

APHA 250 words: Environment Section (Building Healthy and Resilient Communities)

The impact of working from home during COVID-19 pandemic on employee's health: implication of indoor air quality

248 words

Background: Indoor air quality (IAQ) has a significant impact on human health. Since the COVID-19 pandemic began, more employees work remotely from home to reduce in-person contacts. This study aims to measure the difference in indoor air quality between the office and household environments and its impact on employees' health.

Methods: This was a pilot study conducted in McAllen, Texas, in two settings; 1) offices during January-July 2019 (pre-COVID-19) and 2) households during June-October 2020. Eleven employees working in an academic organization participated in this study. The levels of 2.5 μm particulate matter (PM_{2.5}), total volatile organic chemicals (tVOC), and CO₂ were monitored in offices and households at multiple locations for a month. The frequencies of 6 symptoms of the Sick Building Syndrome (e.g., dry eyes) were evaluated at each period of monitoring.

Results: In 82% of participants, the PM_{2.5} levels in households were significantly higher than those in offices ($p < 0.05$). All households showed PM_{2.5} levels greater than the annual mean standard (10 $\mu\text{g}/\text{m}^3$), while 82% of offices showed levels in compliance with it. The tVOC and CO₂ levels were all below the guideline. Among 9 subjects who completed both health surveys, 7 subjects reported the changes in health outcomes in accordance with different PM_{2.5} levels between those 2 periods.

Conclusions: This study showed that working from home during the pandemic may pose more health concerns for employees due to the poor indoor air quality. The interventions to improve the home IAQ and health outcomes should be considered.

Learning objectives (2)

- To compare the indoor air pollution between the office and household environment.
- To evaluate the change of health impacts of working from home during COVID-19 pandemic.

Keywords: Indoor air quality, COVID-19, work from home, employee health.