ventilation of the environment, and, consequently, the levels of household pollution in such homes are quite high. Such levels can be ten, twenty or even many more times higher than the standard set by the U.S. Environmental Protection Agency: annual mean of particulate matter < 10 microns in diameter in the environment (50 µg/m³), as well as than that established by the European Union (40 µg/m³).⁽⁴⁾ The health consequences of such exposure depend not only on the pollution level but also, and principally, on the amount of time individuals spend breathing polluted air. In developing countries, individuals are exposed to high levels of

pollution for prolonged periods of time, from 3 to 7 h/day for many years.⁽⁵⁾ Women, children, elderly and sick individuals are the ones who remain in polluted environments for longer periods. Since cooking is an activity that occurs each day of the year and occupies many hours of the day, exposure is persistent and prolonged.

Data from the WHO show that household pollution caused by solid fuel burning is one of the most relevant risks for health worldwide.⁽⁴⁾ In 2002, 1.5 million people died due to diseases associated with household pollution.⁽⁴⁾ Most studies on the association between household pollution and adverse health effects have been observational, and the intensity of exposure was not evaluated in detail; however, there is evidence that such exposure has a cause-and-effect relationship with acute respiratory infections in children younger than 5 years of age, as well as with chronic bronchitis and chronic obstructive pulmonary disease (COPD).⁽⁵⁾ Nevertheless, there is little evidence of such an association with cataracts, otitis media, lung cancer, larynx cancer, asthma exacerbations, pulmonary tuberculosis, low birth weight and higher infant mortality rates.⁽⁵⁾

Treatment guidelines recognize that household pollution is a risk factor for the development of COPD.^(6,7) However, the number of Brazilian studies evaluating the influence of this risk factor for the disease is small, and the results are inconclusive.^(8,9) In the current issue of the Brazilian Journal of Pulmonology, Moreira et al.⁽¹⁰⁾ publish a study in which respiratory symptoms and pulmonary function alterations of 170 patients with COPD were evaluated. Of those 170 patients, 34 had been exposed to wood smoke alone, 59 had been exposed to tobacco smoke alone, and 77 had been exposed to both agents. The results showed no differences in symptoms among the groups. However, those exposed to wood smoke presented less impairment of pulmonary function when compared with those exposed to both agents or to tobacco smoke alone. In addition, the percentage of patients with severe or extremely severe disease was lower in the group exposed only to biomass smoke when compared to those exposed exclusively to tobacco smoke (11.8% vs. 44.1%). The limitations of the Moreira et al. study are similar to those in the literature on the subject, including nonsystematic evaluation of the exposure, the observational design and, specifically in this

study, the retrospective character. Nevertheless, the study showed that the absolute majority of the study sample (80%) had a history of exposure to household pollution caused by wood burning > 80 hour-years. This finding reveals the importance of the systematic evaluation of exposure to the agent, even among smokers, so that patients with COPD are instructed to completely eliminate all risk factors during their treatment. In Brazil, data corroborating the association between adverse health effects and exposure to the products of wood burning might promote the implementation of the use of ecological stoves and, therefore, the prevention of COPD. However, nothing prevents those who love cooking with modern wood stoves from enjoying this activity, since there is as yet no evidence of an association between occasional exposure and adverse health effects.

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