ABSTRACT

Indoor air quality is known to cause Sick Building Syndrome (SBS) symptoms in office employees in commercial offices and workplaces, due in part to lower ventilation rates or any other factors that can be unique to a workplace. Few research have been done on residential dwellings and since the use of air-conditioners have become more widespread in Singapore due to the increasing affluence of the people, there is a potential in finding out whether there is a correlation between SBS and the indoor air quality at home, based on a comparison between the use of natural ventilation and air-conditioning while occupants are sleeping in their homes.

An objective analysis was carried out in 3 residential dwellings over 2 consecutive days for each dwelling to find out the indoor air quality of the bedroom that the subjects slept in. It was found that when the subjects used air-conditioners while sleeping in the night, there was a considerable increase in carbon dioxide level (>1000ppm) for the different types of air-conditioners tested. But there was no conclusive evidence that occupants will exhibit SBS symptoms as a result of that increase in carbon dioxide.

In addition, a survey was done to find out whether occupants exhibited signs of SBS symptoms while sleeping in naturally ventilated conditions and where applicable, in air-conditioned environments. A comparison made using the survey results showed that almost all occupants who used air-conditioners while sleeping, will exhibit one or more SBS symptoms and these occupants usually displayed more SBS symptoms after using air-conditioning than when they utilised natural ventilation. It was also interesting to find out that many of the occupants who did not switch on or have air-conditioners also exhibited SBS symptoms when their bedrooms were naturally ventilated while sleeping. The frequency and duration of air-conditioner was found to also affect the likelihood of respondents in getting SBS. It was discovered that respondents who switched on their air-conditioner daily had lesser occurrences of SBS than those who switched on their air-conditioners irregularly.