

Exposure to industrial air pollutants and respiratory health school and home exposure among primary school children in Kemaman, Terengganu

ABSTRACT

Exposure to air pollution leads to a wide range of acute and chronic airways effects. Compared adults, children are particularly at risk due to the immaturity of their respiratory organ systems. This study is intended to determine the exposure of Industrial Air Pollutants (PM₁₀, PM_{2.5}, NO₂, SO₂ and VOCs) and its association with respiratory symptoms among Primary School Children in industrial and non-industrial area at Kemaman, Terengganu. A cross-sectional comparative study was carried out among Malay primary school children in Kemaman, Terengganu. A standardized set of questionnaire are adapted from the American Thoracic Society (ATS) and International Study of Asthma and Allergies in Childhood (ISAAC) questionnaire were used to obtain the background information, exposure history and respiratory symptoms of the respondents. Indoor air quality assessments were conducted in each primary school and homes using several indoor air monitoring instruments includes Dust Trak DRX Aerosol Monitor 8534, Air Sampling Pump, PbbRAE Portable VOC Monitor (pbbRAE 3000), LaMotte Air Sampling Pump, Q-TrakPlus Model 8554 Monitor and TSI VelocicalcPlus Model 8386. The median and interquartile range of concentration of PM₁₀, PM_{2.5}, NO₂, SO₂ and VOCs in classrooms and homes of exposed group was higher than the values in comparative group at $p < 0.001$. Respiratory symptoms show a significant difference between exposed and comparative group at $p < 0.001$. The reported respiratory symptoms were based on the questionnaire that fulfill by their parents. Data collected was analyzed using Statistical Package for Science (SPSS) Version 21. This study showed that the exposure to industrial air pollutants increased the risk of getting respiratory tract symptoms among primary school children living near industry area.

Keyword: Industrial air pollutants; PM₁₀; PM_{2.5}; NO₂; SO₂; VOCs; Primary school children; Respiratory symptoms