

Industrial air pollutants and its association with respiratory health (lung function test) among primary school children in Kemaman, Terengganu

ABSTRACT

There are an extensive evidence that air pollutants that comes from industrial areas do have an adverse effects on the respiratory health of the children. 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 health among primary school children in industrial and non-industrial area at Kemaman, Terengganu. A crosssectional 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. Indoor air quality assessments were conducted in each primary school and homes using several indoor air monitoring instruments. MM-SP004 tabletop portable spirometers were used to conduct a lung function test among the children. There were significant associations between PM₁₀ with FVC% and FEV1% (PR = 6.77, 95%CI= 1.52-30.13) and (PR = 6.10, 95% CI = 1.75-21.00), PM_{2.5}with FEV1% (PR = 3.13, 95% CI= 1.20-8.21), NO₂with FVC% and FEV1% (PR = 5.54, 95% CI = 1.24-24.70) and (PR = 4.94, 95% CI= 1.42-17.10) and SO₂ with FVC% and FEV1 % (PR =10.00, 95%CI= 2.25-44.52) and (PR = 6.35, 95% CI= 2.10-19.30). Results also reveal that FVC (Liter), FEV1 % and FEV1/FVC % were significantly lower among the exposed group compared to the comparative group (Z = -2.43, p < 0.05), (Z = -4.43, p < 0.05) and (Z = -4.80, p < 0.05). The findings showed that exposures to industrial air pollutants might increase the risk of getting lung function abnormality and respiratory illness among study respondents.

Keyword: Industrial air pollutants; Respiratory health; Lung function test; Primary school Children; Kemaman; Terengganu