

INDOOR ENVIRONMENTAL QUALITY AND SICK BUILDING SYNDROME IN APARTMENT BUILDINGS

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The urbanization of Sri Lanka has resulted in an increase in apartment construction due to escalated prices and scarcity of buildable land. These building occupants spend most of their time indoors and the situation is further aggravated with the pandemic, during which the government and many private organizations have permitted their employees the luxury of 'working from home' with online facilities. The compact floor plan and controlled ventilation in most of the apartments resulted in Sick Building Syndrome (SBS) as a stumbling block for liveability. This study demonstrates the method of measuring and analysing the apartments for several Indoor Environmental Quality (IEQ) parameters. Moreover, it measures the components / chemical products which would affect the indoor environment. Finally, its effect on occupants that result in Sick Building Syndrome (SBS).

With the objective of assessing the indoor air quality (IAQ) associated with SBS in Sri Lankan Apartments, a study was conducted in 50 apartments selected from several cities in the Colombo District, Sri Lanka. This study included a field study as well as a questionnaire. The indoor environmental measurements considered were Total Volatile Organic Compound concentration (TVOC concentration), CO₂ concentration, Temperature, Relative Humidity and Noise level. Occupants were requested to fill the questionnaire, which was focused to analyse the building characteristics, indoor chemical usage and SBS symptoms.

The TVOC concentrations were reported to be varying from 0 ppm to 4.5 ppm and 0 to 1.87 ppm in indoor and outdoor, respectively. The CO₂ concentration were found to be ranging from 386ppm to 883ppm. The use of chemicals in the daily routine had resulted in an increased indoor TVOC concentration. Building characteristics such as mechanical ventilation and ability for cross ventilation had a major impact on indoor air pollutant concentration in the apartments. Furthermore, different types of air fresheners were found to be affecting the air quality, especially, the cube type air freshener has caused the highest impact on indoor TVOC concentration out of the varieties considered in the study. TVOC concentrations indicated positive correlations with General symptoms as well as Respiratory symptoms. Furthermore, the provision of good ventilation with proper cross ventilation resulted in better air quality. These new findings on the SBS of apartment buildings in Sri Lanka would assist policy makers, builders, designers, and users of apartment buildings to take urgent measures to reduce the indoor air pollution.

Keywords: SBS causes; air quality, SBS symptoms, indoor temperature, urban apartments

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