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Air pollution and obesity: Myth or fact

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Abstract

Obesity has become a major epidemic in the United States and other developed countries. Usually defined by a Body mass Index (BMI) of 30 or greater, obesity has been shown to pose major health risks including cardiovascular disease and cancer. While on the basest level, obesity results from taking in more calories than are expected over a long period of time, studies also show that the problem is much more complex than that. Genetics, lifestyle choices, chronic disease, and environment all play key roles in the propensity of obesity. Medical research has continually supported that exposure to fine particulate matter in the air increases the risk of several respiratory and cardiovascular diseases. The correlation between air pollution and these disorders is particularly noticeable in children, low income communities, and areas that are close to sources of air pollution. Recently, particulates have been linked to other inflammatory processes, including type 2 diabetes mellitus. Diabetes and its accompanying epidemic of obesity are two of the most persistent and expensive health problems in modern developed countries. This talk outlines the relationship between different types of air pollution and their possible link to the obesity epidemic in the Western world. Chinese air pollution is obviously increasing, and the government makes efforts to strengthen air pollution treatment. Although adverse health effects gradually emerge, research determining individual vulnerability is limited. This study estimated the relationship between air pollution and obesity. Individual information of 13,414 respondents from 125 cities is used in the analysis. This study employs ordinary least squares (OLS) and multinomial legit model (m-legit) to estimate the impact of air pollution on obesity. We choose different air pollution and Body Mass Index (BMI) indicators for estimation. Empirical results show Air Quality Index (AQI) is significantly positively associated with the BMI score. As AQI adds one unit, the BMI score increases 0.031 (SE = 0.002; $p < 0.001$). The influence coefficients of particle size smaller than 2.5 μm ($PM_{2.5}$), particle size smaller than 10 μm (PM_{10}), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and sulphur dioxide (SO_2) to the BMI score are 0.034 (SE = 0.002; $p < 0.001$), 0.023 (SE = 0.001; $p < 0.001$), 0.52 (SE = 0.095; $p < 0.001$), 0.045 (SE = 0.004; $p < 0.001$), 0.021 (SE = 0.002; $p < 0.001$), 0.008 (SE = 0.003; $p = 0.015$), respectively. Generally, air pollution has an adverse effect on body weight. CO is the most influential pollutant, and female, middle-aged, and low-education populations are more severely affected. The results confirm that the adverse health effects of air pollution should be considered when making the air pollution policies. Findings also provide justification for health interventions, especially for people with obesity.

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