

## **PM2.5 & UFP exposure and its association with respiratory health illness among photocopy workers in Selangor**

### **ABSTRACT**

**Objective:** To investigate the relationship between exposure to PM2.5 and ultrafine particle (UFP) with respiratory health illness among photocopy workers in Selangor. **Method:** This cross-sectional comparative study involved sixty workers where 30 photocopy workers as exposed group and 30 administrative staffs as comparative group. Questionnaire adapted from American Thoracic Society (ATS) was used to assess respiratory symptoms. Lung function test was conducted for each respondent to assess lung function status. Measurement of PM2.5 and ultrafine particle was performed to obtain exposure level the respondents. **Result:** Mean personal exposure to PM2.5 (62.30  $\mu\text{g}/\text{m}^3$ ) was 5 times higher and UFP (14567.10 pt/cc) was 4 times higher in exposed group than comparative group (PM2.5= 13.10  $\mu\text{g}/\text{m}^3$ , UFP= 3662.60 pt/cc). Reported respiratory symptoms of cough (26.7%), phlegm (16.7%), chest tightness (3.3%), and wheezing (6.7%) were much higher in exposed group compared to comparative group. There was a significant association between personal exposure to PM2.5 with lung function of FVC % predicted ( $r = -0.404$ ,  $p = 0.027$ ) and UFP with lung function of FEV1 % predicted ( $r = 0.377$ ,  $p = 0.040$ ). The continuous exposure to PM2.5 and UFP among photocopy workers can cause lung function impairment as current study findings also showed that respiratory symptoms was higher among exposed group compared to the comparative group and there was a significant association between personal exposures to PM2.5 and UFP with lung function among exposed group. **Conclusion** The photocopy owner should control the emission and exposure to PM2.5 and UFP by regularly serviced or maintenance the photocopy machine and improve indoor environment by ensures good ventilation.

**Keyword:** Photocopiers; PM2.5; UFP